



APPENDIX O

WETLANDS TECHNICAL REPORT

JUNEAU ACCESS IMPROVEMENTS SUPPLEMENTAL DRAFT ENVIRONMENTAL IMPACT STATEMENT

**STATE PROJECT NUMBER: 71100
FEDERAL PROJECT NUMBER: STP-000S (131)**

Prepared for

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Errata Sheet
Wetlands Technical Report
October 2004

1. Page 2-10, Section 2.4, 1st paragraph. The list of wetlands not identified by the field crew in July 2003 but included in Table 3-2 were delineated by using aerial photography and the Cascade Point Environmental Impact Statement (EIS).
2. Page 2-10, Section 2.4. GIS Mapping and Aerial Interpretation, the last sentence of the first paragraph is amended to read: "Wetlands not identified by the field crew in July 2003, but delineated using aerial photography, are identified in Attachments B-1 and B-2 by the word 'aerial' in the field date column."
3. Attachment B-1, table notes. The note referencing the Katzehin Ferry Terminal should read as follows "Katzehin Ferry Terminal: Impacted Acreage by Alternatives 2, 2A, and 2B = 2.2 acres (2765-1; E2RS2N); 2.9 acres (2745-T E2RS2N,); and 3.2 acres (2750-1; E2EM1N); By Alternative 2C (no ferry terminal, impacts from road only) = 0.3 acre (2765-1; E2RS2N), 0.6 acre (2745-T; E2RS2N) and 0.6 acre (2750-1; E2EM1N)."

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ACRONYMS AND ABBREVIATIONS

AAC	Alaska Administrative Code
ACMP	Alaska Coastal Management Program
Adamus	Adamus Resources Assessment, Inc.
ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
AMHS	Alaska Marine Highway System
ASTM	American Society of Testing and Material
AWQS	Alaska Water Quality Standards
BMP	Best Management Practice
CBJ	City and Borough of Juneau
CFR	Code of Federal Regulations
CWA	Clean Water Act
DEIS	draft environmental impact statement
DMLW	Division of Mining, Land and Water
DOT&PF	(Alaska) Department of Transportation and Public Facilities
EFH	essential fish habitat
EIS	environmental impact statement
FAC	facultative species
FACU	facultative upland
FACW	facultative wetland
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FVF	fast vehicle ferry
GIS	geographic information system
GPS	geographic positioning system
ILMA	Interagency Land Management Agreement
MHW	mean high water
NEPA	National Environmental Policy Act
NMFS	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRCS	National Resources Conservation Service
NTCHS	National Technical Committee for Hydric Soils
NWI	National Wetlands Inventory
OBL	obligate wetland
OHMP	Office of Habitat Management and Permitting
OPMP	Office of Project Management and Permitting
SAMP	special area management plan
SDEIS	Supplemental Draft Environmental Impact Statement
UPL	upland
URS	URS Corporation
U.S.	United States
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Service
WET	Wetland Evaluation Technique

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EXECUTIVE SUMMARY

A Wetlands Technical Report was prepared in 1994 to assess the impacts on wetlands for the 1997 Juneau Access Improvements Draft Environmental Impact Statement (DEIS). Prior to preparation of the 1994 Wetlands Report, Federal and State resource agencies with jurisdiction over or interest in wetlands and special aquatic sites were consulted on the appropriate level of documentation necessary to assess wetlands impacts. It was decided that U.S. Fish and Wildlife Service National Wetland Inventory (NWI) maps were suitable for the analysis with some limited fieldwork during the summer of 1994. Area impacted for each alternative was calculated from the NWI maps. A wetland functional analysis on wetlands complexes was also performed, although there was no field verification.

The 1997 DEIS analysis concluded that the East Lynn Canal EIS-B alignment would have a high impact on wetlands, with fill and/or excavation affecting 52.4 acres of high to moderate valued wetlands. The EIS-A route across the Berners Bay tide flats would impact the same amount of high to moderate valued wetlands plus an additional 85 acres of unvegetated mudflats. The West Lynn Canal alternative was rated as having a low impact on wetlands, with fill and/or excavation affecting 5.7 acres of moderate valued wetlands. High valued wetlands were avoided on this alignment. In the analysis, alternatives improving the Alaska Marine Highway System (AMHS) were all rated as having low impacts on wetlands, with very limited marine fill at the Sawmill Cove Ferry Terminal. The 1997 DEIS rated the East Lynn Canal Highway alternatives as having the greatest impact to wetlands. However, the DEIS also concluded that long-term impacts on overall productivity and other wetland functions would be insignificant.

The Alaska Department of Transportation & Public Facilities (DOT&PF) has modified both the East and West Lynn Canal alternatives evaluated in the 1997 DEIS. Comments received on the 1997 DEIS and 2003 scoping comments indicated the need for a new functions and values analysis. DOT&PF has reassessed the impacts of the proposed project on jurisdictional areas based on the new alignments and agency requests for a new analysis. This document is intended to update and build on the information presented in the DEIS.

The following analysis is based on a substantial amount of new fieldwork and wetland delineations conducted in 2003. The methodology for collecting and analyzing the new data and for assessing the impacts of the 2003 highway alignments on wetlands is described in detail in Chapter 2 of this technical report. This report focuses on the potential direct effects of the alternatives on wetlands and marine waters of the United States (U.S.) and impacts to the functions and values of these areas. Impacts to riverine and subtidal areas are discussed in the *Anadromous and Resident Fish Streams Technical Report* and the *Essential Fish Habitat (EFH) Assessment*. Additional discussions on impacts to wildlife habitat are included in the *Wildlife Technical Report*.

Wetlands were assessed as individual wetlands rather than complexes. Infield wetland assessments were collected at several locations including Berners Bay and the Katzehin River area on the east side of Lynn Canal and William Henry Bay, Endicott River, Sullivan River, the Davidson Glacier area and Pyramid Island on the west side of Lynn Canal.

A modified version of the Adamus Resource Assessment, Inc. (Adamus) Wetland Evaluation Technique (WET) (Adamus, 1987; SWCA Environmental Consultants, 2002) was used to evaluate the wetlands in the project area (Attachment A). The Interagency Working Group of the Juneau Airport Environmental Impact Statement (EIS) revised this primarily freshwater

assessment methodology in order to consider coastal wetlands (SWCA Environmental Consultants, 2002).

For this analysis, the distribution and potential effects on wetland and other marine areas of the U.S. within the project area were divided into four sub-regions for the East Lynn Canal alternatives and three sub-regions for West Lynn Canal, primarily based on geography and components of the project alternatives.

For East Lynn Canal, the sub-region with the greatest amount of wetland coverage extends from Slate Cove on the north side of Berners Bay to Sherman Point, where forested wetlands dominate the land cover. Opportunities to avoid wetlands are very limited. The greatest amount of estuarine emergent wetlands or salt marsh habitats, some of the highest rated wetlands for wildlife habitat functions, are found at the mouths of the Antler and Lace/Berners rivers in Berners Bay and on the Katzeihin outwash plain.

West Lynn Canal, from William Henry Bay to Haines, has a lower density of wetlands in comparison to the southern portions of the East Lynn Canal project area. Forested wetlands are the dominant wetlands type, similar to East Lynn Canal. Estuarine wetlands are primarily found at the mouths of small rivers and the outer fringes of glacial outwash plains and river deltas. The Davidson Glacier outwash plain is different from other sections of this coastline in that it has numerous small, wet depressions that support a diverse range of wetland and open water habitats. Following the field investigation, the highway route was realigned to avoid the majority of these wetlands.

This report analyzes the impacts of nine “build” alternatives. Direct impacts to wetlands or marine areas of the U.S. were determined by overlaying the highway centerline and cut and fill limits on wetland maps developed from NWI maps, by field delineations on rectified air photos, and by air photo interpretation. Areas of wetlands within the project footprints were calculated using ArcView. Indirect and cumulative effects are addressed in the *Indirect and Cumulative Effects Analysis Report*, which is appended to the Juneau Access Improvements Project SDEIS.

Alternative 2 (Preferred) – East Lynn Canal Highway with Katzeihin Ferry Terminal – Alternative 2, which includes a highway from Echo Cove to Skagway, would have the greatest impact on wetlands and marine areas. The alternative would result in the direct loss of 118.6 total acres of wetlands and intertidal marine areas within the footprint of the proposed highway and ferry terminal at Katzeihin. Of this total, 86.9 acres are palustrine wetlands, primarily forested wetlands, 5.5 acres are estuarine emergent wetlands, and 26.2 acres are non-vegetated marine areas, consisting primarily of rocky shores.

Realignment of the route through the head of Berners Bay in October 2003 reduced the amount of wetland fill in the area by approximately 3.1 acres of emergent wetlands, and approximately 2.9 acres of estuarine emergent wetlands (salt marsh). Further realignments were made in November 2003 to avoid all salt marsh habitat, and in December 2003 to avoid intertidal fill.

Impacts to individual wetland functions and values from fill primarily focuses on impacts to forested wetlands, since they make up the largest category of impacted wetlands. Actual impacts are largely based on location, but impacts generally involve reductions of groundwater recharge functions, groundwater discharge/lateral flow functions, surface hydrologic control functions and, if they are close to surface water bodies, riparian support. Forested wetlands are common to the project area in Lynn Canal as well as throughout southeast Alaska. The palustrine emergent and scrub-shrub communities, as well as some of the forested wetlands, are generally associated with muskeg complexes and are also common to the region.

High to moderate-high value wildlife habitat would be modified in the Berners Bay and the Katzeihin River areas. In addition, the Alternative 2 alignment could impact wildlife movement from salt marsh areas to adjacent upland areas. Wildlife habitat and wildlife corridor impacts are discussed in the *Wildlife Technical Report*.

Fill in marine areas would modify fish habitat. Most of the marine waters of Lynn Canal support several life stages of anadromous and marine forage fish species. Specific discussions of the impacts to fish habitat are provided in the *EFH Assessment*.

Alternative 2A – East Lynn Canal Highway with Berners Bay Shuttles – The proposed highway under Alternative 2A takes a similar route to Skagway except Berners Bay is bypassed with the shuttle ferry between Sawmill Cove and Slate Cove. Elimination of this segment of the highway reduces the total wetlands loss by about 24.0 acres, but increases marine fill by 3.0 acres. Estimated total fill area for this route is approximately 100.4 acres, with 71.2 acres of wetlands (mostly forested wetlands) and marine fills totaling approximately 29.2 acres, over 90 percent consisting of rocky shores.

The impacts to wetland functions and values for Alternative 2A are the same as for Alternative 2 with the following exceptions. Impacts of fill on wetlands functions for the Sawmill Cove Ferry Terminal would be primarily to wildlife and fish habitat functions, which are rate as high. Impacts of fill on wetland functions for the Slate Cove Ferry would be also be primarily to wildlife and fish habitat, similar to Sawmill Cove. Impacts of fill on wetland functions for the Sawmill Cove and Slate Cove Ferry Terminal access highways include modification of groundwater recharge functions, groundwater discharge/lateral flow functions, and sediment retention, and riparian support functions.

This alternative does not impact the Berners Bay wetlands with high and moderate-high wildlife habitat values. Sawmill Cove and Slate Cove have high wildlife habitat values. The Alternative 2A alignment does not directly impact the salt marsh wetland; however the highway alignment has the potential to impact terrestrial wildlife movement between the salt marsh area and adjacent uplands. A further discussion of potential wildlife habitat and corridor impacts is included in the *Wildlife Technical Report*.

The placement of fill on intertidal habitat at Sawmill Cove and Slate Cove will modify fish habitat. Sawmill Cove contains herring spawning habitat. The impacts to fish habitat is discussed in the *Anadromous and Resident Fish Streams Technical Report* and the *EFH Assessment*.

Alternative 2B – East Lynn Canal Highway to Katzeihin with Shuttles to Haines and Skagway – The proposed highway under Alternative 2B follows the same route as under Alternative 2, but terminates at the Katzeihin Ferry Terminal, where a shuttle would travel between Haines and Skagway. Estimated total fill area is approximately 118.6 acres, including 92.4 acres of wetlands and 26.2 acres of marine areas. Eliminating the Katzeihin to Skagway portion of the alignment reduces the total fill on intertidal areas by 0.9 acre, but no reduction in wetlands fill occurs.

Impacts to individual wetlands functions and values would be similar to Alternative 2.

Alternative 2C – East Lynn Canal Highway with Haines/Skogway Shuttle – The proposed highway under Alternative 2C follows the same route as under Alternative 2, but without the Katzeihin Ferry Terminal and shuttle to Haines. Fill of wetlands and marine areas would essentially be the same as Alternative 2, except for a slight reduction in marine fill at the Katzeihin Ferry Terminal site. Total area of fill would be 111.8 acres.

Impacts to individual wetland functions and values would also be similar to Alternative 2.

Alternative 3 – West Lynn Canal Highway – Alternative 3 requires the construction of an access road to the Sawmill Cove Ferry Terminal on the east side of Lynn Canal and the construction of a ferry terminal at William Henry Bay, on the west side of Lynn Canal. Total area of wetland and marine fill for construction of this alternative would be 47.3 acres, consisting of 34.0 acres of palustrine wetlands, 1.5 acres of salt marsh, and approximately 11.6 acres of unvegetated marine habitats. This alternative would have fewer impacts on wetlands than any of the East Lynn Canal alternatives, and would have approximately half of the marine fill. Affected wetlands are primarily forested wetlands and marine fill would primarily be located along beach bars and rocky shores.

The highway alignment through the Davidson Glacier outwash plain would impact less than 2.0 acres of wetlands due to the October 2003 realignment of the route in this area.

Impacts to wetland functions and values for individual wetlands are associated with modifications or reductions in key functions of forested wetlands including groundwater recharge, groundwater discharge/lateral flow, and surface hydrologic control.

High to moderate-high value wildlife habitat would be modified in three wetlands north of the Endicott River and south of the Davidson Glacier Outwash Plain. In addition, the Alternative 3 alignment could impact wildlife movement from salt marsh areas to adjacent upland areas. Wildlife habitat and wildlife corridor impacts are discussed in the *Wildlife Technical Report*.

Impacts from marine fill for the construction of the highway and/or ferry terminals would modify the fish habitat functions. Most of the marine waters on the west side of Lynn Canal are expected to support several life stages of anadromous and marine forage fish species. Specific discussion on the impacts to fish habitat are presented in the *EFH Assessment*.

Alternatives 4A and 4C – Marine Alternative – Auke Bay – Alternative 4A includes one or more fast vehicle ferries (FVFs) to provide daily summer service from Auke Bay to Haines and to Skagway. Alternative 4C includes one or more conventional monohull ferries to provide daily summer service from Auke Bay to Haines and to Skagway. Neither of these alternatives involves the construction of a new highway or ferry terminal; therefore, neither would impact wetlands. However, some fill of marine or subtidal waters would be required at the Auke Bay Ferry Terminal to accommodate Lynn Canal ferries. Estimated required fill at the Auke Bay Ferry Terminal is approximately 0.7 acres.

Alternatives 4B and 4D – Marine Alternative – Berners Bay – Under these alternatives, Glacier Highway would be extended from Echo Cove to Sawmill Cove in Berners Bay. A ferry terminal would be constructed at Sawmill Cove. Alternative 4B has one or more FVFs to provide daily service from Sawmill Cove to Haines and to Skagway in the summer and from Auke Bay to Haines and to Skagway in the winter. Alternative 4D has one or more conventional monohull ferries to provide daily service from Sawmill Cove to Haines and to Skagway in the summer and from Auke Bay to Haines and to Skagway in the winter. For both of these alternatives, impacts would include filling 0.7 acres of a palustrine scrub-shrub/forested wetland, 0.01 acres of palustrine emergent wetlands, 10.3 acres of forested wetlands, 1.9 acres of rocky shore at the terminal site, and 0.7 acres of marine area at the Auke Bay Ferry Terminal.

1.0 PROJECT DESCRIPTION AND ALTERNATIVES

1.1 Purpose and Need

The purpose of the Juneau Access Improvements Project is to improve surface access to and from the city of Juneau within the Lynn Canal corridor that will:

- Provide the capacity to meet the transportation demand in the corridor.
- Provide flexibility and improve opportunity for travel.
- Reduce travel time between Lynn Canal communities.
- Reduce state costs for transportation in the corridor.
- Reduce user costs for transportation in the corridor.

1.2 Project Description

Lynn Canal, located approximately 25 miles north of Juneau, is the waterway that connects Juneau with the cities of Haines and Skagway via the Alaska Marine Highway System (AMHS). At present there is no roadway connecting these three cities. The Glacier Highway originates in Juneau and ends at Echo Cove, approximately 40.5 miles to the northwest.

As required by the National Environmental Policy Act (NEPA), the Supplemental Draft Environmental Impact Statement (SDEIS) for the Juneau Access Improvements Project considers the following reasonable alternatives:

Alternative 1 – No Action Alternative – The No Action Alternative includes a continuation of mainline AMHS service in Lynn Canal as well as the operation of the fast vehicle ferry (FVF) *M/V Fairweather* between Auke Bay and Haines and Auke Bay and Skagway. The *M/V Aurora* would provide shuttle service between Haines and Skagway, beginning as early as 2005.

Alternative 2 (Preferred) – East Lynn Canal Highway with Katzeihin Ferry Terminal – This alternative would construct a 68.5-mile-long highway from the end of Glacier Highway at the Echo Cove boat launch area around Berners Bay to Skagway. A ferry terminal would be constructed north of the Katzeihin River delta, and operation of the *M/V Aurora* would change to shuttle service between Katzeihin and the Lutak Ferry Terminal in Haines. Mainline ferry service would end at Auke Bay, and the existing Haines/Skogway shuttle service would be discontinued. The *M/V Fairweather* would be redeployed on other AMHS routes.

Alternative 2A – East Lynn Canal Highway with Berners Bay Shuttles – This alternative would construct a 5.2-mile highway from the end of Glacier Highway at Echo Cove to Sawmill Cove in Berners Bay. Ferry terminals would be constructed at both Sawmill Cove and Slate Cove, and shuttle ferries would operate between the two terminals. A 52.9-mile highway would be constructed between Slate Cove and Skagway. A ferry terminal would be constructed north of the Katzeihin River delta, and the *M/V Aurora* would operate between the Katzeihin and the Lutak Ferry Terminals. Mainline ferry service would end at Auke Bay, and the existing Haines/Skogway shuttle service would be discontinued. The *M/V Fairweather* would be redeployed on other AMHS routes.

Alternative 2B – East Lynn Canal Highway to Katzeihin with Shuttles to Haines and Skogway – This alternative would construct a 50.5-mile highway from the end of Glacier Highway at Echo Cove around Berners Bay to Katzeihin, construct a ferry terminal at the end of

the new highway, and run shuttle ferries to both Skagway and Haines from the Katzehin Ferry Terminal. The Haines to Skagway shuttle service would continue to operate, two new shuttle ferries would be constructed, and the *M/V Aurora* would be part of the three-vessel system. Mainline AMHS service would end at Auke Bay. The *M/V Fairweather* would be redeployed on other AMHS routes.

Alternative 2C – East Lynn Canal Highway with Haines/Skogway Shuttle – This alternative would construct a 68.5-mile highway from the end of Glacier Highway at Echo Cove around Berners Bay to Skagway with the same design features as Alternative 2. The *M/V Aurora* would continue to provide service to Haines. No ferry terminal would be constructed at Katzehin. Mainline ferry service would end at Auke Bay, and the *M/V Fairweather* would be redeployed on other AMHS routes.

Alternative 3 – West Lynn Canal Highway – This alternative would extend the Glacier Highway 5.2 miles from Echo Cove to Sawmill Cove in Berners Bay. Ferry terminals would be constructed at Sawmill Cove and William Henry Bay on the west shore of Lynn Canal, and shuttle ferries would operate between the two terminals. A 38.9-mile highway would be constructed between William Henry Bay and Haines with a bridge across the Chilkat River/Inlet connecting to Mud Bay Road. The *M/V Aurora* would continue to operate as a shuttle between Haines and Skagway. Mainline ferry service would end at Auke Bay, and the *M/V Fairweather* would be redeployed on other AMHS routes.

Alternatives 4A through 4D – Marine Options – The four marine alternatives would construct new shuttle ferries to operate in addition to continued mainline service in Lynn Canal. All of the alternatives would include a minimum of two mainline vessel round trips per week, year-round, and continuation of the Haines/Skogway shuttle service provided by the *M/V Aurora*. The *M/V Fairweather* would no longer operate in Lynn Canal. All of these alternatives would require construction of a new double stern berth at Auke Bay.

Alternative 4A – FVF Shuttle Service from Auke Bay – This alternative would construct two FVFs to provide daily summer service from Auke Bay to Haines/Skogway.

Alternative 4B – FVF Shuttle Service from Berners Bay – This alternative would extend the Glacier Highway 5.2 miles from Echo Cove to Sawmill Cove in Berners Bay, where a new ferry terminal would be constructed. Two FVFs would be constructed to provide daily service from Sawmill Cove to Haines/Skogway in the summer and from Auke Bay to Haines/Skogway in the winter.

Alternative 4C – Conventional Monohull Shuttle Service from Auke Bay – This alternative would construct two conventional monohull vessels to provide daily summer service from Auke Bay to Haines/Skogway. In winter, shuttle service to Haines and Skagway would be provided on alternate days.

Alternative 4D – Conventional Monohull Shuttle Service from Berners Bay – This alternative would extend the Glacier Highway 5.2 miles from Echo Cove to Sawmill Cove in Berners Bay, where a ferry terminal would be constructed. Two conventional monohull vessels would be constructed to provide daily service from Sawmill Cove to Haines/Skogway in the summer and alternating day service from Auke Bay to Haines/Skogway in the winter.

1.3 Federal Regulations and Permitting

All “build” alternatives of the Juneau Access Improvements Project require the placement of fill in waters of the United States (U.S.), including wetlands, within the transportation corridor. Placement of fill in waters of the U.S. is regulated by the Clean Water Act (CWA) (33 United States Code [U.S.C.] 1344). Placement of fill below mean high water is regulated by Section 10 of the Rivers and Harbors Act (33 U.S.C. 403). Section 404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers (USACE) to grant permits for the discharge of dredged or fill material into waters of the U.S.

1.3.1 Waters of the United States

In the Code of Federal Regulations (CFR) [33 CFR§328.3(a)], jurisdictional waters of the U.S. are defined as:

- (1) all waters that are currently used, or were included in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
- (2) all interstate waters including interstate wetlands;
- (3) all other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
 - (i) which are or could be used by interstate or foreign travelers for recreational or other purposes; or
 - (ii) from which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
 - (iii) which are used or could be used for industrial purpose by industries in interstate commerce;
- (4) all impoundments of waters otherwise defined as waters of the United States under the definition;
- (5) tributaries of waters identified in paragraphs (a)(1)-(4) of this section;
- (6) the territorial seas; and
- (7) wetlands adjacent to waters (other than waters that are themselves wetlands) as described above.

Wetlands are defined as a subset of U.S. jurisdictional waters in Part 3 of the above definition. The USACE provides an additional description of wetlands:

“those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.”

1.3.2 Section 404 and Section 10 Permits

There are two types of Section 404 permits for placing fill in waters of the U.S.: individual permits and general permits. Individual permits are generally used for larger projects that would result in substantive impacts (i.e., greater than 1/3 acre) to wetland area and/or function (Federal Transit Administration [FTA], 2003). Due to the size of the project area and its potential to impact wetlands, the Juneau Access Improvements Project would require an individual Section 404 permit.

The Rivers and Harbors Act places navigable rivers, channels, and other waters into the jurisdiction of the USACE. This Act requires a Section 10 permit for the creation of any obstruction to these waters (33 U.S.C. 403). This permit would be applied for in conjunction with the USACE Section 404 permit.

1.4 State and Local Regulations and Permitting

It is likely the Juneau Access Improvements Project will be subject to State of Alaska and local government resource-related authorizations, as appropriate for the alternative selected. When state or federal permits are required, the project would also be subject to requirements of the Alaska Coastal Management Program (ACMP), which includes enforceable policies of local districts' coastal management plans that are incorporated into the ACMP.

Potential resource-related authorizations required from the State for the improvements project are listed below (the authorization specifically required for wetlands fill is the Alaska Department of Environmental Conservation (ADEC) 401 certification, as well as any landowner authorization):

- ADEC Certification of Reasonable Assurance (water quality certification) under Section 401 of the Clean Water Act. This authorization would be required if the project is within the USACE Section 404 jurisdiction (discussed in Section 1.3).
- Alaska Department of Natural Resources (ADNR).
 - Division of Mining, Land and Water (DMLW) land use permit for development affecting State-owned land below mean high water (MHW) or other lands owned by the State. In the case of the Juneau Access Improvements Project, A DNR would transfer management authority to the Department of Transportation and Public Facilities (DOT&PF) by authorizing an Interagency Land Management Agreement (ILMA).
 - Office of Habitat Management and Permitting (OHMP) for work within fish-bearing streams. Specifically, Anadromous Fish Act, Alaska Statute 41.14.840 (Fishway Requirements Section) requires authorization for activities within or across a stream if the activity could represent an impediment to the efficient passage of fish, and Section 870 (Anadromous Fish Section) requires authorization for all activities within or across, or instream activities affecting, a specified anadromous waterbody. Specified waterbodies are those contained in the "Catalog of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes."
- Certain activities may require authorization by local governments.

ACMP requirements:

- The Office of Project Management and Permitting (OPMP) implements the ACMP to assess projects proposed in the State's coastal zone through a network of State and local authorities. The ACMP contains standards in 6 Alaska Administrative Code (AAC) 80, which pertain to, in part, geophysical hazards areas, recreation, transportation and utilities, subsistence, habitats, water quality, historic and archaeological resources, and other topics, as well as incorporated enforceable policies of coastal districts with approved coastal management plans. If a project requires State or Federal resource authorizations and will affect the uses and resources of the coastal zone, an ACMP review is necessary to analyze the project for consistency with the standards in 6 AAC 80 and coastal district enforceable policies. If a Federal permit is required, or permits from more than one State agency, OPMP coordinates the State review and, based on comments by State review participants (State resource agencies and affected coastal districts) and the public, issues a consistency determination. Concurrently with the ACMP review, State agencies with permitting responsibilities would also evaluate the project according to their specific permitting authorities. The project must be found consistent with the ACMP before State or Federal resource authorizations may be issued. Issuance of authorization by ADEC would constitute consistency with the ACMP Air, Land, and Water Quality Standard.
- The project is within three coastal districts that have approved coastal management plans and enforceable policies: City and Borough of Juneau, Haines Borough, and the City of Skagway.

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2.0 METHODS

This Wetlands Technical Report addresses the functions and values of, and the impacts to, USACE jurisdictional wetlands and marine waters of the U.S. Impacts to identified riverine waters of the U.S. are addressed in the *Anadromous and Resident Fish Streams Technical Report*. Detailed delineation of all jurisdictional streams will be prepared during the design phase and reported in the preliminary jurisdictional determination. Further information about intertidal/subtidal impact areas can be found in the *Essential Fish Habitat (EFH) Assessment*.

2.1 Wetlands Studies and 1997 DEIS

The 1997 Juneau Access Improvements Draft Environmental Impact Statement (DEIS), Wetlands Technical Report assessed the impacts of the proposed alternatives on wetlands using several methodologies. Federal and State resource agencies with jurisdiction over wetlands and special aquatic sites were consulted on the appropriate level of documentation necessary to assess wetlands impacts. At that time, the agencies agreed that the identification and quantification of wetland types potentially impacted by different highway alignments should be based on U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) maps. Existing NWI maps were considered adequate for most of the project area, but there were several locations where the delineations needed clarification. It was decided that field wetland delineations should be made in the following locations to verify the existing NWI maps:

- Slate Creek – two determinations, one east of the creek and one west of the creek.
- Antler River mouth – two determinations east of the river.
- Lace/Berners River delta – one determination on an island.
- Katzeihin River mouth – one determination at proposed bridge crossing of a special aquatic site (vegetated shallows) and two determinations north of the river.

Wetland field determinations for these four areas were performed during the summer of 1994 in accordance with methods presented in the 1987 Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory, 1987). All other wetland areas were identified using NWI maps. The total area of each wetland class impacted by the proposed highway alignments was calculated from NWI polygons.

Wetland functional analysis followed the rating system and valuation criteria described in *Juneau Wetlands: Function and Value Study* (Adamus, 1987). The value of each wetland system was rated from high to low for each of the following functions:

- Groundwater recharge, discharge, and lateral flow
- Surface hydrologic control
- Sediment/toxicants retention, nutrient export
- Riparian support
- Salmonid habitat
- Disturbance – sensitive wildlife
- Regional ecological diversity
- Erosion sensitivity

- Ecological replacement cost
- Recreational use
- Downslope beneficiary sites

No field verification of the functional comparative analysis was conducted. The value assessment assigned weighted numerical values to the function ratings and averaged the total to obtain a single rating for each wetland complex.

The DEIS compared the alternatives based on the total acreage of habitats with high to moderate value ratings that would be affected. The DEIS concluded that the East Lynn Canal EIS-B alignment would have a high impact on wetlands, with fill and/or excavation affecting 52.4 acres of high to moderate valued wetlands. The EIS-A alignment across the Berners Bay tide flats would impact the same amount of high to moderate valued wetlands plus an additional 85 acres of marine unvegetated tidal flats. The West Lynn Canal alternative was rated as having a low impact on wetlands, with fill and/or excavation affecting 5.7 acres of moderate valued wetlands. High valued wetlands were avoided on this alignment. The AMHS improvement alternatives were all rated as having low impacts on wetlands, with limited marine fill required at the Sawmill Cove Ferry Terminal.

The DEIS rated the overall significance of wetland impacts based on the amounts of wetlands lost under each alternative compared to the quantity and quality of those wetlands in the project area. Although the East Lynn Canal highway had the greatest impact of all alternatives, the DEIS concluded that it would impact 0.5 percent of total wetlands in the area and that long-term impacts on overall productivity and other wetland functions would be insignificant.

2.2 Supplemental DEIS

When the Environmental Impact Statement (EIS) process was reinitiated in 2003, the 1997 DEIS highway alternative alignments were modified; therefore, the potential impacts on area wetlands changed. Furthermore, agency comments on the 1997 DEIS, as well as 2003 scoping comments, indicated that further analysis was needed. DOT&PF needed to reassess the impacts of the proposed project on jurisdictional areas given the new alignments and agency concerns. This document is intended to update and build on the information presented in the DEIS and is considered to be supplemental. However, the following analysis is based on a substantial amount of new fieldwork and wetland delineations that were conducted in 2003. The methodology for collecting and analyzing the new data, and for assessing the impacts of the 2003 proposed highway alignments on wetlands is described in the following sections.

This technical report focuses on the potential direct effects of the alternatives on waters of the U.S. and impacts to the functions and values of these areas. Indirect and cumulative effects to waters of the U.S. and their functions are further discussed in the *Indirect and Cumulative Effects Analysis Report*.

2.3 Wetlands Fieldwork in 2003

2.3.1 Coordination with Agency Personnel

An agency scoping meeting was held with representatives from the DOT&PF, the Federal Highway Administration (FHWA), the U.S. Environmental Protection Agency (USEPA), the U.S. Department of Agriculture (USDA) Forest Service, the USFWS, the USACE, the Alaska Department of Fish and Game (ADF&G), the ADNR and the U.S. Coast Guard (USCG) on April

14, 2003. The need to conduct additional wetland field surveys was identified as a result of this meeting.

An agency meeting was held on May 29, 2003, to clarify issues, agree on assessment methodology, and define required fieldwork associated with the Juneau Access Improvements Project wetland technical study. A draft methodology for wetlands assessment and a binder with the 1997 wetlands maps and field data sheets were provided as handouts for discussion. The draft document provided a summary of the 1997 wetlands methodology and a proposed methodology for the 2003 fieldwork. The following methods and scope of work were agreed upon for the 2003 wetlands assessment efforts.

Methodology – Wetlands will be assessed as individual wetlands rather than complexes. Infield wetland assessments should collect the following information: GPS coordinates; digital photographs of vegetation, soil profiles, and site hydrology; verification of NWI classification; completion of a field data sheet (USACE 1987 methodology); and completion of a wetland functional assessment data form (modified Adamus, 1987).

Fieldwork Locations – Field surveys will be conducted at individual wetlands that the proposed alignments or ferry terminals would impact in the following areas:

- Berners Bay
- Katzehin River
- William Henry Bay
- Endicott River
- Sullivan River
- Davidson Glacier area
- Pyramid Island

2.3.2 Preliminary Data Collection

Existing data were reviewed for background information on the project areas prior to the 2003 field investigation to assist in the delineation and evaluation of wetlands. Data reviewed included the following:

- U.S. Geological Service (USGS) topographic maps and NWI maps (scale 1:63,360), Juneau B-2, B-3, B-4, B-5, C-3, C-4, C-5, D-3, D-4, and D-5, and Skagway A-1, A-2, B-1, and B-2
- NWI Notes to Users for Juneau and Skagway Quadrangles, scale 1:63,360
- Existing geographic information system (GIS) layers including streams (USDA Forest Service), water bodies (USGS), and slope and elevation data (DOT&PF)
- National List of Vascular Plant Species that Occur in Wetlands, Region A (Reed, 1988) and 1996 USFWS (USFWS, 1997)
- Low-elevation true color aerial photographs for East Lynn Canal from August 1997 (1:18,000 and 1:36,000 at Berners Bay) and low-elevation true color aerial photographs for West Lynn Canal from July 2003 (1:18,000) (AeroMap U.S.)

- Exploratory Soil Survey of Alaska (Reiger et al., 1979), Soils of the Juneau Area, Alaska (Schoephorster and Furbush, 1974) and Soil Survey of Haines Area, Alaska (McCloskey, 1998)
- Natural Resources Conservation Service (NRCS) Hydric Soils of Alaska (NRCS, 1995)
- Draft 2002 ADF&G Anadromous Streams GIS coverage for the Catalog of Waters Important for Spawning, Rearing or Migration of Anadromous Fishes

The NWI maps and aerial photography were used to prioritize field survey site locations where additional investigations were needed. Areas that appeared to have extensive wetland coverage, high value wetlands, or where coverage was questionable, were given the highest priority. In these priority areas, NWI wetlands within 300 feet of the alignment were ground-truthed and evaluated for functions and values. All proposed ferry terminal sites were evaluated for wetland and/or marine impact. Sites between proposed alignment Stations 970+00 and 1240+00 (Station numbering as of July 2003 alignment) were evaluated using only NWI mapping and aerial photography interpretation due to the extensive area of similar wetland types and because little opportunity exists for adjusting the alignment to avoid these wetlands.

2.3.3 Field Data Collection

Wetland delineations were based on the USACE definition of hydric soils, hydrophytic vegetation and periodic inundation or saturation (wetland hydrology). These terms are defined as the following for the purposes of this report (Environmental Laboratory, 1987):

- **Hydrophytic vegetation** – Vegetation community that is dominated by plant species that are adapted to saturated and/or inundated soils.
- **Hydric soil** – Soils that are saturated and/or inundated for a period long enough to create anaerobic conditions and sustain hydrophytic vegetation.
- **Wetland hydrology** – Includes the hydrologic characteristics (e.g., saturation, inundation) of areas where water has an overriding influence on vegetation and soils during the growing season.
- **Uplands** – Non-wetland areas not including deepwater aquatic habitats or other special aquatic sites, which lack one or more of the criteria required to be classified as a wetland.

Field surveys were conducted from July 22 to July 31, 2003. Persons conducting the field surveys included URS Corporation (URS) senior biologist David Erikson, URS field biologist Kristin Marsh, USKH geographic positioning system (GPS) technician Seth Mearig, and wildlife observer Marcus Trivette with R&M Consulting. Access to the field survey sites was by helicopter (Hughes 500, Temsco Helicopters, Juneau), except for the first day when Sawmill Cove was accessed by boat.

Field methods for verifying wetland classification and boundaries were based on the presence of three parameters: hydrophytic vegetation, hydric soils, and wetlands hydrology, as outlined in the USACE Wetlands Delineation Manual (Environmental Laboratory, 1987). Specific methods generally follow *Section D, Routine Determinations, Subsection 2 – Onsite Inspection Necessary*. Field notes were recorded on the wetland field data sheet, a modified version of the USACE Preliminary Jurisdictional Determination data sheet provided in the USACE Wetlands Delineation Manual (Environmental Laboratory, 1987; see Attachment A). Wetlands identification numbers were assigned according to their location along the proposed alignments as of July 2003. For example, a wetland located near Station 1400+00 would receive a wetland

ID number 1400-1. For geographic positioning in the field, a backpack Trimble ProXRS/TSC1 GPS unit was used. Coordinates were projected in Eldred Grid, a project-specific projection common to the Juneau region. GPS coordinates were recorded at each field site where satellite coverage allowed. Wetland boundaries were recorded where feasible.

2.3.4 Vegetation

At each representative observation point, vegetation was identified to species based on Hulten (1968) for vascular plants and Viereck and Little (1972) for woody species. The Alaska Vegetation Classification System (Viereck *et al.*, 1992) was used for names of upland vegetation communities. Scientific names of several species have changed in recent years; these names have been updated where applicable. Percent aerial cover was estimated for each plant species present in the plot in order to determine the prevalent vegetation community. The sample plots had an estimated size of 30-foot radius for trees, 9-foot radius for shrubs, and 3-foot radius for grasses and forbs. Those species that collectively exceeded 50 percent of the total percent aerial coverage were considered to be dominant, as were those species that individually had an aerial coverage of 20 percent or more (50/20 Rule, Environmental Laboratory, 1987).

A plant indicator status, as designated by the USFWS (Reed, 1988; USFWS, 1997), was assigned to each plant species. To be considered a hydrophytic plant species, the plant species indicator must be an obligate wetlands (OBL) species (found in wetlands more than 99 percent of the time), facultative wetland species (FACW) (67-99 percent), or facultative species (FAC) (33-67 percent) (Reed 1988, USFWS 1997). Facultative upland (FACU) and upland (UPL) indicators are reserved for plant species only found in wetlands from 1-33 percent or less than one percent of the time, respectively (Reed 1988, USFWS 1997).

The list of dominant plant species was combined across strata (i.e., trees, shrubs and grasses/forbs) and ranked from highest to lowest percent aerial coverage. The percent of hydrophytic vegetation was calculated by dividing the total number of species with an indicator status of FAC, FACW, or OBL by the total number of dominant species. In order to satisfy the USACE wetland vegetation criteria, at least 50 percent of the vegetation must be hydrophytic.

USACE Preliminary Jurisdictional Determination sheets were used to record data at observations points. Photographs were taken to document the vegetation and soil at each site.

Riverine areas, below the “ordinary high water,” were designated according to the Cowardin classification on the NWI maps (Cowardin *et al.*, 1979). Function and value assessments were not conducted for these sites. This report does not address effects of the project on riverine areas. Discussions of riverine areas and potential project impacts are presented in the *Anadromous and Resident Fish Streams Technical Report* and the *EFH Assessment*.

2.3.5 Soil Classification

General soils information for the project area is taken from the *Exploratory Soil Survey of Alaska* (Reiger *et al.*, 1979). Detailed soil mapping is not available for this area, but descriptions of soils from the Juneau area (Schoephorster and Furbush, 1974) and the Haines area (McCloskey, 1998) apply. Hydric soils are saturated at or near the soil surface with water that is virtually lacking free oxygen for significant periods during the growing season, or soils that are flooded frequently for long periods during the growing season (National Technical Committee for Hydric Soils [NTCHS], 1994). Hydric soils in the project area are separated into two major categories: organic soils (histosols) and mineral soils.

Histisols in this region can be from 1 to 30 feet deep and include typic cryohemists (sedge peats), terric cryosaprists (organic soils in forested wetlands), typic sphagnofibrists (sphagnum peats), lithic cryohemists and lithic cryosaprists (organic soils on bedrock), and fluvaquentic cryofibrists (marsh soils in floodplains) (Schoephorster and Furbush, 1974; McCloskey, 1998). Common soil series include:

- Fu Series – very poorly drained, moderately deep sphagnum peat soils near the coast underlain by silty tidal deposits
- Kaikli Series – poorly drained muck soils over shallow bedrock in areas of seepage
- Karheen Series – poorly drained gravelly muck soil on uplifted coastal beaches
- Kina Series – very poorly drained deep sedge peat soils on benches and footslopes
- Kogish Series – very poorly drained deep sphagnum peat soils
- Maybeso Series – very poorly drained muck peat soils in seepage areas over glacial till

In other wetland areas, organic matter does not accumulate and soils have developed as mineral soils. Saturation in these areas may result from groundwater seepage, topographic position, or low permeability of the lower soil horizons. These hydric mineral soils have been classified and described for Juneau and Haines areas (Schoephorster and Furbush, 1974; McCloskey 1998). These soils include:

- Am Series – somewhat poorly drained and poorly drained soils on broad floodplains, occasionally flooded for short periods by runoff during snow melt and heavy rains
- Le Series – poorly drained soils in depressions on floodplains with occasional flooding
- Wadleigh Series – somewhat poorly drained soils over firm glacial till
- Co Series – poorly drained soils on low-lying alluvial plains near the coast

Soils found in tidal marshes and meadows at the mouths of valleys (typic cryaquents) are loamy, poorly drained soils and considered hydric (Reiger *et al.*, 1979; NRCS, 1995).

During the field survey, soils were sampled at appropriate observation points and evaluated for indicators of hydric soil conditions. Soil pits were dug to a minimum depth of 16 inches. Soil color was identified according to Munsell Soil Color Charts (1994). Soil pits were not dug in areas with standing water. Soil series for the wetland sites have been identified when possible and are indicated on the wetland field data sheets (see Attachment C).

2.3.6 Hydrology

Information on general site hydrology was interpreted from aerial photographs. On-site observations of wetland hydrology included the following criteria: inundated or saturated soils, landscape position, oxidized or reduced root channels, or sediment and debris deposits from previous flooding. Rainfall prior to any field investigation can influence the observation of site hydrology. Table 2-1 presents precipitation data recorded from sites around the project area.

2.3.7 Wetland Functions and Values Methodology

Wetland functions are “the physical, chemical, and biological processes or attributes that contribute to the self-maintenance of wetland ecosystems” (American Society of Testing and Material [ASTM] International, 1999). The value of a wetland lies in the social and economic

benefits that it provides to people, in addition to the environment. Wetland function rating for maintaining the wetlands for habitat for fish and wildlife also implies the socioeconomic value of providing fish and wildlife for recreation and consumptive use.

A modified version of the Adamus Resource Assessment, Inc. (Adamus) Wetland Evaluation Technique (WET) (Adamus, 1987; SWCA Environmental Consultants, 2002) was used to evaluate the wetlands in the project area. The Interagency Working Group of the Juneau Airport EIS revised this primarily freshwater assessment methodology in order to consider coastal wetlands (SWCA Environmental Consultants 2002). However, with regards to marine waters and tidal flats, several of the criteria have only very limited application, such as groundwater and surface hydrologic control, since the methodology was developed primarily for freshwater wetlands. Observations on all of the criteria were evaluated during the field visit as appropriate.

Qualitative field notes of functions and values were recorded on a modified version of the Juneau Airport EIS Wetland Functional Assessment Data Form (see Attachment A). Notes were taken on the location of the wetland, proximity to geographic features (e.g., streams, slopes), vegetation type, size of wetland, and other pertinent information when defining wetland functions. The rating of wetland functions and values is necessarily qualitative based on general criteria selected for evaluation and the judgment of the observers in the field. Wetland function and value summary sheets were prepared from the field data forms and are presented in Attachment D. The function and values ratings from the summary sheets are tabulated in Tables B-1 and B-2. The functions and values used in the assessment discussed below, along with a generalized description of the wetland function ratings, as defined by Adamus (1987) and Adamus and Stockwell (1983) (see Attachment A).

Wetland Functions and Values

Groundwater Recharge is the (typically downward) movement of surface water or precipitation into the groundwater flow system (Adamus and Stockwell, 1983). This is important to the sustainability of aquifers used for drinking water and supports the hydrological linkage of wetlands. Generally, the groundwater recharge function is rated as high to moderate when it is a muskeg wetland or when the wetland is located at or near a topographic divide for surface water systems. The groundwater recharge is rated as low when it is an isolated wetland or the wetland is enclosed by development (Adamus, 1987).

Groundwater Discharge and Lateral Flow is the (typically upward or lateral) movement of water from the groundwater flow system into the surface water flow system (Adamus and Stockwell, 1983). Groundwater discharge is important to fisheries and the maintenance of streams. Lateral flow of groundwater provides water movement below the plant root zone. Generally, groundwater discharge and lateral flow functions of wetlands are rated as high to moderate in wetlands located within 200 feet of streams or within estuarine areas, and are rated as low when the wetlands are isolated or enclosed by development (Adamus, 1987).

Surface Hydrologic Control (also known as Flood Storage and Desynchronization or Stream Flow Moderation) is the process by which a wetland slows the flow of water as it travels downslope/downstream, reducing the magnitude of peak flows and serving as a storage area during flood waters. This function is important in reducing bank erosion and providing a steady outflow to streams during dry seasons (Adamus and Stockwell, 1983; Adamus, 1987). Surface hydrologic control is often rated as high in wetlands with slopes less than 3 percent, where groundwater discharge is rated as low, or where hydrological models indicate the wetland is important to monthly desynchronization. Generally, the rating decreases (from high to low) for this function as the slope angles increase and/or the groundwater discharge function rating

increases (from low to high). Tidal wetlands and wetlands with slopes greater than 7 percent generally receive a low surface hydrologic control rating (Adamus, 1987).

Sediment and/or Toxicant Retention is the removal of suspended inorganic particulates and/or the removal of toxic metals and hydrocarbons from solution. This improves the water quality downstream, but may result in adverse impacts onsite. In general, wetlands with low slope angles (i.e., less than 3 percent) and/or a measured reduction in turbidity as the water flows through the wetland are rated as high for this function. Wetlands that are mostly unvegetated or have high slope angles are rated as low for sediment and/or toxicant retention (Adamus, 1987).

Nutrient Transformation and Export is the transformation and exportation of nutrients (especially nitrogen and phosphorous) within the wetland vegetation or substrate. This controls eutrophication downstream, supports food chains through nutrient cycling, and may have a positive or negative effect on wildlife habitat (i.e., enriched waters may be beneficial to some species, but toxic to others). A wetland with a high nutrient transformation and export rating is generally connected by channel flow to a creek or river, or has high surface hydrologic control (e.g., dense emergent vegetation, deep or open water habitats, algae mats). Moderate and low rated wetlands are either restricted or completely lack surface water outlets (Adamus, 1987).

Riparian Support is the indirect positive influence a wetland may have on adjacent or downstream waters, including regulation of water temperature, shoreline stabilization, and sediment removal. Wetlands that are valued for their riparian support are connected to a permanent stream, lake, or estuary and contain either dense emergent vegetation, which may remove sediments and/or provide shoreline stabilization, or forested vegetation that provides shade to the surface water. Forested vegetation that provides shade regulates water temperature, while also providing shoreline stabilization and/or sediment removal. Since isolated wetlands are not connected to streams or estuaries, they are rated as having low riparian support value (Adamus, 1987).

Fish Habitat (including anadromous, resident, and marine finfish and shellfish) includes physical and chemical factors that affect the survivability of adult and juvenile finfish and shellfish. These factors may include cover, water temperature, food availability, structure, dissolved oxygen, salinity, etc. Some of the most valued Alaskan wetlands serve as habitat for anadromous Pacific salmon. NMFS defines essential fish habitat (EFH) for Pacific salmon species as the area that extends from the high seas of the exclusive economic zone to the headwaters of each spawning stream. Less than half of the anadromous fish streams in southeast Alaska have been documented by ADF&G. Generally, ADF&G has to perform site-specific assessments of salmon habitat in areas where development is proposed (personal communication, M. Ingle, January 2004). DOT&PF conducted an ADF&G approved stream survey in 1994. The survey identified approximately 90 streams of which 25 were confirmed to be anadromous streams (13 on the east side and 12 on the west side of Lynn Canal). The information from the 1994 survey was provided to ADF&G for cataloguing purposes. Additional information on anadromous streams in the project area is presented in the *Anadromous and Resident Fish Streams Technical Report*.

NMFS defines all marine intertidal areas and all waters and substrate necessary to fish species managed by NMFS for spawning, breeding, feeding, or growth as EFH. This includes marine intertidal areas in Lynn Canal regions, such as unconsolidated beaches and rocky shores. Nearshore estuarine emergent wetlands also provide spawning and rearing areas for marine fish species. These areas can support several species and life stages of salmon, along with marine finfish, shellfish or other EFH species. Habitat that is good for rearing, migration, and/or spawning (e.g., overwinter rearing, spring spawn migration, fall spawning) are considered to

have a high fish habitat value. Wetlands that have low fish habitat value are restricted (e.g., they contain obstacles or are connected by intermittent streams) with low or no surface water, although these wetlands may provide some habitat during infrequent flooding events (Adamus, 1987). Additional information on impacts to fish habitat is included in the *Anadromous and Resident Fish Streams Technical Report* and the *EFH Assessment*.

Wildlife Habitat includes wetlands that contain features that support wildlife species. The wildlife habitat methodology used in this assessment is based on the assessment methods used by Adamus for Juneau wetlands (Adamus, 1987) and an assessment conducted for the Juneau International Airport EIS (SWCA Environmental Consultants, 2002). Both of these assessments used “disturbance-sensitive wildlife” species as indicator species for wetland wildlife habitat ratings. The sensitivity of wildlife to disturbance is roughly proportional to body size and the propensity to use open, sparsely vegetated areas. For example, species such as waterfowl are more sensitive to disturbance than small songbirds that can conceal their movements with sparse vegetation (Adamus, 1987). The disturbance sensitive species used in this assessment and common to the assessments noted above are Vancouver Canada goose, bald eagle, mallard, and great blue heron. In addition, brown bear, black bear, and moose were included in the wildlife habitat assessment. Because wetlands were evaluated on an individual basis, evaluations of wildlife habitat for wide-ranging brown bear, black bear, and moose were limited. Additional information on impacts to wildlife habitat for all of the species addressed in this assessment is included in the *Wildlife Technical Report*. Species in intertidal marine areas include harbor seal and Steller sea lion. These species are addressed separately in the *Wildlife Technical Report* and the *Steller Sea Lion Technical Report*.

Wetlands documented as receiving high use by waterfowl and shorebirds or receiving high use by Vancouver Canada goose, bald eagle, mallard, and great blue heron relative to other similar areas are rated as having a high wildlife habitat value. Additionally, wetlands that contain certain vegetation, including Lyngbye’s sedge (*Carex lyngbyei*), seaside plantain (*Plantago maritima*), seaside arrow-grass (*Triglochin maritima*), or ditch grass (*Ruppia maritimus*) are rated as having high wildlife habitat value for its food value for migrating waterfowl and terrestrial species such as brown and black bear. Large wetlands (>2 acres) dominated by emergent vegetation adjacent to forest or scrub-shrub vegetation are also rated as having high wildlife habitat value because they provide food, water, and cover for wildlife species (e.g., waterfowl and terrestrial animals). Wetlands considered to be of low value for wildlife habitat lack special habitat features or are generally isolated and relatively dry wetlands (Adamus, 1987).

Regional Ecological Diversity provides a means for protecting wetlands with high diversity of indigenous species (gamma diversity) while preventing habitat fragmentation and loss of wildlife corridors. Wetlands with high ecological value are those that are documented to contain or be frequented by rare or semi-rare species, and/or tidal wetlands that abut nontidal emergent wetlands (these wetlands tend to have high vegetation diversity and high wildlife value). Wetlands with a certain abundance of various habitat features (e.g., upturned logs or snags) may also be rated as moderate to high, as these features may provide structure for a variety of species. Finally, wetlands that lack special habitat features, including extensive open water or wetlands isolated from major forest tracts, are generally considered to have low ecological diversity.

Erosion Sensitivity rates the soil stabilizing function of a wetland by taking into account its vegetation coverage, soil type, location, and hydrology. Wetlands with high slope angles (greater than 20 percent) are rated as having high erosion sensitivity, while those wetlands with

low slope angles and high mean bank stability are rated as having low erosion sensitivity (Adamus, 1987).

Ecological Replacement Cost is the estimated dollar cost of replacing the vegetation, hydrology, and function of a wetland. Certain wetlands are more difficult and costly to replace than others due to the complexity of the above listed features. In general, forested wetlands with peat soil, emergent nontidal with peat soil, tidal wetlands, and wetlands with high fish habitat value are the most costly to replace, if replacement is feasible. Ponds and scrub-shrub wetlands, and wetlands with non-peat soils, are the least costly to replace (Adamus, 1987).

Downstream/Coastal Beneficiary Sites considers the location of wetlands, which provide (or could provide) cost-saving services to humans downstream or offsite. These wetlands may prevent damage to human structures by delaying or reducing the force of floods, providing groundwater recharge to community wells, and/or reducing sediment/toxic contamination in surface water used directly by humans. Ratings vary with the functional service and how effectively the wetland provides such services (Adamus, 1987).

Recreational value was applied as an evaluations criterion for wetlands in the 1997 DEIS; however, for this field effort, the rating is considered very subjective and difficult to apply to individual wetlands. Recreation is addressed in the *Land Use and Coastal Zone Technical Report*.

2.4 GIS Mapping and Aerial Interpretation

The combination of field notes, aerial photography interpretation, and GPS coordinates were used to develop wetland maps of the project area using GIS technology. Delineations of wetlands not recorded on the ground are primarily based on NWI delineations and aerial photography interpretation. Digitizing of wetland boundaries using photo interpretation was conducted in ArcView using the 1997 and 2003 Lynn Canal true color aerial rectified orthophotos. Quality control/quality assurance was conducted using stereoscopic interpretation of the true color stereo pair overlays. The area of wetland coverage includes the proposed transportation corridor centerlines within the actual cut and fill lines on both sides of the centerline (i.e., the corridor footprint); however, most wetland boundaries extend beyond the footprint. A list of wetlands not identified by the field crew in July 2003, but delineated using aerial photography can be found in Attachment C (Table C-1).

The photos used in this study are relatively high-quality, low-elevation true color photos. The West Lynn Canal photos are from July 2003, which increases the accuracy of wetland boundaries and calculated wetland acreages. However, the East Lynn Canal photos are six years old (August 1997). The NWI maps for the project area were primarily used as the basis for defining project wetland boundaries. In addition to the photo characteristics, the photo interpreter's knowledge of the environmental distribution of the wetland types was also used. Wetland polygons were attributed with the NWI (Cowardin *et al.*, 1979) code and a wetland identification number, which corresponds to their field data sheet and the July 2003 DOT&PF Station numbers. The Cowardin classification codes are presented on the first page of the figures section in this report.

Final maps were prepared according to the following steps:

- Prepared GIS geodatabases in ArcView
- Digitized wetlands in ArcView

- Corrected digitizing errors and assigned attributes
- Cleaned polygons using ArcInfo
- Calculated impacted acreage
- Prepared labeling annotation and imported additional informational layers
- Prepared, exported, and printed final maps (printed to portable document files [.pdf])

Table 2-1
Rainfall Determination Data for Skagway, Juneau, and Haines

Climate Station	Baseline Data Average (-30% to +30% of Average)	Precipitation During Aerial Surveys	Condition
Skagway (Yakutat WB Airport, AK 9941)	June (1961-1990) = 7.30 inches (4.49-8.84 inches)	June 1997 = 4.57 inches	Normal
	July (1961-1990) = 8.18 inches (5.45-9.80 inches)	July 1997 = 10.08 inches	Wet
	August (1961-1990) = 11.61 inches (7.29-14.02 inches)	August 1997 = 14.92 inches	Wet
Juneau (Auke Bay, AK 0464)	June (1963-1990) = 4.21 in. (3.40-4.81 in.)	June 1997 = 4.41 inches	Normal
	July (1963-1990) = 5.29 inches (4.11-6.12 inches)	July 1997 = 9.68 inches	Wet
	August (1963-1990) = 6.38 inches (4.90-7.71 inches)	August 1997 = 4.24 inches	Dry
Haines (Haines Terminal, AK 3500)	May (1961-1987) = 2.07 inches (1.21-2.52 inches)	*May 2003 = 1.76 inches	Normal
	June (1961-1987) = 1.53 inches (0.87-1.86 inches)	*June 2003 = 1.92 inches	Wet
	July (1961-1987) = 1.53 inches (0.87-1.86 inches)	*July 2003 = 1.19 inches	Normal

Sources: Rainfall data – USDA NRCS. 1999. Climate Information – Wetland Retrieval for Alaska.
<http://www.wcc.nrcs.usda.gov/cgibin/getwetco.pl?state=ak>. Accessed November 8, 2003.
 *Rainfall data – National Weather Service, Alaska Region Headquarters, AK
<http://www.arh.noaa.gov/climate.php>. Accessed November 8, 2003.

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3.0 AFFECTED ENVIRONMENT

Palustrine and estuarine wetlands, as well as marine and riverine areas, occur within the proposed highway alignments and ferry terminal sites on the east and west side of Lynn Canal. The following is a description of the wetlands types found in the project area and their distribution along the alignment of project alternatives. Wetlands rated high for specific wetlands functions are also discussed. All station numbers used in this report are associated with the July 2003 highway alignments (East and West Lynn Canal).

The functions and value assessment results by individual wetland or intertidal marine site are presented in Attachment B-1 for East Lynn Canal and Attachment B-2 for West Lynn Canal. Summary sheets detailing the reasoning behind all functions and values ratings can be found in Attachment D. Potential impacts to riverine and intertidal and subtidal marine areas are discussed in two other reports: the *Anadromous and Resident Fish Streams Technical Report* and the *EFH Assessment*, respectively. Additional information on the impacts to wildlife habitat is included in the *Wildlife Technical Report*.

3.1 Wetlands Types in Project Area

Palustrine wetlands are nontidal wetlands with vegetation dominated by trees, shrubs, persistent emergents, or emergent mosses or lichens, or wetlands that lack such vegetation and are less than 20 acres, have less than 0.5 percent salinity and have less than 6.6 feet of water at low water (Cowardin *et al.*, 1979).

3.1.1 Palustrine Emergent Wetlands

- PEM1/5B: Palustrine persistent emergent vegetation/narrow-leaved – saturated soils
- PEM1/5C: Palustrine persistent emergent/narrow-leaved – seasonally flooded
- PEM1S: Palustrine persistent emergent vegetation – temporarily tidal

There are many palustrine emergent wetlands within the project area, mostly associated with groundwater seeps or muskeg and bog communities, some of which are extensive. Emergent wetlands are components of wetlands complexes of emergent wetlands, aquatic bed/open water features or emergent and scrub-shrub wetlands. The Davidson Glacier outwash plain supports numerous complexes containing emergent wetland complexes. Emergent wetlands vegetation is dominated by a variety of species, including several sedges (*Carex limosa*, *C. spectabilis*, *C. aquatilis*, *C. rostratus*), cottongrass (*Eriophorum spp.*), water horsetail (*Equisetum fluvatile*), buckbean (*Menyanthes trifoliata*), common mare's-tail (*Hippuris vulgaris*), marsh cinquefoil (*Comarum palustre*), and in bog environments, sphagnum moss (*Sphagnum spp.*). These communities typically have a low shrub component of cloudberry (*Rubus chamaemorus*), bog blueberry (*Vaccinium uliginosum*), and Labrador tea (*Ledum groenlandica*). The most extensive emergent wetlands occur between Slate Cove and Sherman Point. Smaller emergent wetlands are distributed throughout the project area.

Wetland Functions and Values – Palustrine emergent wetlands are generally rated as high for groundwater recharge since saturated soils may conduct water downward into the groundwater system. However, this rating is dependent upon the location of the wetland in the watershed (Adamus, 1987). The groundwater discharge and lateral flow rating is also dependent upon the location, with wetlands near a surface water outlet generally receiving a high rating. Emergent wetlands adjacent to streams and rivers may reduce erosion, provide storage during floods, and reduce turbidity (Adamus, 1987).

Wildlife habitat value in these wetlands varies, depending upon the type of vegetation, habitat structure, and size of the wetland. Palustrine emergent wetlands that contain Lyngbye's sedge (*Carex lyngbyei*), seaside plantain (*Plantago maritima*), seaside arrow-grass (*Triglochin maritima*), or ditch grass (*Ruppia maritimus*) have a high value as a wildlife food source for waterfowl and terrestrial species such as bear and moose. Large palustrine emergent wetlands (>2 acres) dominated by emergent vegetation adjacent to forest or scrub-shrub vegetation are also rated as having high wildlife habitat value because they provided food, water, and cover for wildlife species (e.g., waterfowl and terrestrial animals).

Regional ecological diversity of PEM1/5B/C wetlands within the project area is generally moderate to low; however, diversity tends to increase in the complexes (PEM1B/PSS4B, PEM1B/POWH, or PEM1B/PAB4H wetlands).

Human use of these wetlands is generally low but would vary by location. The ecological replacement cost of emergent wetlands in the project area varies according to size and location. Downstream/coastal beneficiary use of palustrine emergent wetlands in the project area is low due to isolation from human structures and residences and/or isolation from surface water outlets.

3.1.2 Palustrine Scrub-Shrub Wetlands

- PSS1A/B/C: Palustrine broad-leaved deciduous scrub-shrub wetlands – temporarily flooded/saturated/seasonally flooded
- PSS4B: Palustrine needle-leaved evergreen scrub-shrub wetlands – saturated soils

Scrub-shrub wetlands are dominated by shrubs and/or trees that are less than 20 feet tall. Sub-classes describe the type of scrub-shrub (e.g., needle-leaved, broad-leaf, dead) (Cowardin *et al.*, 1979). In the project area, scrub-shrub wetlands are dominated by either broadleaf deciduous or needle-leaved evergreen communities of Labrador tea, shore pine (*Pinus contorta* var. *contorta*), mountain hemlock (*Tsuga mertensiana*), western hemlock (*Tsuga heterophylla*), Alaska blueberry (*Vaccinium ovalifolium*), and/or rusty menziesia (*Menziesia ferruginea*). Sitka willow (*Salix sitchensis*) and thinleaf alder (*Alnus tenuifolia*) are also common in many scrub-shrub communities. The herbaceous layer is dominated by skunk cabbage (*Lysichiton americanus*), cloudberry, deer cabbage (*Fauria crista-galli*), and spleenwort-leaf goldthread (*Coptis aspleniifolia*).

Wetland Functions and Values – The groundwater recharge, discharge, lateral flow, surface hydrologic control and nutrient transformation and export functions are dependent on the wetlands proximity to surface water outlets and vary considerably on a case-by-case basis. Scrub-shrub wetlands can provide riparian support when in proximity to streams by stabilizing banks and reducing sediments and toxicants in the water (Adamus, 1987).

Palustrine scrub-shrub wetlands can serve as blueberry foraging areas for black bear and foraging habitat for moose. Songbirds also may use scrub-shrub bogs for nesting and rearing young during the summer months and support some resident birds during the winter.

The regional ecological diversity for scrub-shrub areas is moderate to high, based mostly on vegetative diversity. The ecological replacement cost and downstream/coastal beneficiary use of scrub-shrub wetlands are generally considered low. Erosion sensitivity is often low since the slopes in communities are often less than 20 degrees. Downstream/coastal beneficiary use of palustrine scrub-shrub wetlands in the project area is low due to isolation from human structures and residences and/or isolation from surface water outlets.

3.1.3 Palustrine Forested Wetlands

- PFO1A: Palustrine broad-leaved deciduous forested wetlands – temporarily flooded
- PFO4A/B: Palustrine needle-leaved evergreen forested wetlands – temporarily flooded/saturated soils
- PFO5Fb: Palustrine forested, dead wetlands – semi-permanently flooded, with beavers

Forested wetlands are dominated by trees taller than 20 feet (Cowardin *et al.*, 1979). Large areas of forested wetlands exist within the project area, mostly of the needle-leaved evergreen subclass. In the project area, the tree layer consists mainly of mountain hemlock, western hemlock, and the occasional Sitka spruce (*Picea sitchensis*) or shore pine. The shrub layer is dominated by tall blueberry and rusty menziesia. The herbaceous layer is dominated by Canada bunchberry (*Cornus canadensis*), spleenwort-leaf and Alaska goldthread (*Coptis trifolia*), skunk cabbage, and false lily-of-the-valley (*Maianthemum dilatatum*). Some saturated forested wetlands within the project area have buttressed trees and a thick sphagnum moss layer. Broad-leaved forested wetlands are found along river floodplains and are dominated by black cottonwood (*Populus balsamifera*) with typical understory species of willow (*Salix* spp.) and alder (*Alnus* spp.).

Wetland Functions and Values – Forested wetlands in the project area provide several important functions including groundwater recharge, discharge, and lateral flow; surface hydrologic control; and nutrient transformation/export. The degree to which they provide these functions, however, is largely dependent on their proximity to surface water outlets. Therefore, they are evaluated on a case-by-case basis. Forested wetlands can provide riparian support functions when in proximity to streams by stabilizing banks and reducing sediments in the water (Adamus, 1987).

Forested wetlands are typically rated moderate to low for wildlife habitat due to lack of special habitat features. Forested wetlands that high wildlife habitat value are located adjacent to large wetlands (>2 acres) with permanent standing fresh water or brackish water or permanently flooded fresh emergent marsh and provide food, water, and cover for wildlife species (e.g., waterfowl and terrestrial animals such as moose and bear).

The regional ecological diversity of forested wetlands in the project area is moderate to high, based largely on the abundance of various habitat structures (e.g., snags, pools, fallen logs) (Adamus, 1987). These habitat types are especially abundant in old growth forests.

Because these wetlands are very widespread in southeast Alaska, values of these areas for human uses are similar to upland forested areas. The ecological replacement cost of forested wetlands is moderate to high, dependent upon the percent coverage of large trees and soil type (Adamus, 1987). The downstream/coastal beneficiary use of forested wetlands is low, largely due to their isolation from human communities.

3.1.4 Aquatic Beds (Vegetated Shallows)/Open Water

- PAB4H: Palustrine aquatic bed with floating-leaved vascular vegetation – permanently flooded
- POWH: Palustrine open water, unknown bottom – permanently flooded

Palustrine aquatic bed wetlands contain vegetation that grows on or below the surface of the water for most of the growing season (Cowardin *et al.*, 1979). Dominant vegetation in aquatic bed wetlands of the project area consists of floating-leaf pondweed (*Potamogeton natans*), northern burreed (*Sparganium hyperboreum*), and yellow pond lily (*Nuphar polysepalum*). Aquatic beds are permanently flooded areas.

Wetland Functions and Values – Many of the functions of these sites are dependent on location. Pondered wetlands that are connected by permanent or intermittent streams likely have low surface hydrologic control.

Open water wetlands may serve as important fish habitat, depending on the depth and duration of inundation and access to the area (Adamus, 1987). These wetlands often serve as habitat for waterfowl or water-dependent bird species. Open water wetlands adjacent to spruce/hemlock forest, scrub-shrub (trees < 6m), or deciduous forest have a high wildlife habitat value because the combination of the habitat types provide food, water, and cover for wildlife species (e.g., waterfowl and terrestrial animals such as moose and bear).

Because of their relative scarcity in the project area, and because these ponds are often associated with other wetlands types such as emergent and scrub-shrub wetlands, they are generally rated as having moderate-high to high ecological diversity. Ponds and aquatic beds are relatively easy to replace (from an engineering perspective) and thus have low ecological replacement cost. Downstream/coastal beneficiary use for these sites is low due to their isolation from human structures and residences and/or isolation from other wetlands.

3.1.5 Estuarine Emergent Wetlands (Salt Marshes)

- E2EM1N: Estuarine intertidal persistent emergent vegetation – regularly flooded
- E2EM1P: Estuarine intertidal persistent emergent vegetation – irregularly flooded

Estuarine systems consist of tidal habitats and adjacent tidal wetlands, extending to the seaward limit of emergent vegetation and/or upstream to where the ocean-derived salts measure less than 0.5 percent during low flow periods. Estuarine emergent wetlands or salt marshes are within the intertidal zone but vary in species composition according to the level of exposure to salt water. Dominant vegetation in these wetlands depends on the tidal elevations. Vegetation of upper beach areas consists of beach rye (*Leymus arenarius*), silverweed (*Argentina anserina*), beach pea (*Lathyrus japonicus*), and Lyngbye's sedge. The substrate is mostly gravel and sand. Areas more frequently inundated support salt-tolerant sedges (*Carex* spp.) and forbs, alkali grass (*Puccinella* spp.), sea milkwort (*Glaux maritima*), and salt brush (*Atriplex alaskana*).

Wetland Functions and Values – The water regime of these wetlands is defined by the frequency of flooding (e.g., irregularly flooded, regularly flooded) (Cowardin *et al.* 1979).

Groundwater recharge and groundwater discharge/lateral flow functions are high to moderate based on the abundance of porous alluvial sediment in many of these areas. Transformation and exportation of nutrients from salt marshes supports food chains through nutrient cycling in the nearshore estuarine waters.

Estuarine emergent wetlands, especially regularly flooded areas, are rated as having high fish habitat value if the quality of habitat is good for rearing, migration, or spawning.

Estuarine emergent wetlands that contain Lyngbye's sedge, seaside plantain and seaside arrow-grass are also indicative of high wildlife habitat value (Adamus, 1987) because of the food value for migrating waterfowl and terrestrial species such as brown and black bear.

Estuarine wetlands function to provide riparian support in the protection of shorelines from erosion and are rated generally as high for this function.

Regional ecological diversity of estuarine wetland within the project area is generally high due to the limited distribution and the wide diversity of plant species important to wildlife, support seasonal concentrations of migratory birds, and provide important habitat for several species of anadromous fish and EFH species.

Ecological replacement value for estuarine wetland would have a high replacement value since these areas are geographically limited wetlands communities and provide a wide range of important ecological functions, and these functions are very difficult to replace.

3.1.6 Marine Areas

Other marine areas identified in the project area include intertidal beach bar, flats, and rocky shore. The water regime of these areas is determined by tidal fluctuations (Cowardin *et al.*, 1979). Detailed descriptions of impacted marine sites, intertidal and subtidal areas, are presented in the *EFH Assessment*.

3.2 Distribution of Wetlands and Marine Areas within the Project Area

The following section provides a description of the wetland types in the project area and a discussion of the wetlands identified in the following areas during the 2003 field surveys, with emphasis on specific areas with high functions and values ratings. Wetlands occurrence is addressed within seven sub-regions (see Figure 2 and Table 3-1):

- East Lynn Canal Sub-Region 1 – Echo Cove to Slate Creek
 - Includes Sawmill Cove Ferry Terminal and Berners Bay
- East Lynn Canal Sub-Region 2 – Slate Creek to Sherman Point
 - Includes Slate Cove Ferry Terminal
- East Lynn Canal Sub-Region 3 – Sherman Point to Katzeihin River
- East Lynn Canal Sub-Region 4 – Katzeihin River to Skagway
 - Includes Katzeihin Ferry Terminal
- West Lynn Canal Sub-Region 1 – William Henry Bay to Davidson Glacier
 - Includes Endicott River and Sullivan River
- West Lynn Canal Sub-Region 2 – Davidson Glacier Outwash Plain
- West Lynn Canal Sub-Region 3 – Davidson Glacier to Haines
 - Includes Pyramid Cove, Chilkat River, and Mud Bay

Distribution of wetlands and marine areas within the proposed highway corridors for each sub-region of the project area is presented in Figures 3 through 34.

3.2.1 East Lynn Canal Sub-Region 1

Berners Bay – The East Lynn Canal Sub-Region 1 begins at the mouth of Echo Cove and extends along the southern shoreline of Berners Bay, crosses the Antler and Lace/Berners rivers, and continues inland on the north side of Berners Bay to the Slate Cove drainage. From the end of the existing highway at Echo Cove, the alignment travels along a low bench and intersects a series of forested wetlands (115-1 to 265-1; Figures 3 and 4), apparently fed by groundwater seeps from the hillside. Other wetlands encountered in this portion of the alignment include small fens or muskeg communities of emergent wetlands (270-1; Figures 3 and 4), scrub-shrub/emergent wetlands (340-1 and 440-1; Figures 4 and 5), and isolated stands of forested wetlands (415-1; Figures 4 and 5), also likely a result of groundwater seeps.

At the head of Berners Bay, forested deciduous wetlands occur in low-lying areas adjacent to both the Antler and Lace/Berners rivers (680-2, 735-4; Figure 6). The lower elevations between the two rivers support open emergent meadows (735-2; Figures 6 and 7) that are occasionally flooded during high water events. Large, open estuarine emergent wetlands (735-1; Figures 6 and 7) and tide flats extend across much of the lowland at the head of the bay and between the two rivers and support varying degrees of vegetative cover, depending on the elevation and exposure to tidal flooding and river flow levels.

The October 2003 adjustment of the East Lynn Canal highway alignment shifted the alignment crossing the Antler River farther upstream to minimize impacts to estuarine wetlands (Station 630+00 to Station 750+00). On the north side of the Lace/Berners River, the topographic relief increases and wetlands are relatively sparse (Figure 7). Some stands of forested wetlands (800-1, 800-3 and 830-1; Figure 7) occur in poorly drained areas, often associated with small emergent wetlands (800-2, 800-4, 830-2; Figure 7).

One of the areas with higher ratings for wetland function ratings in this sub-region is the estuarine emergent wetland at the head of Berners Bay. This estuarine emergent wetland (735-1; Figures 6 and 7) has some of the highest ratings for wetland functions on the east side of Lynn Canal, and includes the only very high rating for the wildlife habitat functions. Wildlife habitat in Berners Bay is discussed further in the *Wildlife Technical Report*. Other high ratings are given for riparian support based on the wetland's location along the Lace/Berners River, for regional ecological diversity, and for ecological replacement cost because of its important ecological functions and the extreme difficulty to replace these functions. Because of the importance of this area, these salt marsh habitats were avoided through the December 2003 realignment by moving the bridge crossing inland.

Sawmill Cove Ferry Terminal – Also included in this sub-region is the Sawmill Cove Ferry Terminal site, located within a rocky shore area (370-T; Figures 4 and 5) just north of the Sawmill Creek estuary. This steep rocky beach is largely unvegetated; however, similar to most nearshore waters in this region, this area provides important fish habitat functions. Discussion on intertidal and subtidal habitats is provided in the *EFH Assessment*.

3.2.2 East Lynn Canal Sub-Region 2

Slate Cove to Sherman Point – The topography of this sub-region is gently sloping hills with forested uplands in the higher elevations, and a relatively broad band of forested wetlands (PFO4B) at slightly lower elevations (Figures 8, 9, and 10). Forested wetlands dominate much of the land cover within the highway corridor in Sub-Region 2. Large patches of emergent and scrub-shrub muskeg wetlands occupy the areas of low relief or areas of groundwater discharge. Expanses of seasonally flooded emergent wetlands (PEM1C/PSS4C) located west of Slate

Cove (950-1, 955-1; Figure 8) occupy a large area of low relief that appears to receive surface flow from the hillsides to the north. Forested wetlands become less continuous with only two stands near Sherman Point.

Wetland functions for the large continuous band of forested wetlands (955-2; Figures 8 and 9) are rated high for sediment retention; high to moderate for groundwater recharge, groundwater discharge, and lateral flow; and high for ecological replacement cost. Emergent/scrub-shrub wetlands (e.g., 955-1) are generally rated high to moderate for groundwater recharge and high for sediment retention.

Slate Cove Ferry Terminal – The Slate Cove Ferry Terminal and access highway is also within this sub-region. The terminal location is on a steep gravel beach (E2BB1N) with numerous drift logs (900-T; Figure 8). Vegetation is typical of well-drained beach habitat. Similar to other intertidal sites, fish habitat function is rated as high. Wildlife habitat functions of this site are also rated as high based on documented use by waterfowl. Regional ecological diversity is also rated as high.

3.2.3 East Lynn Canal Sub-Region 3

Sherman Point to the Katzeihin River – The topography of this sub-region is dominated by steep terrain, avalanche chutes, and rocky shorelines. The steep slopes and narrow shoreline result in very few palustrine wetlands along this section of coastline. Within the highway corridor, only two stands of forested wetlands (1375-1, 1360-1; Figure 11) are delineated along this entire sub-region, near Independence Lake, north of Sherman Creek.

Rocky shores and unconsolidated shores (E2RS2N, E2RS2N/E2US1N) occur all along this sub-region and are generally represented by three wetland polygons (1300-1, 1380-1, 1480-1; Figures 11 through 17). The actual area and extent of each type are necessarily imprecise because of the very steep terrain and irregular shoreline.

One estuarine emergent wetland (E2EM1N) is located along the south side of the Katzeihin River (2590-1; Figure 17). This wetland is rated as high for nutrient transformation/export, riparian support, and wildlife habitat functions. Regional ecological diversity and replacement cost also received a high rating.

3.2.4 East Lynn Canal Sub-Region 4

This sub-region stretches from the northern bank of the Katzeihin River, across the Katzeihin River outwash plain, and along the shoreline of East Lynn Canal to Skagway (Figures 17 through 23). Approaching Skagway, the alignment follows a high ridge south of Skagway, near Lower Dewey Lake.

Katzeihin River Delta – Estuarine emergent wetlands or salt marsh habitats (E2EM1N) are found along the north side of the Katzeihin River and extend along the entire mid- to lower-tide levels of the outwash plain. A narrow band of irregularly flooded salt marsh habitat (E2EM1P) is found at a slightly higher elevation between the flats and the uplands (2670-1, 2690-1, 2735-1, and 2750-1; Figure 18). This wetland appears to have received river floodwaters in the past but on an infrequent basis. Beach bar habitats (E2BB1P) also occur on the northern portion of the delta (2735-2; Figure 18). Salt marsh habitats are rated high for wildlife habitat functions but are too infrequently flooded to provide fish habitat.

Katzehin Ferry Terminal Location – The Katzehin Ferry Terminal site is located on an area of estuarine rocky shoreline (E2RS2N) (2745-T and 2765-1; Figure 18) at the northern extent of the outwash plain. Similar to other ferry terminal sites, the terminal extends into the subtidal habitat, which is described in detail in the *EFH Assessment*. Functions for the intertidal rocky shore at this site are rated high for fish and wildlife habitats, similar to other marine sites.

Coastline from Katzehin Ferry Terminal to Skagway – The coastline between the Katzehin Ferry Terminal and Skagway is similar to the coastline in Sub-Region 3, with steep terrain and a very rugged, rocky shoreline. Palustrine wetlands do not occur to any extent in the narrow band of land along the shore within the highway corridor. Rocky shores are delineated in several areas where they would potentially be affected by a highway along the area (2765-1 to 3580-1; Figures 18 through 23).

Skagway – A few small, isolated palustrine emergent and scrub-shrub wetlands are found in small depressions along the highway corridor (3560-1 and 3565-1; Figure 23). One relatively large lake, Lower Dewey Lake, is situated east of the highway corridor (Figure 23). Steep rocky shores extend along the entire coast in the sub-region from the Katzehin River outwash plain to Skagway. No salt marsh habitats occur in this sub-region.

3.2.5 West Lynn Canal Sub-Region 1

This sub-region extends from William Henry Bay to the southern extent of the Davidson Glacier outwash plain. Palustrine wetlands are generally less common along West Lynn Canal in comparison to the southern portions of the East Lynn Canal alignment.

William Henry Bay – At the shore-side portion of the ferry terminal site, a forested wetlands occurs on a narrow bench above the beach and extends up the slope of a small emergent wetland in an area of groundwater seepage (4040-2; Figure 24). Only one other palustrine emergent wetland (4135-1; Figure 24) is encountered between the terminal site and the Endicott River.

William Henry Bay Ferry Terminal – The shoreline at the terminal site is mostly boulder/cobble with bedrock outcrops and is classified in the Cowardin system as estuarine rocky shore (E2RS2N) (4030-T; Figure 24). The intertidal zone comes up to the base of the cliff behind the site with little upper beach habitat. Similar to other marine sites, this area is rated high for fish habitat function based on both anadromous and marine fish species presence, but moderate to low for wildlife habitat functions. Regional ecological diversity is rated high.

Endicott River – The Endicott River occupies a broad, braided river flat, but the well-drained alluvial material of the outwash plain appears to limit development of palustrine wetlands (4315-1; Figure 25). Riverine systems along this sub-region are discussed further in the *EFH Assessment*.

Between the Endicott River and the Davidson Glacier outwash plain, forested wetlands are encountered at four locations, typically in areas of groundwater discharge (4410-1 4880-2, 4940-1 and 4940-2; Figures 25 through 28). The largest (4880-2; Figure 28) is on a low hillside just north of the Sullivan River, above the outwash plain, and is unusual in that it supports relatively large trees and is rated high for nutrient transformation due to the amount of flowing surface water through this stand. Wildlife habitat function is also rated high based on habitat. Regional ecological diversity is also rated as high.

Rocky shores (E2RS2N) and unconsolidated shores (E2US1N) occur along most of the coastline in this sub-region. Salt marsh habitats (E2EM1P) are relatively uncommon along this coastline and are generally confined to the mouths of rivers and streams.

3.2.6 West Lynn Canal Sub-Region 2

This relatively small sub-region extends across the broad outwash plain of the Davidson Glacier.

Davidson Glacier Outwash Plain – The Glacier River bisects this large outwash plain in a deeply incised channel. The uneven terrain of the outwash plain supports numerous small ponds or kettles, often a result of icebergs that are stranded when the glacier retreats (Figures 31 and 32). These depressions now support a wide variety of emergent wetlands or aquatic bed communities. Twenty-three relatively small wetlands and water bodies that exist within this sub-region were delineated in the field within the proposed highway corridor (July 2003 alignment). The number of unique wetlands identified in the field led to a realignment of the proposed highway route in order to minimize impacts on these wetlands. Wetlands types include emergent wetlands, ponds with emergent vegetation, ponds with floating vegetation, and open water habitats. The wetlands are generally rated as high to moderate for groundwater functions, high for surface hydrologic control, and high for nutrient transformation/export. One wetland (5595-1; Figure 31) is rated as high for wildlife. Ecological replacement costs are considered moderate to low for most of these small wetlands.

Beavers have also dammed a small drainage within the highway corridor on the north side of the Davidson Glacier outwash plain and a swath of trees have died as a result of the inundation, thus creating a large dead tree swamp (5645-1; Figure 32).

At the northern extent of the outwash plain, there is a series of seasonally flooded palustrine wetlands. Groundwater functions for these wetlands are rated high to moderate.

Estuarine emergent wetlands and beach bars occur along the entire outside fringe of the outwash plain but do not occur within the highway corridor surveyed for this project.

3.2.7 West Lynn Canal Sub-Region 3

This sub-region extends from the northern portions of the Davidson Glacier outwash plain to the end of the West Lynn Canal Highway at Mud Bay Road. One small forested wetland and an emergent wetland within a small drainage are the only palustrine wetlands within the corridor of this sub-region (5670-1 and 5660-3; Figure 32).

Chilkat River Crossing – Under Alternative 3, a bridge would span the Chilkat River (E1UBL) to Pyramid Island (6040-1; Figures 33 and 34) and onto land at Mud Bay Road, south of Haines. Marine areas that would be traversed by the bridge provide fish and wildlife habitat functions based on the presence of anadromous fish, bald eagle, and harbor seal, as is the case with most shoreline in this region.

3.3 Ground-Verification

On the east and west side of Lynn Canal, all NWI delineated wetlands were located within the study corridor covered by the field survey. Wetlands that do not appear on NWI maps, but were identified during 2003 field surveys or wetlands aerial interpretation are listed in Table 3-2.

Field surveys document the following upland areas that were identified as wetlands on the NWI maps of the east side of Lynn Canal:

- An NWI palustrine deciduous forested/deciduous scrub-shrub wetland indicated on the north shore of the Antler and Gilkey River confluence (Station 700+00) was field verified as a closed mixed forest (data sheet 705-1).
- NWI palustrine scrub-shrub/emergent wetlands near Stations 2630+00, 2680+00, and 2690+00 were field verified as herbaceous mesic forb uplands (data sheets 2630-1 and 2630-2).
- One NWI palustrine emergent wetland near Station 2670+00 was verified as a bryoid moss/lichen upland area (data sheet 2665-1).

Table 3-1
Location of Project Area Sub-Regions – Wetland Field Survey

Sub-Regions	From Figure to Figure		Description
East Lynn Canal			
Sub-Region 1	Figure 1	Figure 7	Echo Cove to Slate Cove
Sub-Region 2	Figure 8	Figure 10	Slate Cove to Sherman Point
Sub-Region 3	Figure 10	Figure 17	Sherman Point to Katzeihin River
Sub-Region 4	Figure 17	Figure 23	Katzeihin River to Skagway
West Lynn Canal			
Sub-Region 1	Figure 24	Figure 30	William Henry Bay to Davidson Glacier Outwash
Sub-Region 2	Figure 31	Figure 32	Davidson Glacier Outwash
Sub-Region 3	Figure 32	Figure 34	Davidson Glacier Outwash to Haines (Mud Bay Road)

Table 3-2
Additional Wetlands Not Appearing on NWI Maps

Sub-Region	ID Method	Wetland ID	Total Area (Acres)
East Lynn Canal			
East Sub-Region 1	Cascade Point EIS	115-1	2.70
East Sub-Region 1	Cascade Point EIS	125-1	1.70
East Sub-Region 1	Cascade Point EIS	135-1	2.44
East Sub-Region 1	Cascade Point EIS	150-1	22.58
East Sub-Region 1	Cascade Point EIS	165-1	44.46
East Sub-Region 1	Cascade Point EIS	190-1	2.24
East Sub-Region 1	Cascade Point EIS	195-1	1.88
East Sub-Region 1	Cascade Point EIS	200-1	1.28
East Sub-Region 1	Cascade Point EIS	235-1	3.20
East Sub-Region 1	Cascade Point EIS	265-1	6.11
East Sub-Region 1	Field survey	415-1	67.91
East Sub-Region 1	Field survey	830-2	2.54
East Sub-Region 2	Air photo interpretation	920-1	0.58
East Sub-Region 2	Air photo interpretation	975-1	1.83
East Sub-Region 2	Air photo interpretation	990-1	39.04
East Sub-Region 2	Air photo interpretation	1010-1	1.13
East Sub-Region 2	Air photo interpretation	1015-1	2.80
East Sub-Region 2	Air photo interpretation	1020-1	6.04
East Sub-Region 3	Air photo interpretation	1070-1	8.45
East Sub-Region 3	Air photo interpretation	1110-1	2.30
East Sub-Region 3	Air photo interpretation	1260-1	30.07
East Sub-Region 4	Air photo interpretation	3560-1	0.17
East Sub-Region 4	Air photo interpretation	3565-1	0.15
West Lynn Canal			
West Sub-Region 1	Field survey	4040-2	21.86
West Sub-Region 1	Air photo interpretation	4940-1	62.16
West Sub-Region 1	Air photo interpretation	4135-1	4.27
West Sub-Region 2	Air photo interpretation	5645-1	10.12
West Sub-Region 2	Air photo interpretation	5570-2	2.25
West Sub-Region 2	Field survey	5575-1	0.51
West Sub-Region 2	Air photo interpretation	5580-1	0.2
West Sub-Region 2	Air photo interpretation	5595-2	0.17
West Sub-Region 2	Air photo interpretation	5570-1	0.08
West Sub-Region 2	Air photo interpretation	5580-2	0.56
West Sub-Region 2	Field survey	5640-2	0.24
West Sub-Region 3	Air photo interpretation	5670-1	8.05

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4.0 ENVIRONMENTAL CONSEQUENCES OF THE BUILD ALTERNATIVES

This technical report considers the direct effects of the Juneau Access Improvements Project alternatives on waters of the U.S., including wetlands. As defined by 40 CFR 1808.8(a), in accordance with the NEPA, direct effects are those that result from the action and occur at the same time and place.

Direct Impacts – Direct impacts considered in this assessment include the impacts from construction, maintenance, and operation activities. Direct impacts are largely driven by the direct loss of wetlands and other waters of the U.S. (except rivers and streams) as a result of placement of fill for construction of the highway and ferry terminal sites and the loss of the wetland ecological functions. Wetlands that occur outside the cut and fill footprint may also be impacted, mainly due to changes in hydrology resulting from the fill. Direct impacts associated with fill are presented for East Lynn Canal in Table 4-1 and for West Lynn Canal in Table 4-2. A comparison of direct impacts among build alternatives is presented in Table 4-3. While the effects are not rated as far as significance under NEPA, criteria for rating whether a loss is significant or not has been developed and is presented in the *Indirect and Cumulative Effects Analysis Report*.

Included in this analysis are the highway alignments and ferry terminals for the “build” alternatives based on preliminary cut and fill limits. No wetland material site locations, disposal areas, construction camps, access roads, or pull-outs are considered in this analysis because there are sufficient upland areas around highway alignments and ferry terminals to accommodate these needs. Deepwater rock disposal sites are considered in the *EFH Assessment*. Beach landing areas will be identified, as needed, during final design of the chosen alternative.

Impacts on rivers and streams, including vegetated or unvegetated river bars and flats, are not addressed in this analysis, but are discussed in the *Anadromous and Resident Fish Streams Technical Report* and *EFH Assessment*. Depending on the chosen alternative, rivers and streams would be spanned with either bridge structures (all anadromous streams) or appropriately sized culverts.

Ferry terminal construction at Sawmill Cove, Slate Cove, the Katzeihin River area, and William Henry Bay would require in-water fill in marine waters and piles driven in subtidal waters. Impacts of these activities on fish habitat are discussed in the *EFH Assessment*.

Impacts to Functions and Values – Impacts to wetland functions and values were analyzed for each wetland or marine area affected by any of the proposed alignments, and are presented for both East Lynn Canal and West Lynn Canal (Tables 4-4 and 4-5). The functions and values impacted by construction activities under the various alternatives are highlighted in the following sections, where appropriate.

Wetlands Avoidance and Minimization – Avoidance and minimization of wetland impacts have been incorporated into the design of the route alignments to the extent feasible. Difficult terrain, eagle trees, and areas of extensive wetlands coverage (i.e., Slate Cove to Sherman Point) limit the options for avoidance of wetlands. The highway alignments developed in July 2003 were further realigned in October, November, and December 2003 after on-site investigations revealed opportunities to avoid specific wetlands. Additional small refinements to the alignments were made in November 2003. Further alignment changes to avoid wetland

impacts would be made during the permitting process based on agency input and detailed design information.

Impacts resulting from construction and maintenance and operations of highways and ferry terminals are evaluated with the assumption that the following measures and Best Management Practices (BMPs) will be instituted.

Construction Measures

- Minimize area and duration of the disturbance
- Limit the access of construction machinery outside of the fill area
- Employ appropriate machinery and methods of transport of the material for discharge
- Use machinery and techniques that are designed to reduce damage to wetlands, including machines equipped with devices that scatter rather than mound excavated materials, machines with specially designed wheels or tracks, and the use of mats under heavy machines to reduce wetland surface compaction and rutting
- Minimize highway run-off and sediment transport through perimeter-control practices and retention (e.g., silt fencing)
- Minimize velocities of unavoidable run-off (e.g., placement of bales)
- Minimize erosion with berms, brush barriers, erosion-control blankets, etc.
- Salvage native plant materials for reclamation and erosion control on sides of highway
- Use site soils and native plants in an effort to reduce the risk of introducing non-native species into the ecosystem
- Revegetate sides of highway with native vegetation (e.g., sedges, rushes, grasses) for reclamation, erosion control, and to provide habitat and enhance beauty
- Use surface drainage techniques, such as crowning, insloping, and outsloping to maintain natural hydrology
- Design access roads and channel spanning structures using culverts, open channels, and diversions that will pass both low and high water flows, accommodate fluctuating water levels, and maintain circulation and faunal movement
- Design cross-drainage structures that allow for both surface and subsurface flow in areas of deep organic material

Maintenance and Operations Measures

- Minimize area and duration of the disturbance
- Avoid use of fertilizers and pesticides, especially when there is a high probability of rain
- Minimize degree to which sand, salt, etc. enter surface and ground water
- Minimize highway run-off and sediment transport through perimeter-control practices and retention (e.g., silt fencing)
- Minimize velocities of unavoidable run-off
- Minimize erosion with berms, brush barriers, erosion-control blankets, etc.

- Divert overbank flow using berms, swales, or ditches to channel water to pipes that provide non-erosive passage of the flow
- Provide signage or other means of restricting access to vehicles or foot traffic off the main highway to avoid further wetland, freshwater, or marine intertidal area degradation

4.1 Alternative 2 (Preferred) – East Lynn Canal Highway with Katzeihin Ferry Terminal

This alternative includes extending the Glacier Highway from Echo Cove to Skagway along the east side of Lynn Canal, with ferry service provided to Haines by a shuttle ferry from a new terminal site north of the Katzeihin River. This alternative would have the greatest impact on wetland and marine sites of the alternatives analyzed. Construction of the highway under this alternative would require placement of fill in wetlands and marine areas totaling 118.6 acres within the footprint of the proposed highway and the ferry terminal at Katzeihin. Of this total, 86.9 acres are palustrine wetlands, primarily forested wetlands, 5.5 acres are estuarine emergent wetlands, and 26.2 acres are non-vegetated marine areas, consisting primarily of rocky shores.

4.1.1 East Lynn Canal Sub-Region 1 – Berners Bay

4.1.1.1 Footprint Acreage

Portions of 18 individual wetlands would be filled to construct a highway from the mouth of Echo Cove to the Slate Creek drainage. Forested wetlands will be impacted the most (19.1 acres, of which 12.4 acres are needle-leaved evergreen and 6.7 are deciduous forested wetlands). Most of the forested needle-leaved wetlands (PFO4B) occur between Echo Cove and Sawmill Creek (Figures 3 and 4). Deciduous forested wetlands (PFO1A and PFO1A/PSS1A) are adjacent to the Antler and Lace/Berners rivers (680-2 and 735-4; Figures 6 and 7). Loss of palustrine emergent wetlands would constitute 3.4 acres (Figures 3 through 7). Loss of a scrub-shrub/forested wetland would constitute 0.7 acres (340-1; Figure 4). Table 4-1 presents the total fill areas for East Lynn Canal Sub-Region 1. Regular maintenance and operation activities that would occur following the completion of the highway would not be expected to result in the fill of additional wetlands.

Fill for the highway and bridges at the head of Berners Bay will affect no estuarine emergent (salt marsh) habitat or intertidal flats. The October 2003 realignment of the highway through this area reduced the amount of wetland fill by approximately 3.1 acres for emergent wetlands and 2.9 acres for salt marsh. The December 2003 realignment of the bridge and the highway approach to the bridge was shifted farther upriver to avoid impacts to the salt marsh; this eliminated the remainder of the 4.4 acres potentially affected by the October 2003 alignment (735-1; Figures 6 and 7).

4.1.1.2 Impacts to Wetland Functions and Values

Impacts to functions and values for each individual wetland on the east side of Lynn Canal are presented in Table 4-4. The proposed highway would act as a partial barrier to the flow of shallow groundwater and surface water. Shallow groundwater blocked by the highway bed would eventually flow to the surface and be diverted by ditches to culvert under the roadbed. This diversion would adequately maintain water's natural down-gradient flow. Culvert end sections or rock dissipaters would be used to disperse high volume/velocity outfall to protect soils and vegetation below culvert outfalls from erosion of adjacent wetlands. The diversion of water into culverts and roadside ditches could disrupt water flow to some downslope wetlands and alter wetland hydrology; however, the high volume of annual rainfall in this region could

reduce the magnitude of any impacts to wetland hydrology. Alteration of hydrology because of the roadbed could result in corresponding changes to the vegetation and, over time, affect wetland functions. The extent of this direct effect would depend on the location, but could potentially extend beyond the right-of-way. These effects could be minimized by adequate design of cross-drainage structures and ditching.

The loss of forested wetlands from fill for the highway would modify the groundwater recharge functions, the groundwater discharge/lateral flow functions, and the surface hydrologic control functions of these wetlands. The remaining portions of these forested wetlands, and the wetlands in unaffected areas outside the highway corridor, would continue to provide these functions. Proper ditches and drainage structures under the highway would minimize effects on the hydrologic functions of these wetlands.

Fill of emergent scrub-shrub wetlands in this sub-region (wetlands 420-4 and 440-1, Figure 5) would modify groundwater discharge functions, surface hydrologic control functions. Loss of portions of these wetlands is not expected to substantially reduce each wetland's ability to provide these functions.

Only one emergent wetland with high wildlife value is impacted from Echo Cove to the Slate Creek drainage (735-2, Figure 7, Table B-1). The size of this wetland is approximately 31.19 acres of which less than one percent (0.10 acres) would be filled (Table 4-4). This wetland has a high value because existing survey data indicate that this wetland is used by water fowl and shorebirds and/or a high number of great blue heron, Vancouver Canada goose, mallard, or bald eagle relative to other similar wetlands in the area (USFWS, 2003). Two emergent scrub shrub wetlands are rated as having moderate-high wildlife habitat value (wetlands 420-4 and 440-1, Figure 5). Wetland 420-1 is approximately 13.38 acres of which six percent (0.72 acres) would be filled and Wetland 440-1 is approximately 6.63 acres of which 30 percent (2.06 acres) would be filled (table 4-4). These wetlands have a moderate-high value because permanently flooded fresh emergent marsh is present and the wetlands are adjacent to spruce/hemlock forest, which provides food and water with nearby cover for terrestrial animals such as bear and moose. All other wetlands impacted by Alternative 2 in this sub-region have a moderate-low to low wildlife habitat value (Table B-1 and Appendix D). A further discussion on wildlife habitat impacts is included in the *Wildlife Technical Report*.

The salt marshes (Figures 6, 7, and 8) at the head of Berners Bay adjacent to the Antler, Lace, and Berners River and at the head of Slate Cove provide a wildlife habitat function. The Alternative 2 alignment does not directly impact the salt marsh wetlands; however the highway alignment has the potential to impact terrestrial wildlife movement between the salt marsh areas and adjacent uplands. A further discussion of potential wildlife corridor impacts is included in the *Wildlife Technical Report*.

It is important to note that the marine intertidal area adjacent to the shoreline from Echo Cove to south of the Antler River area is herring spawning habitat (personal communication, M. Ingle, January 2004.) There are no direct marine intertidal impacts occurring along this segment of the shoreline for Alternative 2. A discussion of potential impacts to herring spawning habitat is presented in the *EFH Assessment*.

Contaminants, including oils, fuels, sediment, and debris can be introduced to the ecosystem during construction activities. These pollutants often settle in wetlands, but can move downstream when re-suspended. The introduction of contaminants and excess sediment loading can be avoided with implementation of BMPs. Contaminant concentrations in runoff from the proposed highway would not be expected to exceed Alaska Water Quality Standards

(AWQS) or adversely impact the water quality of receiving waters for the long-term. Invasive plant species can also be introduced during construction activities. DOT&PF and FHWA regulations require construction contractors to utilize specific techniques and procedures to minimize the accidental introduction of foreign plant species carried on construction equipment and to use native or non-invasive plant species for hydro-seeding of exposed embankments. Compliance with these BMPs should minimize the risk of introducing foreign plant species to the highway corridor and thus minimize the chance of causing wildlife habitat loss through this mechanism related to construction activities.

The use of salt treated abrasives (sand and 3-5 percent salt) to improve road conditions could potentially affect roadside vegetation (Stormwater, 2001). High rainfall in this region would minimize any impact from road salt. Most soil and vegetation damage from sand or salt is localized to within 60 feet of the road, with the greatest impacts right next to the pavement (U.S. Roads, 1997). Salt treated abrasives would be used minimally along the highway route; thus, negligible impacts on adjacent vegetation would be expected.

4.1.2 East Lynn Canal Sub-Region 2 – Slate Cove to Sherman Point

4.1.2.1 Footprint Acreage

Under Alternative 2, the highway alignment from Slate Cove to Sherman Point will impact primarily palustrine wetlands; the alignment does not contact the shoreline. Forested wetlands dominate the land cover in this region. Of the 62.4 acres of potential wetlands fill in this sub-region, approximately 95 percent (59.2) would be forested wetlands (Table 4-1). Only 3.2 acres of emergent wetlands (PEM1B/PSS4B) would be filled, and these are associated with open fens and muskegs (Table 4-1).

4.1.2.2 Impacts to Wetland Functions and Values

Excavation or fill of wetlands for construction of the highway would intersect the drainage patterns of most of the wetlands in this sub-region. Impacts will include modifying the groundwater recharge functions, the discharge/lateral flow functions, the surface hydrologic control functions, and the sediment retention functions of these wetlands. Expanses of similar habitat in the surrounding areas, and adequate ditching and drainage structures, will moderate losses of any of these functions.

Wildlife habitat for eight wetlands in this subsection is rated as a moderate-high value (wetlands 910-2, 920-1, 1010-1, 1040-1, 1110-1, 1185-1, 1220-1, and 1070-1; Figures 8 and 9; Table B-1). The approximate total acreage of these wetlands is 268.34 acres of which six percent (17.05 acres) are impacted. These wetlands have a moderate-high value because permanent standing fresh or brackish water or permanently flooded emergent marsh is present (emergent wetlands) and the wetlands are adjacent to spruce/hemlock forest or deciduous scrub-shrub (forested and scrub-shrub wetlands), which provides food and water with nearby cover for terrestrial animals such as bear. All other wetlands impacted by Alternative 2 in this sub-region have a moderate-low to low wildlife habitat value (Table B-1 and Appendix D). A further discussion on wildlife habitat impacts is included in the *Wildlife Technical Report*.

Regional ecological diversity will not likely be substantially affected by the loss of wetlands in this sub-region since these wetlands are very common and widespread throughout the surrounding area. The highway alignment avoids the seasonally flooded emergent/scrub-shrub wetland along this area. Replacement cost is considered high for the forested wetlands and high to moderate for the emergent/scrub-shrub wetlands.

4.1.3 East Lynn Canal Sub-Region 3 – Sherman Point to Katzechin River

4.1.3.1 Footprint Acreage

Construction along this segment would affect 1.3 acres of forested wetlands, occurring just north of Sherman Creek, in the southern portion of this sub-region. Estuarine rocky shores and unconsolidated beaches along this sub-region will be affected by direct fill for the highway. The impact of this activity is discussed in the *EFH Assessment*. Approximately 94 percent of all of the rocky shoreline impacts for Alternative 2 are in this sub-region. Fill during construction will affect numerous small areas of marine habitat (a minimum of 17 sites), for a total amount of 19.2 acres. One small salt marsh area (2590-1; Figure 17) located south of the Katzechin River will be impacted by highway construction, but total fill area will be less than 1 acre (Table B-1).

4.1.3.2 Impacts to Wetland Functions and Values

The loss of 1.3 acres of forested wetland (1360-1; Figure 11) near Independence Lake will have minimal effect on groundwater function since the highway would pass through the lower portion of the wetland. Surface hydrologic control would also likely be modified. Erosion sensitivity of this wetland will be low and not substantially affected by the highway.

One wetland in this sub-region has a high wildlife habitat value (2590-1, Table B-1). Approximately 0.79 acres of this wetland would be impacted (Figure 17; this wetland was interpreted from aerial photography therefore the total acreage of this wetland has not been ground truthed). Lyngbye's sedge, seaside plantain, seaside arrow-grass, or ditch grass have a high probability of occurring in this wetland; therefore, it is rated as having high wildlife habitat value for its food value for migrating waterfowl and terrestrial species such as brown and black bear. All other wetlands impacted by Alternative 2 in this sub-region have a moderate-low wildlife habitat value (Table B-1 and Appendix D). A further discussion on wildlife habitat impacts is included in the *Wildlife Technical Report*.

The salt marsh (2590-1, Figures 17) on the southern bank of the Katzechin River provides a wildlife habitat function. The Alternative 2 alignment directly impacts 0.79 acres of the salt marsh wetlands and highway alignment has the potential to impact terrestrial wildlife movement between the salt marsh areas and adjacent uplands. A further discussion of potential wildlife corridor impacts is included in the *Wildlife Technical Report*.

There are two intertidal marine areas in this sub-region that are rated high for fish habitat (1380-1 and 1480-1, Table B-1). Approximately 0.57 acres of 1380-1 and 18.67 acres of 1480-1 would be impacted (Figure 12; this wetland was interpreted from aerial photography therefore the total acreage of this wetland has not been ground truthed). Impacts to fish habitat associated with this fill are discussed in the *EFH Assessment*.

4.1.4 East Lynn Canal Sub-Region 4 – Katzechin River to Skagway

4.1.4.1 Footprint Acreage

Within this sub-region, no palustrine wetlands occur to any extent within the corridor surveyed for the proposed highway (Table B-1). Estuarine emergent wetlands will be impacted along the Katzechin River at the river crossing and along the upper levels of the large flats on the north side of the delta (Figures 17 and 18). Approximately 4.7 acres of salt marsh will be filled for highway construction and ferry terminal development.

Rocky shore and beach bar fill areas along this portion of the highway are relatively small, with total area affected being approximately 7.0 acres. Additionally, dredge and fill for the Katzeihin Ferry Terminal will require approximately 7.0 acres of rocky shoreline habitat for breakwaters and terminal facilities. Approximately 4.5 acres of subtidal will likely have to be dredged but this area is not included in the total (see the *EFH Assessment*).

4.1.4.2 Impacts to Wetland Functions and Values

Fill of estuarine emergent wetlands (2690-1; Figure 18) on this portion of the outwash plain will modify the surface hydrologic control functions, and reduce riparian support. Salt marsh habitat on the Katzeihin River outwash plain is quite extensive and the portion of the salt marsh potentially affected by the highway is a narrow band located at the highest level of the marsh.

Wildlife habitat value for four emergent wetlands is rated as high (wetlands 2690-1, 2630-1, 2735-1, and 2750-1; Table B-1). The total impact to these wetlands due to fill is approximately 2.16 acres (Figures 17 and 18; these wetlands have not been ground truthed for size). Wildlife habitat is also rated as high for one estuarine beach bar area (2735-2, Table B-1). The estuarine beach bar area is approximately 1.87 acres of which 71 percent (1.33 acres) would be impacted (Table 4-4). These wetlands are rated as having a high wildlife habitat value because Lyngbye's sedge, seaside plantain, seaside arrow-grass, or ditch grass occur, which provides food for migrating waterfowl and terrestrial species such as brown and black bear. A further discussion on wildlife habitat impacts is included in the *Wildlife Technical Report*.

The salt marshes north of the Katzeihin River provide a wildlife habitat function. The Alternative 2 alignment has the potential to impact terrestrial wildlife movement between the salt marsh areas and adjacent uplands (2630-1, 2670-1, 2690-1, and 2735-1; Figures 17 and 18). A further discussion of potential wildlife corridor impacts is included in the *Wildlife Technical Report*.

Marine intertidal areas with high fish habitat values would be impacted due to the Katzeihin Ferry Terminal associated with Alternative 2 (2745-T, 2765-1, 2800-1, 3000-1, and 3300-1; Table B-1). Approximately 5.65 acres would be impacted (Figure 18; this wetland was interpreted from aerial photography therefore the total acreage of this wetland has not been ground truthed). Impacts to fish habitat associated with this fill are discussed in the *EFH Assessment*.

4.2 Alternative 2A – East Lynn Canal Highway with Berners Bay Shuttles

4.2.1 Footprint Acreage

Under this alternative, no highway would be constructed around Berners Bay; therefore, no fill would be placed in the wetlands or marine areas within the Berners Bay watershed between Sawmill Cove and Slate Cove, including the large wetlands at the mouth of the Antler or Lace/Berners rivers. Bypassing the head of Berners Bay will eliminate the need to fill 3.4 acres of palustrine emergent wetlands and 17.8 acres of forested wetlands. Including the fill for ferry terminals at Sawmill Cove and Slate Cove, Alternative 2A will result in an 18.3-acre reduction compared with Alternative 2 (Table 4-1). Total area of fill of wetlands and marine sites will be approximately 100.4 acres.

Sawmill Cove Ferry Terminal Site – The Sawmill Cove Ferry Terminal site will require approximately 1.9 acres of fill of rocky shoreline and possibly some subtidal habitat. Approximately 1.3 acres of subtidal habitat will likely have to be dredged, but this area is not included in the total (see *EFH Assessment*).

Slate Cove Ferry Terminal Site – The Slate Cove Ferry Terminal Site will affect approximately 1.1 acres of intertidal beach bar. Approximately 1.9 acres of forested wetlands will be required for the access road to the ferry terminal.

Katzehin Ferry Terminal Site – The fill associated with the Katzehin Ferry Terminal site includes 4.3 acres of rocky shores and 2.5 acres of estuarine emergent wetlands, with an additional 4.5 acres of dredging to accommodate the ferry vessels, similar to Alternative 2.

4.2.2 Impacts to Wetland Functions and Values

The impacts to wetland functions and values for Alternative 2A are the same as for Alternative 2 with the following exceptions. Impacts of fill on wetlands functions for the Sawmill Cove Ferry Terminal be primarily to wildlife and fish habitat functions, which are rate as high. Impacts of fill on wetland functions for the Slate Cove Ferry would also affect wildlife and fish habitat is a similar manner. Impacts of fill on wetland functions for the Sawmill Cover and Slate Cove Ferry Terminal access highways include modification of groundwater recharge functions, groundwater discharge/lateral flow functions, and sediment retention, and riparian support functions.

This alternative does not impact the Berners Bay wetlands with high (735-2) and moderate-high (420-1 and 440-1) wildlife habitat values. Sawmill Cove and Slate Cove have high wildlife habitat values. These two areas are rated as high because existing survey data indicate that the area is frequently used by waterfowl and shorebirds and/or a high number of great blue heron, Vancouver Canada geese, mallard, or bald eagle relative to other similar wetlands in the area. A further discussion on wildlife habitat impacts is included in the *Wildlife Technical Report*.

The salt marsh (Figure 8) at the head of Slate Cove provides a wildlife habitat function. The Alternative 2A alignment does not directly impact the salt marsh wetland; however the highway alignment has the potential to impact terrestrial wildlife movement between the salt marsh area and adjacent uplands. A further discussion of potential wildlife corridor impacts is included in the *Wildlife Technical Report*.

The placement of fill on intertidal habitat at Sawmill Cove and Slate Cove will modify fish habitat. Sawmill Cove contains herring spawning habitat. The impacts to fish habitat is discussed in the *Anadromous and Resident Fish Streams Technical Report* and the *EFH Assessment*.

4.3 Alternative 2B – East Lynn Canal Highway to Katzehin with Shuttles to Haines and Skagway

4.3.1 Footprint Acreage

Under this alternative, the alignment is the same as Alternative 2, but ends at the Katzehin Ferry Terminal, thus eliminating the highway from Katzehin to Skagway.

Total acreage impacted under this alternative will be 118.6 acres. Since no palustrine wetlands occur within the highway corridor along Katzehin to Skagway segment, fill of wetlands would be essentially the same as under Alternative 2 (92.4 acres). Fill of rocky shores, in comparison to Alternative 2, is reduced by 1.9 acres (Table 4-1).

4.3.2 Impacts to Wetland Functions and Values

Impacts to functions of estuarine rocky shores and beach bars will be similar to those discussed under Alternative 2, except for a slight reduction in the total area affected. Impact on functions of other wetlands and marine sites along the Alternative 2B alignment would be the same as described for Alternative 2 (Table 4-4 and Table B-1).

4.4 Alternative 2C – East Lynn Canal Highway with Haines/Skagway Shuttle

4.4.1 Footprint Acreage

This alternative is the same as Alternative 2 in that a highway will be constructed along the East Lynn Canal from Echo Cove to Skagway. The alternative requires the same amount of fill of wetlands and marine sites as Alternative 2 for highway construction; however, the marine fill at the Katzeihin Ferry Terminal site would not be required. Eliminating this terminal site would reduce the total marine and subtidal fill to approximately 21.9 total acres. Also, dredging of approximately 4.5 acres of subtidal habitat to accommodate ferry vessels would no longer be required (see *EFH Assessment*).

4.4.2 Impacts to Wetland Functions and Values

Impacts to wetlands functions will be essentially the same as under Alternative 2, except the Katzeihin Ferry Terminal would not be built. Therefore, impacts to the fish and wildlife habitat functions at the ferry terminal will not occur.

4.5 Alternative 3 – West Lynn Canal Highway

Alternative 3 consists of extending the Glacier Highway from Echo Cove to Sawmill Cove, and constructing new ferry terminals at Sawmill Cove and William Henry Bay. A shuttle ferry would cross Lynn Canal between Sawmill Cove and William Henry Bay, and a highway would be constructed from William Henry Bay to Haines. Total area of wetland and marine fill for this alternative would be 47.3 acres, which includes 35.5 acres of wetlands and 11.6 acres of marine areas. A small amount of vegetated shallows associated with small ponds would also be filled (0.2 acres).

4.5.1 Echo Cove to Sawmill Cove Ferry Terminal

4.5.1.1 Footprint Acreage

Fill of wetlands and marine areas from Echo Bay to the Sawmill Cove Ferry Terminal would include 10.3 acres of forested wetlands, 0.7 acres of scrub-shrub/forested wetland, 0.01 acres of palustrine emergent wetlands, and 1.9 acres of rocky shore intertidal habitat. Additionally, 1.9 acres of subtidal dredging for the ferry terminal would be required.

4.5.1.2 Impacts to Wetland Functions and Values

The loss of forested wetlands from fill for the highway would modify the groundwater recharge functions, the groundwater discharge/lateral flow functions, and the surface hydrologic control functions of these wetlands. The remaining portions of these forested wetlands, and the wetlands in unaffected areas outside the highway corridor, would continue to provide these functions. Proper ditches and drainage structures under the highway would minimize effects on the hydrologic functions of these wetlands.

Sawmill Cove has high wildlife and fish habitat values. This area is rated as high because existing survey data indicate that the area is frequently used by waterfowl and shorebirds and/or a high number of great blue heron, Vancouver Canada geese, mallard, or bald eagle relative to other similar wetlands in the area. A further discussion on wildlife habitat impacts is included in the *Wildlife Technical Report*.

The placement of fill on intertidal habitat at Sawmill Cove will modify fish habitat. Sawmill Cove contains herring spawning habitat. The impacts to fish habitat is discussed in the *Anadromous and Resident Fish Streams Technical Report* and the *EFH Assessment*.

4.5.2 West Lynn Canal Sub-Region 1 – William Henry Bay to Davidson Glacier Outwash Plain

The alignment in this sub-region follows the coast north from William Henry Bay, crosses the Endicott and Sullivan river valleys to the southern edge of the Davidson Glacier outwash plain.

4.5.2.1 Footprint Acreage

Wetlands impacts within this sub-region include 18.7 acres of forested wetlands in five isolated stands and 1.9 acres of emergent wetlands (4135-1; Figure 24; Table B-2). At three locations, the highway alignment is forced toward the beach due to very steep terrain. In these areas, fill on the intertidal habitats includes 0.4 acres of salt marsh and 0.09 acres of beach bar habitat. An additional 4.8 acres of fill would also be required in intertidal rocky shores (E2RS2N) at the William Henry Bay Ferry Terminal site (4030-T; Figure 24).

4.5.2.2 Impacts to Wetland Functions and Values

Effects of highway construction on the forested wetlands include reduced groundwater recharge and groundwater discharge/lateral flow functions, modification of the surface hydrologic control, and a slight reduction in wildlife habitat function with the loss of forest habitat. One forested wetland (4880-1; Figure 28; Table B-2) is rated high for nutrient transformation/export due to the amount of surface water flowing through it. Impacts to functions of the emergent wetlands that would be filled would be modification of groundwater recharge, discharge and lateral flow, nutrient transport and riparian support (Table B-2).

One forested wetland is rated high for wildlife habitat value (4880-1; Figure 28; Table B-2). This wetland is approximately 198.25 acres of which two percent (5.33 acres) would be impacted (Table 4-5). This wetland has a high wildlife habitat value because large wetlands (>2 acres) dominated by emergent vegetation are adjacent to the forested wetland. These types of areas provide food, water, and cover for wildlife species (e.g., waterfowl and terrestrial animals). Emergent wetlands 4620-1 and 4900-1 are also rated as having high wildlife habitat value (Figures 26 and 28; Table B-2). Wetland 4620 is approximately 0.8 acres of which two percent (0.21 acres) would be impacted and wetland 4900-1 is approximately 17.28 acres of which less than one percent (0.17 acres) would be impacted. These two emergent wetlands have a high wildlife habitat value because Lyngbye's sedge, seaside plantain, seaside arrow-grass, or ditch grass occur, which provides food for migrating waterfowl and terrestrial species such as brown and black bear. A further discussion on wildlife habitat impacts is included in the *Wildlife Technical Report*.

The emergent wetlands at the mouth of the Endicott River (Figure 25; note this wetland was not delineated during the 2003 field survey; therefore, there is no data label), at the mouth of the Sullivan River (note this wetland area is not shown in figures; the wetland was not delineated during the 2003 field survey; therefore, there is no data label), and north of the Sullivan River

(4900-1, Figure 28) provide a wildlife habitat function. With the exception of wetland 4900-1 (0.17 acres), the Alternative 3 alignment does not directly impact these emergent wetlands; however the highway alignment has the potential to impact terrestrial wildlife movement between the wetland areas and adjacent uplands. A further discussion of potential wildlife corridor impacts is included in the *Wildlife Technical Report*.

Fish habitat at the marine fill at the William Henry Bay Ferry Terminal site (4030-T; Figure 24) is rated as high. The new terminal would modify the fish habitat in the nearshore area. Impacts to fish resources at this site are discussed in detail in the *EFH Assessment*.

4.5.3 West Lynn Canal Sub-Region 2 – Davidson Glacier Outwash Plain

4.5.3.1 Footprint Acreage

Most of the small wetlands associated with kettle ponds on the Davidson Glacier outwash plain have been avoided through the realignment in October 2003. However, two small isolated emergent wetlands (5560-1 and 5570-2; Figure 31) and a small pond with floating vegetation (5580-2; Figure 31) would be partially filled to construct the highway along the new alignment. These areas are quite small and the fill for the highway would affect approximately 0.6 acres of wetlands (0.4 acres of palustrine emergent wetlands and 0.2 acres of palustrine aquatic bed.) North of the Davidson River crossing, a 1.1-acre fill would be required across a portion of a newly created beaver pond (5645-1; Figure 32).

No marine areas would be affected in this sub-region.

4.5.3.2 Impacts to Wetland Functions and Values

Fill of portions of the three isolated wetlands (5560-1, 5570-2 and 5645-1; Figures 31 and 32; Table B-2) and a part of a pond (5580-2; Figure 31; Table B-2) would primarily modify the groundwater discharge and flow/lateral flow and sediment transport functions of these wetlands.

Wildlife habitat for the wetland 5645-1 is rated as high because the wetland contains > 2 contiguous acres of permanent standing fresh or brackish water and is adjacent to spruce/hemlock forest. This wetland is approximately 10.12 acres of which one percent (1.12 acres) would be impacted (Figure 32; Table 4-5). This type of habitat has a high value because it provides food, water, and cover for wildlife species (e.g., waterfowl and terrestrial animals). One aquatic bed wetland has a moderate-high wildlife habitat rating (5580-2; Table B-2). This wetland is approximately 0.56 acres of which three percent (0.17 acres) would be impacted. This wetland has a high rating because there is between 0.1 to 1.0 acres of standing water adjacent to spruce/hemlock forest and provides water and cover for wildlife species. All other wetlands impacted by Alternative 3 in this sub-region have a moderate-low wildlife habitat value (Table B-2 and Appendix D). A further discussion on wildlife habitat impacts is included in the *Wildlife Technical Report*.

The emergent wetlands along the coastline of the Davidson Glacier Outwash Plain (Figure 31 and 32; note these wetlands were not delineated during the 2003 field survey; therefore, there are no data labels) provide a wildlife habitat function. The Alternative 3 alignment does not directly impact these emergent wetlands; however the highway alignment has the potential to impact terrestrial wildlife movement between the wetland areas and adjacent uplands. A further discussion of potential wildlife corridor impacts is included in the *Wildlife Technical Report*.

4.5.4 West Lynn Canal Sub-Region 3 – Davidson Glacier Outwash Plain to Haines

4.5.4.1 Footprint Acreage

The only wetland area affected in the sub-region is a small, forested wetland (5670-1; Figure 32) located just north of the outwash plain. The highway would intersect the uphill portion of this wetland.

Placement of fill in marine areas within this sub-region would affect a total of 4.8 acres. This includes one location on the north side of Pyramid Island (6040-1; Figures 33 and 34) for construction of a solid fill causeway to protect the bridge abutments and to support this highway segment. At the Chilkat River crossing, approximately 1.1 acres of an estuarine emergent wetland (salt marsh 5980-1; Figure 33) would also need to be filled for the bridge abutment on the south side of Chilkat River.

4.5.4.2 Impacts on Wetland Functions and Values

Loss of a small portion of forested wetlands (5670-1; Figure 32) would likely modify the groundwater recharge function, groundwater discharge/lateral flow function, and riparian support functions at this location.

One emergent wetland has a high wildlife habitat function (5980-1; Table B-2). Approximately 1.11 acres would be impacted (Figure 33; note the total area of this wetland has not been determined). One beach bar marine intertidal area has a high wildlife habitat value (6040-1; Table B-2). Approximately 4.8 acres would be impacted (Figure 33; note the total area of this wetland has not been determined). These wetlands have high value wildlife habitat because Lyngbye's sedge, seaside plantain, seaside arrow-grass, or ditch grass occur, which provides food for migrating waterfowl and terrestrial species such as brown and black bear. In addition, 6040-1 is used as a haulout for harbor seals. A further discussion on wildlife habitat impacts is included in the *Wildlife Technical Report*.

The Alternative 3 alignment impact to emergent wetland 5980-1 (Figure 33) has the potential to impact terrestrial wildlife movement between the wetland areas and adjacent uplands. A further discussion of potential wildlife corridor impacts is included in the *Wildlife Technical Report*.

Fish habitat emergent wetland 5981-1 is also rated as having a high value for fish habitat (Table B-2). Impacts to fish resources at this site are discussed in detail in the *EFH Assessment*.

4.6 Alternatives 4A through 4D – Marine Options

In the following sections, the impacts of Alternatives 4A and 4C are discussed together since both of these alternatives primarily include changes to the ferry service and would not require any new highway or ferry terminal construction. Similarly, Alternatives 4B and 4D are discussed together since they both include extending the Glacier Highway from Echo Cove to Sawmill Cove and building a new ferry terminal at Sawmill Cove.

4.6.1 Alternatives 4A and 4C – Marine Alternatives – Auke Bay

These two alternatives change the way ferry service is provided in Lynn Canal. Under these alternatives, no new highways or ferry terminals are proposed; therefore, there would be no additional impacts on wetlands. There would be a relatively small amount (0.7 acres) of marine fill for terminal reconstruction at Auke Bay to accommodate a stern load berthing facility.

4.6.2 Alternatives 4B and 4D – Marine Alternatives – Berners Bay

These alternatives would change the type of ferry service in Lynn Canal and differ only in the type and frequency of ferry service provided.

4.6.2.1 Footprint Acreage

Both alternatives would construct a highway from Echo Cove to Sawmill Cove and a ferry terminal at Sawmill Cove. Construction would require the filling of approximately 10.3 acres of forested wetlands, 0.7 acres of scrub shrub/forested wetlands, and 0.01 acres of palustrine emergent wetlands along this highway, and another 1.9 acres of marine fill at the Sawmill Cove Ferry Terminal site. Dredging at this site would also affect approximately 1.3 acres of subtidal habitat. In addition, there would be 0.7 acres of subtidal fill for terminal modification at Auke Bay to accommodate a stern berth.

4.6.2.2 Impacts to Wetland Functions and Values

The loss of forested wetlands from fill for the highway would modify the groundwater recharge functions, the groundwater discharge/lateral flow functions, and the surface hydrologic control functions of these wetlands. The remaining portions of these forested wetlands, and the wetlands in unaffected areas outside the highway corridor, would continue to provide these functions. Proper ditches and drainage structures under the highway would minimize effects on the hydrologic functions of these wetlands.

Sawmill Cove has high wildlife and fish habitat values. This area is rated as high because existing survey data indicate that the area is frequently used by waterfowl and shorebirds and/or a high number of great blue heron, Vancouver Canada geese, mallard, or bald eagle relative to other similar wetlands in the area. A further discussion on wildlife impacts is included in the *Wildlife Technical Report*.

The placement of fill on intertidal habitat at Sawmill Cove will modify fish habitat. Sawmill Cove contains herring spawning habitat. The impacts to fish habitat is discussed in the *Anadromous and Resident Fish Streams Technical Report* and the *EFH Assessment*.

Table 4-1
East Lynn Canal – Alternatives 2, 2A, 2B and 2C
Total Fill Areas (Acres) by Wetland Type and Sub-Region, December 2003 Alignment

Sub-Region	Classification	Area of Fill			
		Alternative 2	Alternative 2A	Alternative 2B	Alternative 2C
East Sub-Region 1	Wetlands				
	Palustrine Emergent	3.4	0.01	3.4	3.4
	Palustrine Forested	19.1	10.3	19.1	19.1
	Palustrine Scrub-Shrub	0.7	0.7	0.7	0.7
	Sub Total	23.2	11.0	23.2	23.2
	Marine Areas				
	Rocky Shores	0.0	1.9	0.0	0.0
	Sub Total	0.0	1.9	0.0	0.0
East Sub-Region 2	Wetlands				
	Palustrine Emergent	3.2	3.2	3.2	3.2
	Palustrine Forested	59.2	50.2	59.2	59.2
	Sub Total	62.4	53.4	62.4	62.4
	Marine Areas				
	Beach Bars	0.0	1.1	0.0	0.0
	Sub Total	0.0	1.1	0.0	0.0
East Sub-Region 3	Wetlands				
	Estuarine Emergent	0.8	0.8	0.8	0.8
	Palustrine Forested	1.3	1.3	1.3	1.3
	Sub Total	2.1	2.1	2.1	2.1
	Marine Areas				
	Rocky Shores	19.2	19.2	19.2	19.2
	Sub Total	19.2	19.2	19.2	19.2
East Sub-Region 4	Wetlands				
	Estuarine Emergent	4.7	4.7	4.7	2.2
	Sub Total	4.7	4.7	4.7	2.2
	Marine Areas				
	Beach Bar	1.3	1.3	1.3	1.3
	Rocky Shores	5.7	5.7	5.7	1.4
	Sub Total	7.0	7.0	7.0	2.7

Table 4-1 (continued)
East Lynn Canal – Alternatives 2, 2A, 2B and 2C
Total Fill Areas (Acres) by Wetland Type and Sub-Region, December 2003 Alignment

Sub-Region	Classification	Area of Fill			
		Alternative 2	Alternative 2A	Alternative 2B	Alternative 2C
All East Lynn Canal Sub-Regions	Wetlands				
	Palustrine Emergent	6.6	3.2	6.6	6.6
	Palustrine Forested	79.6	61.8	79.6	79.6
	Palustrine Scrub-Shrub	0.7	0.7	0.7	0.7
	Estuarine Emergent	5.5	5.5	5.5	3.0
	Sub Total	92.4	71.2	92.4	89.9
	Marine Areas				
	Beach Bars	1.3	2.4	1.3	1.3
	Rocky Shores	24.9	26.8	24.9	20.6
	Sub Total	26.2	29.2	26.2	21.9
	Sub-Regions Totals				
	Total Wetlands	92.4	71.2	92.4	89.9
	Total Marine Areas	26.2	29.2	26.2	21.9
	Total Acres	118.6	100.4	118.6	111.8

Note: Acreages do not include riverine areas intersected by the proposed alignments.

Table 4-2
West Lynn Canal – Alternative 3
Total Fill Areas (Acres) by Wetland Type and Sub-Region

Sub-Region	Classification	Area of Fill (Acres)
West Sub-Region 1	Wetlands	
	Palustrine Emergent	1.9
	Palustrine Forested	18.7
	Estuarine Emergent	0.4
	Sub Total	21.0
	Marine Areas	
	Beach Bars	0.09
	Rocky Shores	4.8
	Sub Total	4.9
West Sub-Region 2	Wetlands	
	Palustrine Emergent	0.4
	Palustrine Forested	1.1
	Sub Total	1.5
	Fresh Water Aquatic Areas	
	Palustrine Aquatic Beds	0.2
	Sub Total	0.2
West Sub-Region 3	Wetlands	
	Palustrine Forested	0.9
	Estuarine Emergent	1.1
	Sub Total	2.0
	Marine Areas	
	Beach Bars	4.8
	Sub Total	4.8
East Sub-Region 1 (Alternatives 4B & 4D)	Wetlands	
	Palustrine Emergent	0.01
	Palustrine Forested	10.3
	Palustrine Scrub-Shrub	0.7
	Sub Total	11.0
	Marine Areas	
	Rocky Shores	1.9
	Sub Total	1.9
All West Lynn Canal Sub-Regions (plus East Sub-Region 1)	Wetlands	
	Palustrine Emergent	2.3
	Palustrine Forested	31.0
	Palustrine Scrub-Shrub	0.7
	Estuarine Emergent	1.5
	Sub Total	35.5
	Fresh Water Aquatic Areas	
	Palustrine Aquatic Beds	0.2
	Sub Total	0.2
	Marine Areas	
	Beach Bars	4.9
	Rocky Shores	6.7
	Sub Total	11.6
All West Lynn Canal Sub-Regions (plus East Sub-Region 1)	Sub-Regions Total	
	Total Wetlands	35.5
	Total Fresh Water Aquatic Areas	0.2
	Total Marine Areas	11.6
	Total Acres	47.3

Note: Acreages do not include riverine areas intersected by the proposed alignments.

Table 4-3
Total Area Wetlands (Acres) and other Waters of the U.S.
Affected by Project Alternatives December 2003 Alignment

Wetlands and Other Waters of the U.S	Alternative 2 (Preferred)	Alternative 2A	Alternative 2B	Alternative 2C	Alternative 3	Alternatives 4B and 4D
	East Lynn Canal Highway with Katzeihin Ferry Terminal	East Lynn Canal Highway with Berners Bay Shuttles	East Lynn Canal Highway to Katzeihin with Shuttles to Haines and Skagway	East Lynn Canal Highway with Haines/Skagway Shuttle	West Lynn Canal Highway and Glacier Highway to Sawmill Cove	Glacier Highway to Sawmill Cove
Wetlands						
Palustrine Emergent	6.6	3.2	6.6	6.6	2.3	0.01
Palustrine Forested	79.7	61.7	79.7	79.7	31.0	10.3
Palustrine Scrub-shrub	0.7	0.7	0.7	0.7	0.7	0.7
Estuarine Emergent	5.5	5.5	5.5	3.0	1.5	0.0
Sub Total	92.5	71.2	92.5	90.0	35.5	11.0
Fresh Water Aquatic Areas						
Aquatic Beds	0.0	0.0	0.0	0.0	0.2	0.0
Sub Total	0.0	0.0	0.0	0.0	0.2	0.0
Marine Areas						
Beach Bar	1.3	2.4	1.3	1.3	4.9	0.0
Rocky Shore Beaches	24.9	26.8	24.9	20.6	6.7	1.9
Sub Total	26.2	29.2	26.2	21.9	11.6	1.9
Total Acres	118.7	100.4	118.7	111.9	47.3	12.9

Note: Acreages do not include riverine areas intersected by the proposed alignments.

Table 4-4
Impacts to Functions and Values for Individual Wetlands and Estuarine Sites,
East Lynn Canal Alignment, December 2003

Habitat Type	Cowardin Class	Wetland Type	Wetland ID	Total Area	Fill Area	Impacts to Functions and Values Description (Fill for highway construction unless otherwise noted)
				Acres		
Sub-Region 1 – Echo Cove to Slate Cove						
Wetlands	PFO4B	Forested	115-1	2.70	0.76	This small wetland appears to be fed by groundwater Modification of groundwater recharge, groundwater discharge/lateral flow and surface hydrologic control.
	PFO4B	Forested	135-1	2.44	0.34	This small wetland appears to be fed by groundwater. Modification of groundwater recharge, groundwater discharge/lateral flow and surface hydrologic control.
	PFO4B	Forested	150-1	22.58	1.41	This forested wetland appears to be fed by a groundwater source. Modification of groundwater recharge, groundwater discharge/lateral flow and surface hydrologic control.
	PFO4B	Forested	165-1	44.46	5.66	This wetland appears to be fed by groundwater from hillside. Modification of groundwater recharge, groundwater discharge/lateral flow and surface hydrologic control.
	PFO4B	Forested	190-1	2.24	0.40	This small wetland appears to be fed by groundwater seep. Modification of groundwater recharge, groundwater discharge/lateral flow and surface hydrologic control.
	PFO4B	Forested	195-1	1.88	0.31	Modification of groundwater recharge, groundwater discharge/lateral flow and surface hydrologic control.
	PFO4B	Forested	200-1	1.28	0.22	Modification of groundwater recharge, groundwater discharge/lateral flow and surface hydrologic control.
	PFO4B	Forested	235-1	3.20	0.98	This small wetland appears to be fed by groundwater seep. Modification of groundwater recharge, groundwater discharge/lateral flow and surface hydrologic control.
	PFO4B	Forested	265-1	6.11	0.21	This small wetland appears to be fed by groundwater seep. Modification of groundwater discharge/lateral flow functions.
	PSS1B/PFO4B	Scrub-Shrub/Forested	340-1	4.51	0.73	Modification of groundwater recharge, groundwater discharge/lateral flow and surface hydrologic control.
	PFO4B	Forested	415-1	67.91	2.12	Modification of groundwater recharge, groundwater discharge/lateral flow and surface hydrologic control.

Table 4-4 (continued)
Impacts to Functions and Values for Individual Wetlands and Estuarine Sites,
East Lynn Canal Alignment, December 2003

Habitat Type	Cowardin Class	Wetland Type	Wetland ID	Total Area	Fill Area	Impacts to Functions and Values Description (Fill for highway construction unless otherwise noted)
				Acres		
Sub-Region 1 – Echo Cove to Slate Cove (continued)						
Wetlands (continued)	PFO1A/PSS1A	Forested/Emergent	735-4	57.01	4.15	Modification of groundwater recharge, groundwater discharge/lateral flow functions and riparian support.
	PFO1A	Forested	680-2	80.99	2.59	Modification of groundwater recharge/discharge functions and riparian support.
	PEM1S	Emergent	735-2	31.19	0.10	Except for modification wildlife habitat, functions not substantially impacted due to small fill area.
	PEM1B/PSS4B	Emergent/Scrub-Shrub	420-1	13.38	0.72	Modification of groundwater recharge/discharge functions and wildlife habitat.
	PEM1B/PSS4B	Emergent/Scrub-Shrub	440-1	6.63	2.06	Modification of groundwater recharge/discharge functions and wildlife habitat.
	PEM1B	Emergent	270-1	0.62	0.01	Functions not substantially impacted due to small fill area.
	PEM1B	Emergent	800-4	1.13	0.49	Modification of groundwater recharge, surface hydrologic control, and sediment retention.
Marine Areas	E2RS2N	Rocky Shore	370-T	NA	See Notes	Terminal construction at Sawmill Cove would modify fish habitat and wildlife habitat functions at this location.
Sub-Region 2 - Slate Cove to Sherman Point						
Wetlands	PFO4B	Forested	895-1	88.06	6.19	Modification groundwater recharge/discharge functions and riparian support.
	PFO4B	Forested	910-2	6.44	0.43	Modification of groundwater recharge/discharge functions, riparian support, and wildlife habitat.
	PEM1B/PSS4B	Emergent/Scrub-Shrub	920-1	0.58	0.10	Modification of groundwater recharge/discharge functions, nutrient transport, riparian support, and wildlife habitat.
	PFO4B	Forested	955-2	1103.85	See Notes	Modification of surface hydrologic control and groundwater recharge functions. Some loss of wildlife habitat functions.
	PEM1B/PSS4B	Emergent/Scrub-Shrub	1010-1	1.13	0.30	Modification groundwater recharge/discharge functions and wildlife habitat.
	PFO4B/PEM1B	Forested/Emergent	1015-1	2.80	0.36	Modification groundwater recharge/discharge functions.
	PFO4B/PEM1B	Forested/Emergent	1020-1	6.04	0.16	Functions not substantially impacted due to small fill area.
	PEM1B/PSS4B	Emergent/Scrub-Shrub	1040-1	16.55	1.82	Modification of groundwater recharge/discharge functions and wildlife habitat.
	PFO4B/PEM1B	Forested/Emergent	1070-1	8.45	1.09	Modification of groundwater recharge/discharge functions and wildlife habitat.
	PEM1B/PSS4B	Emergent/Scrub-Shrub	1110-1	2.30	0.14	Functions not substantially impacted due to small fill area.

Table 4-4 (continued)
Impacts to Functions and Values for Individual Wetlands and Estuarine Sites,
East Lynn Canal Alignment, December 2003

Habitat Type	Cowardin Class	Wetland Type	Wetland ID	Total Area	Fill Area	Impacts to Functions and Values Description (Fill for highway construction unless otherwise noted)
				Acres		
Wetlands (continued)	PEM1B/PSS4B	Emergent/Scrub-Shrub	1135-1	1.02	0.24	Modification of groundwater discharge/recharge functions.
	PEM1B/PSS4B	Emergent/Scrub-Shrub	1150-1	4.63	0.61	Modification of groundwater recharge/discharge functions and wildlife habitat.
	PFO4B/PSS1B	Forested/Scrub-Shrub	1185-1	205.49	11.38	Modification of groundwater recharge/discharge functions, nutrient transport, riparian support, and wildlife habitat.
	PFO4B/PSS1B	Forested/Scrub-shrub	1220-1	27.40	1.79	Modification of groundwater recharge/discharge functions and wildlife habitat.
	PFO4B	Forested	1260-1	30.07	1.70	Modification of groundwater discharge/recharge functions.
	PFO4B	Forested	1275-1	23.41	2.38	Modification of groundwater discharge/recharge functions.
Marine Areas	E2BB1N	Beach Bar	900-T	NA	See Notes	Fill for terminal site at Slate Cove would modify fish and wildlife habitat.
Sub-Region 3 - Sherman Point to Katzehin River						
Wetlands	PFO4B	Forested	1360-1	33.74	1.12	Modification of groundwater discharge/recharge functions.
	PFO4B	Forested	1375-1	58.76	0.17	Functions not substantially impacted due to small fill area.
	E2EM1N	Estuarine Emergent	2590-1	NA	0.79	Functions not substantially impacted due to small fill area.
Marine Areas	E2RS2N/ E2US1N	Rocky Shore/ Unconsolidated Shore	1380-1	NA	0.57	Modification of fish habitat.
	E2RS2N	Rocky Shore	1480-1	NA	18.67	Modification of fish habitat.

Table 4-4 (continued)
Impacts to Functions and Values for Individual Wetlands and Estuarine Sites,
East Lynn Canal Alignment, December 2003

Habitat Type	Cowardin Class	Wetland Type	Wetland ID	Total Area	Fill Area	Impacts to Functions and Values Description (Fill for highway construction unless otherwise noted)
Sub-Region 4 - Katzeihin River to Skagway						
Wetlands	E2EM1N	Estuarine Emergent	2630-1	NA	0.21	Functions not substantially impacted due to small fill area.
	E2EM1P	Estuarine Emergent	2690-1	NA	0.44	Functions not substantially impacted due to small fill area.
	E2EM1N	Estuarine Emergent	2735-1	NA	0.91	Functions not substantially impacted due to small fill area.
	E2EM1N	Estuarine Emergent	2750-1	NA	See Notes	Modification of groundwater recharge/discharge functions, riparian support, and fish and wildlife habitat.
Marine Areas	E2BB1P	Beach Bar	2735-2	1.87	1.33	Modification of wildlife habitat.
	E2RS2N	Rocky Shore	2745-T	NA	See Notes	Modification of fish/wildlife habitat.
	E2RS2N	Rocky Shore	2765-1	NA	See Notes	Modification of fish/wildlife habitat.
	E2RS2N	Rocky Shore	2800-1	NA	0.01	Functions not substantially impacted due to small fill area.
	E2RS2N	Rocky Shore	3000-1	NA	0.19	Modification of fish habitat.
	E2RS2N	Rocky Shore	3300-1	NA	0.35	Modification of fish habitat.

Notes: ¹The total acreage of a given marine intertidal area is a function of the beach slope and beach length. Because of the continuous nature of these marine types (i.e., rocky shores, beach bars, and unconsolidated shores), and the variability of seaward slope distances, delineation of these marine intertidal boundaries was only conducted in the vicinity of potential impacts.

²Sawmill Cove Ferry Terminal (370-T; E2RS2N): Impacted acreage by Alternatives 2A, 3, 4B and 4D = 1.9 acres; By Alternatives 2, 2B, and 2C = 0.0 acres.

³Slate Cove Ferry Terminal (900-T; E2BB1N): Impacted acreage by Alternative 2A = 2.1 acres; By Alternatives 2, 2B, 2C, 3, 4B, and 4D = 0.0 acres.

⁴Slate Cove Ferry Access Road (955-2; PFO4B): Impacted acreage by Alternative 2A = 1.9 acres - total impacts to forested wetland (955-2) by Alternative 2A (with access road) = 31.3 acres; Impacted acreage by Alternatives 2, 2B and 2C = 33.8 acres.

⁵Katzeihin Ferry Terminal: Impacted acreage by Alternatives 2, 2A, and 2B = 2.2 acres (2765-1; E2RS2N); 2.9 acres (2745-T); and 3.2 acres (2750-1; E2EM1N); Impacted acreage by Alternative 2C (no ferry terminal, impacts from access road only) = 0.3 acres (2765-1; E2RS2N), 0.6 acres (2750-1; E2RS2N), and 0.6 acres (2750-1; E2EM1N).

NA = total area not available

Table 4-5
Impacts to Functions and Values for Individual Wetlands and Estuarine Sites,
West Lynn Canal Alignment, December 2003

Habitat Type	Cowardin Class	Wetland Type	Wetland ID	Total Area	Fill Area	Impacts to Functions and Values Description (Fill for highway construction unless otherwise indicated)
				Acres		
Sub-Region 1 - William Henry Bay to Davidson Glacier Outwash Plain						
Wetlands	PFO4B	Forested	4880-1	198.25	5.33	This large forested wetland has relatively high surface water flow. Modification of groundwater recharge/discharge functions, nutrient transport, and wildlife habitat.
	PFO4B	Forested	4040-2	21.86	1.49	Modification of groundwater recharge/discharge functions.
	PFO4B	Forested	4410-1	42.35	2.88	Modification of groundwater recharge/discharge functions.
	PFO4B	Forested	4940-1	62.16	3.97	Modification of groundwater recharge/discharge functions.
	PFO4B	Forested	4940-2	51.11	5.04	Modification of groundwater recharge/discharge functions and riparian support.
	PEM1B	Emergent	4135-1	4.27	1.85	Modification of groundwater recharge/discharge functions, surface hydrologic control, and sediment retention.
	E2EM1P	Estuarine Emergent	4620-1	0.8	0.21	Modification of groundwater recharge/discharge functions, riparian support and wildlife habitat.
	E2EM1P	Estuarine Emergent	4900-1	17.28	0.17	Functions not substantially impacted due to small fill area.
Marine Areas	E2RS2N	Rocky Shore	4030-T	NA	4.60	Modification of fish and wildlife habitat.
	E2BB1N	Beach Bar	4570-3	NA	0.09	Modification of wildlife habitat.
Sub-Region 2 - Davidson Glacier Outwash Plain						
Wetlands	PFO5Fb	Forested (Dead Tree)	5645-1	10.12	1.12	Modification of groundwater recharge/discharge functions, sediment transport, and wildlife habitat.
	PEM1B	Emergent	5560-1	0.74	0.05	Functions not substantially impacted due to small fill area.
	PEM1B	Emergent	5570-2	2.25	0.35	Modification of groundwater discharge functions.

Table 4-5 (continued)
Impacts to Functions and Values for Individual Wetlands and Estuarine Sites,
West Lynn Canal Alignment, December 2003

Habitat Type	Cowardin Class	Wetland Type	Wetland ID	Total Area	Fill Area	Impacts to Functions and Values Description (Fill for highway construction unless otherwise indicated)
				Acres		
Sub-Region 2 - Davidson Glacier Outwash Plain (continued)						
Aquatic Beds/ Open Water	PAB4H	Aquatic Bed	5580-2	0.56	0.17	Modification of groundwater discharge function and wildlife habitat.
Sub-Region 3 - Davidson Glacier Outwash Plain to Haines						
Wetlands	PFO4B	Forested	5670-1	8.05	0.93	Modification of groundwater recharge/discharge functions.
	E2EM1N	Estuarine Emergent	5980-1	NA	1.11	Modify riparian support and fish/wildlife habitat.
Marine Areas	E2BB1N	Beach Bar	6040-1	NA	4.80	Modify wildlife habitat.

Notes: ¹The total acreage of a given marine intertidal area is a function of the beach slope and beach length. Because of the continuous nature of these marine types (i.e., rocky shores, beach bars, and unconsolidated shores), and the variability of seaward slope distances, delineation of these marine intertidal boundaries was only conducted in the vicinity of potential impacts.

²William Henry Bay Ferry Terminal (4030-T; E2RS2N): Impacted acreage by Alternative 3 = 4.6 acres; By Alternatives 2, 2A, 2B, 2C, 4B & 4D = 0.0 acres.

NA = total area not available

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5.0 LIST OF PREPARERS

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Timothy King	GIS Specialist URS Corporation Developed wetland field maps and technical report maps
Sue Ban	Senior Biologist URS Corporation Senior review of document

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FIGURES

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NWI (COWARDIN CLASSIFICATION) CODE LIST

Wetlands

Palustrine Scrub-Shrub Wetlands

- PSS1A = Palustrine broad-leaved deciduous scrub-shrub wetland, temporarily flooded
- PSS1B = Palustrine broad-leaved deciduous scrub-shrub wetland with saturated soils
- PSS1C = Palustrine broad-leaved deciduous scrub-shrub wetland, seasonally flooded
- PSS4B = Palustrine needle-leaved evergreen scrub-shrub wetland with saturated soils

Palustrine Emergent Wetlands

- PEM1B = Palustrine persistent emergent vegetation with saturated soils
- PEM5B = Palustrine narrow-leaved persistent vegetation with saturated soils
- PEM1C = Palustrine persistent emergent vegetation, seasonally flooded
- PEM5C = Palustrine narrow-leaved persistent vegetation, seasonally flooded
- PEM1S = Palustrine persistent emergent vegetation, temporarily tidal

Palustrine Forested Wetlands

- PFO1A = Palustrine broad-leaved deciduous forested, temporarily flooded
- PFO4B = Palustrine needle-leaved evergreen forested, saturated soils
- PFO5Fb = Palustrine dead forest, semi-permanently flooded, evidence of beaver activity

Estuarine Emergent Wetlands

- E2EM1N = Estuarine intertidal persistent emergent vegetation, regularly flooded
- E2EM1P = Estuarine intertidal persistent emergent vegetation, irregularly flooded

Freshwater Aquatic Areas

Palustrine Aquatic Beds

- PAB4H = Palustrine aquatic bed with floating-leaved vascular vegetation, permanently flooded

Palustrine Open Waters

- POWH = Palustrine open water, unknown bottom, permanently flooded

Marine Areas

Estuarine Rocky Shores

- E2RS2N = Estuarine intertidal rocky shores with rubble substrate, regularly flooded

Estuarine Beach Bars

- E2BB1N = Estuarine intertidal beach bar with cobble-gravel substrate, regularly flooded
- E2BB1P = Estuarine intertidal beach bar with cobble-gravel substrate, irregularly flooded

Estuarine Miscellaneous

- E2FL1P = Estuarine intertidal flats with cobble-gravel substrate, irregularly flooded
- E2US1N = Estuarine unconsolidated shore with cobble-gravel substrate, regularly flooded

Other Waters of the U.S.

Estuarine Subtidal

- E1UBL = Estuarine subtidal, unconsolidated bottom

Tidal Riverine

- R1UBV = Tidal river, unconsolidated bottom, permanently tidal
- R1USN = Tidal river, unconsolidated shore, regularly flooded
- R1FLR = Tidal river flats, seasonally tidal

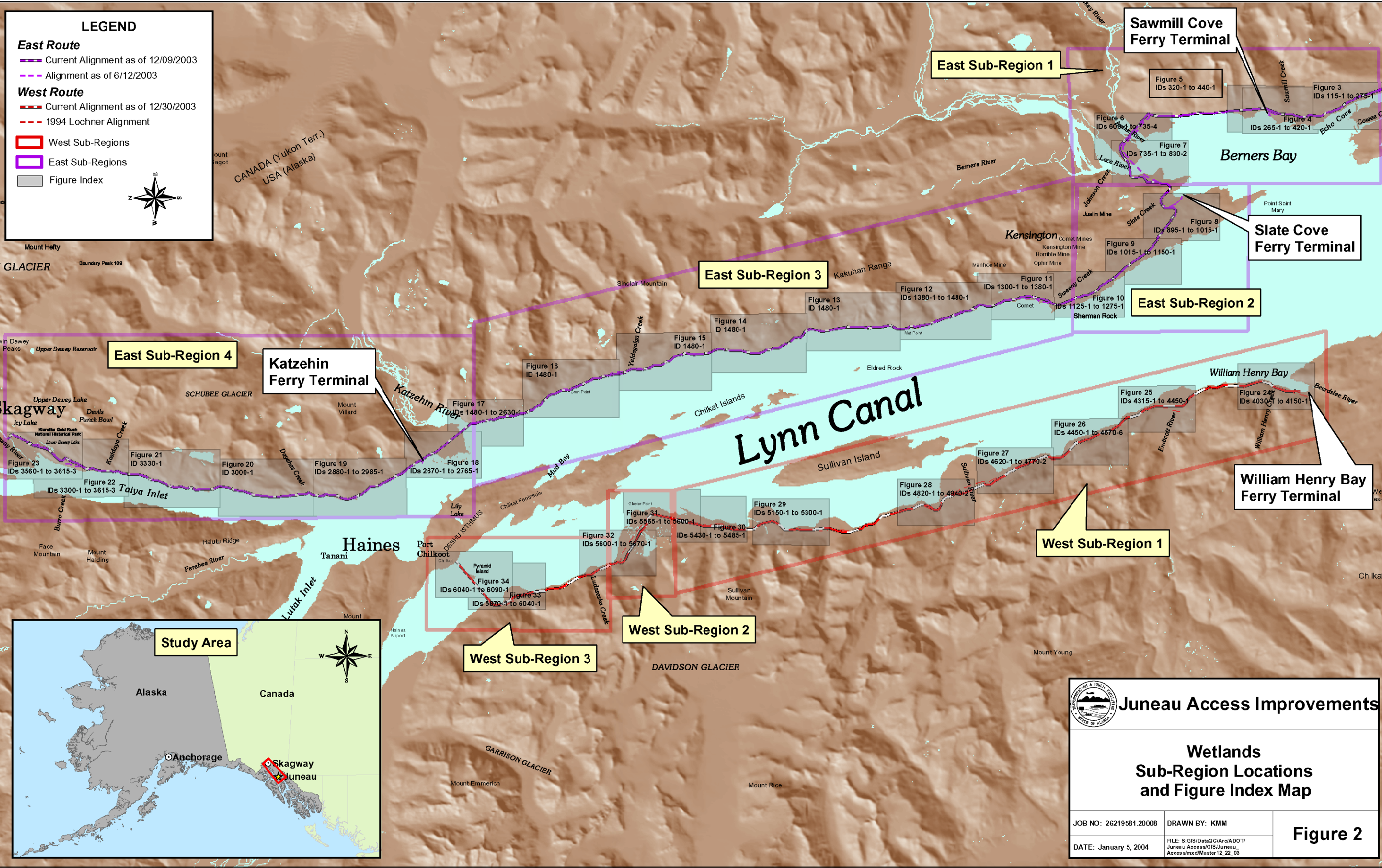
Lower Perennial Riverine

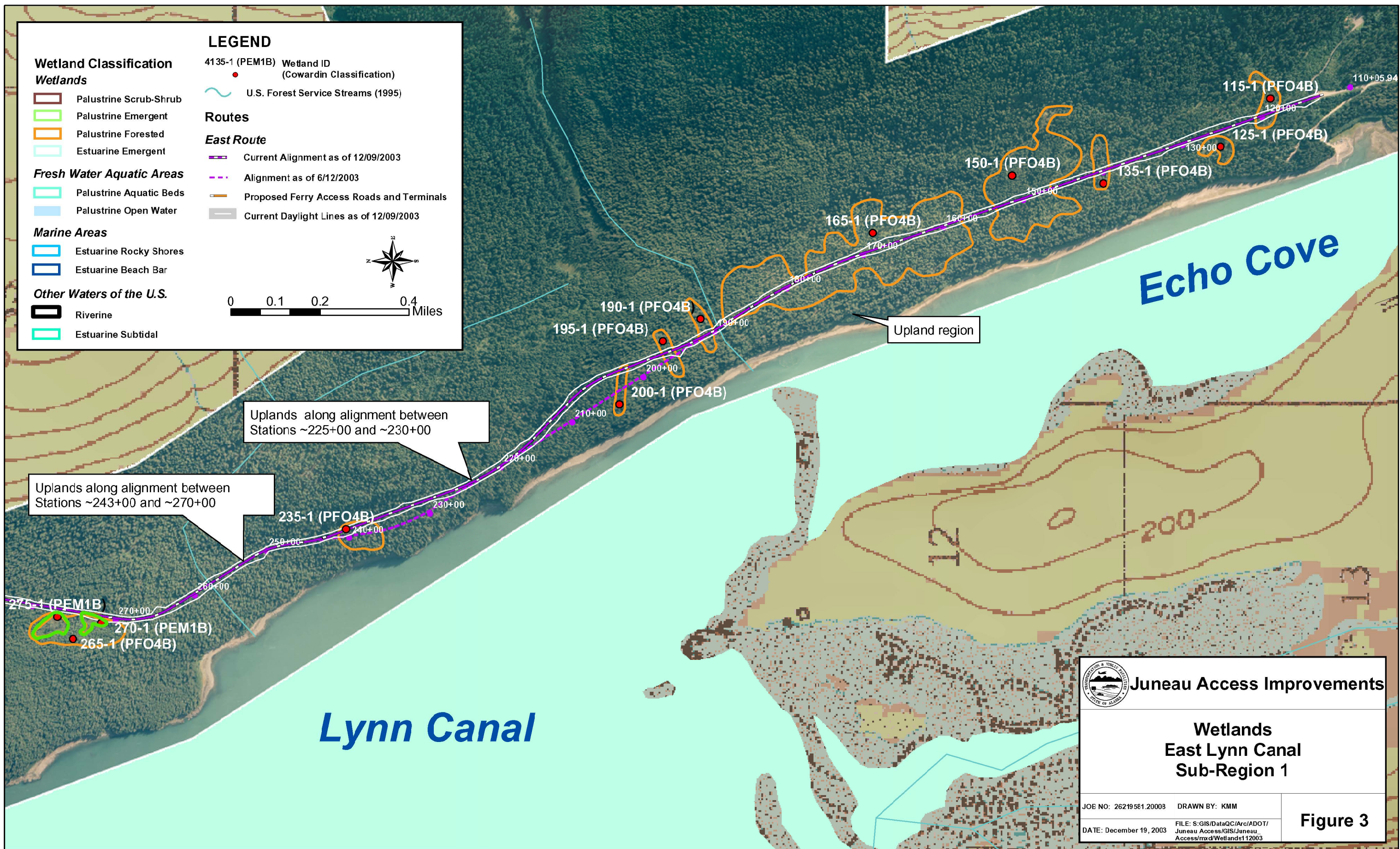
- R2USN = Lower perennial river, unconsolidated shore, regularly flooded
- R2UBH = Lower perennial river, unconsolidated bottom, permanently flooded
- R2OWH = Lower perennial river, open water with unknown bottom, permanently flooded

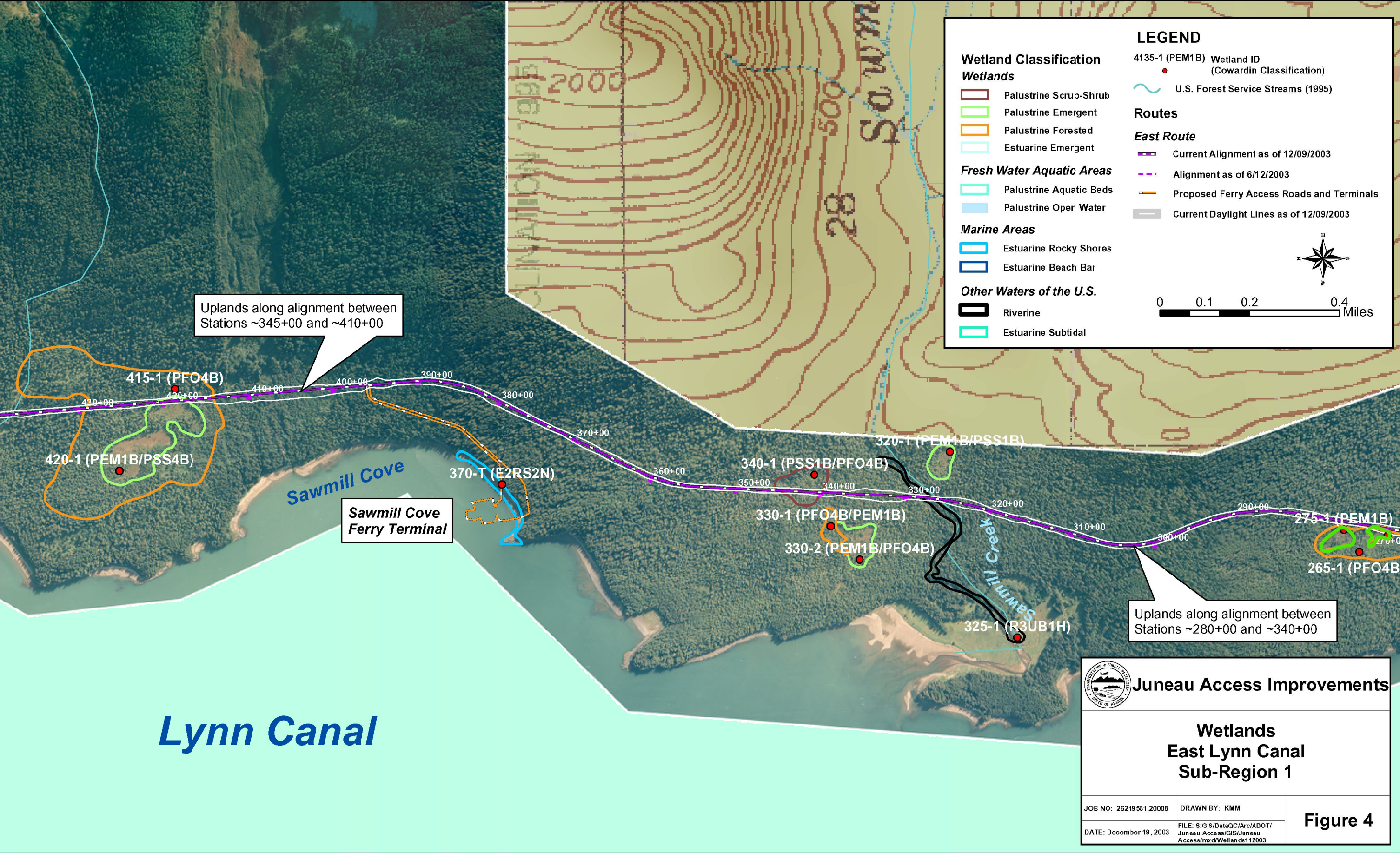
Upper Perennial Riverine


- R3UB1H = Upper perennial river, unconsolidated bottom, with cobble-gravel substrate permanently flooded
- R3US1 = Upper perennial river, unconsolidated shore with cobble-gravel substrate
- R3OWH = Upper perennial river, open water, unknown bottom, permanently flooded
- R3FLA = Upper perennial river flats, temporarily flooded

The wetlands depicted in the following figures are only delineated within the proposed project area corridor. Some wetlands, especially between Slate Cove and Sherman Point, have boundaries that extend beyond the aerial photography and have not been delineated to their actual boundaries. Rocky shore beaches, beach bars, and riverine polygons do not represent the true boundaries of those habitat types, but are delineated to represent the areas that may be impacted by the proposed alternatives.





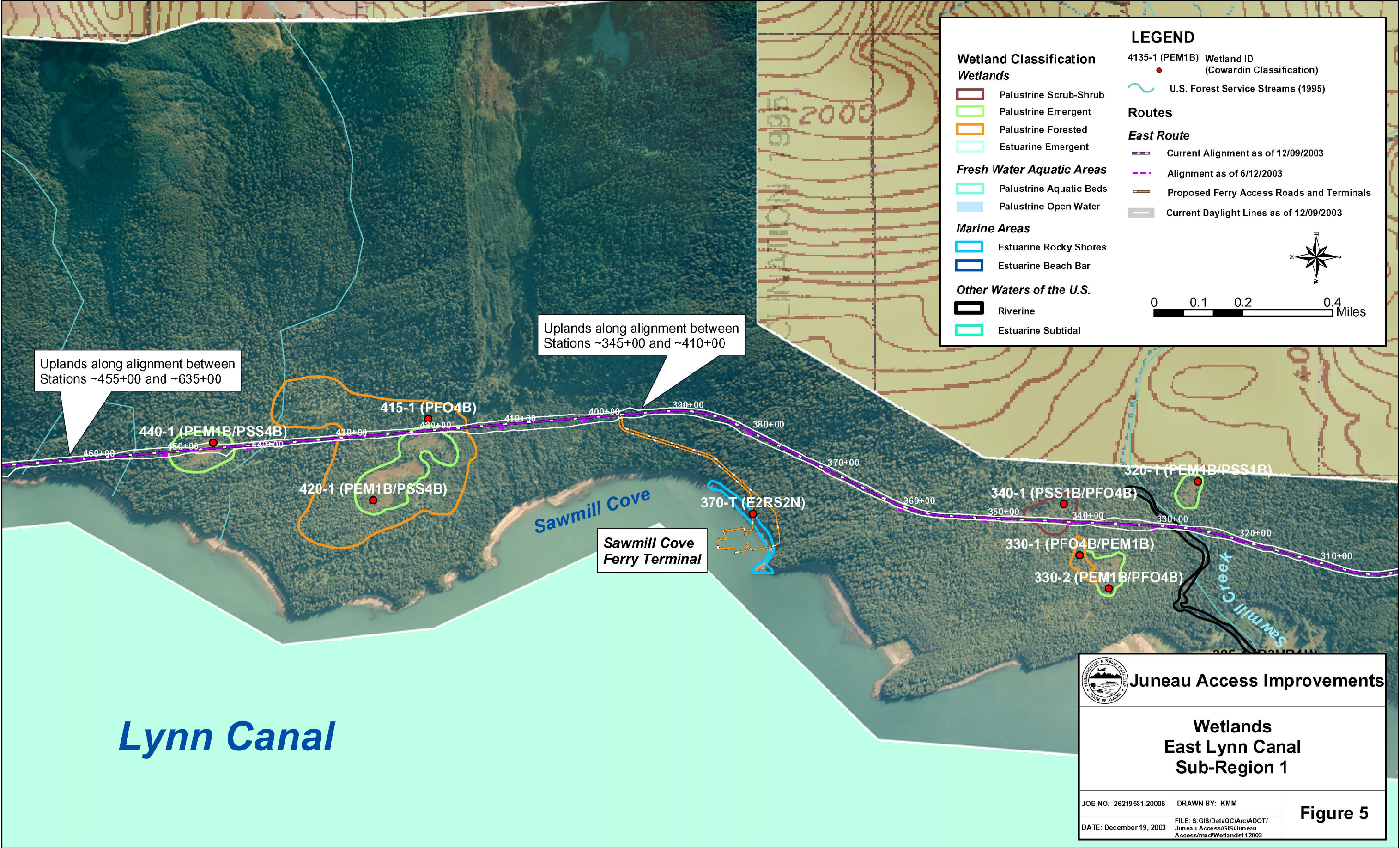


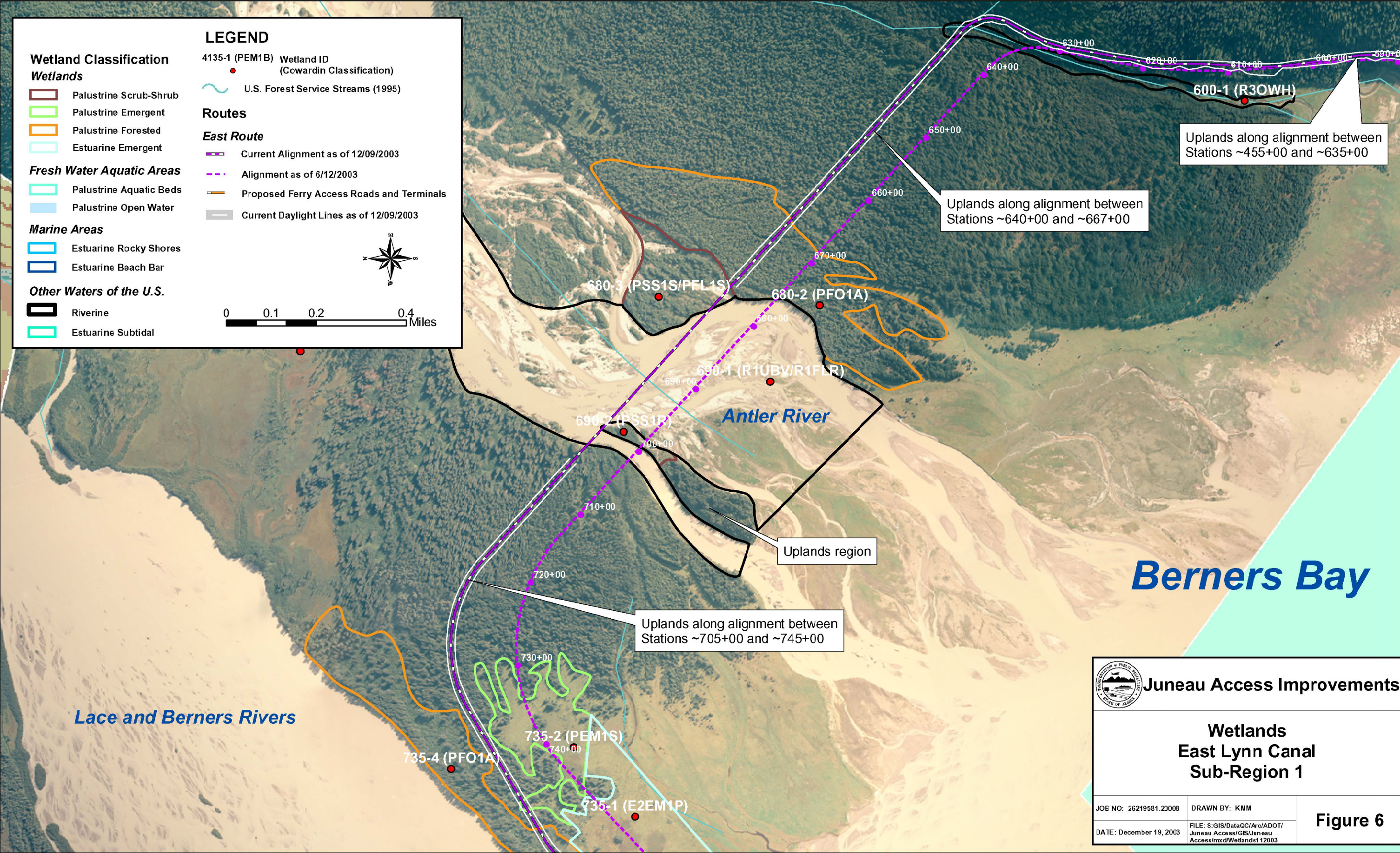

Juneau Access Improvements


**Wetlands
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Figure 4

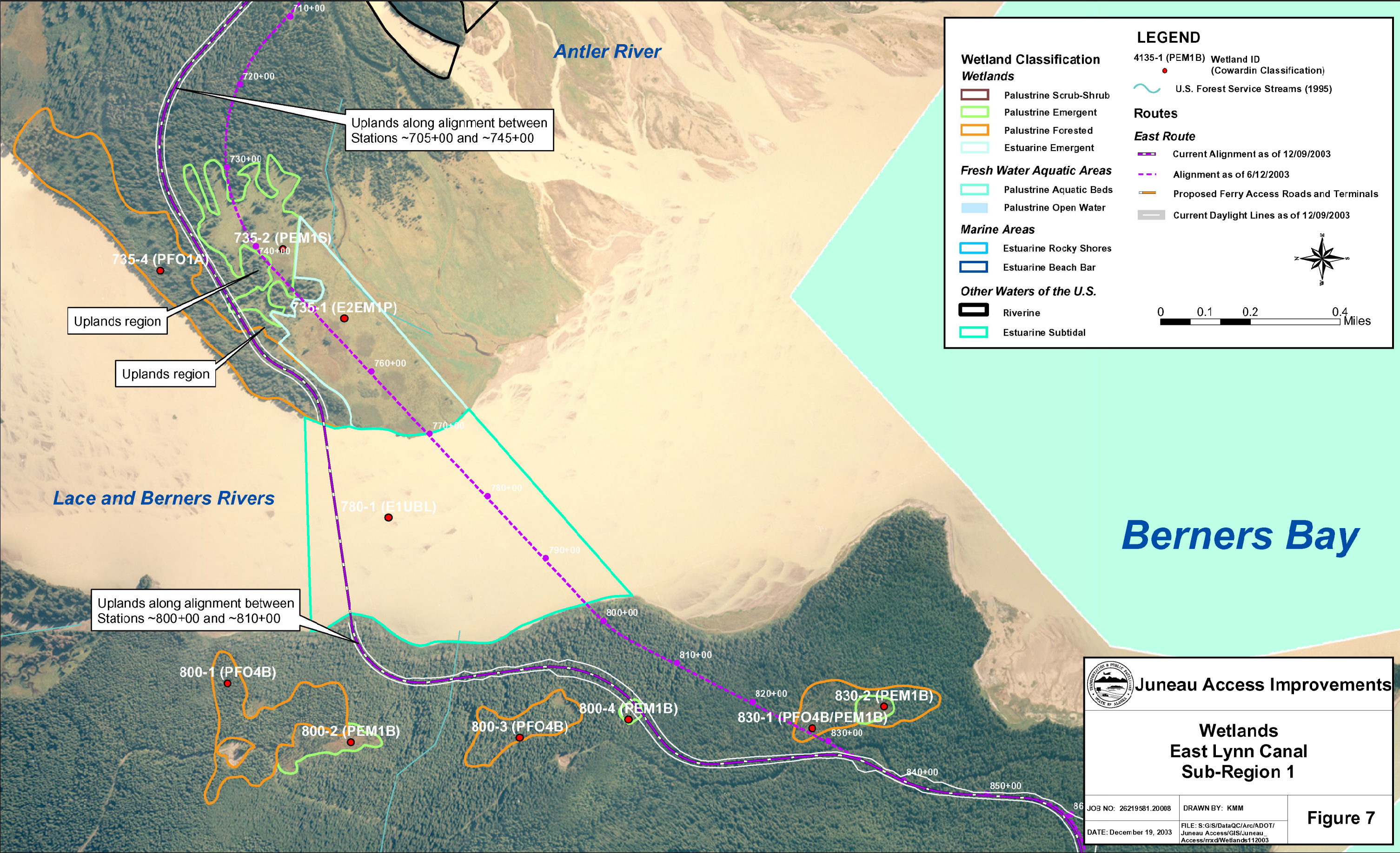


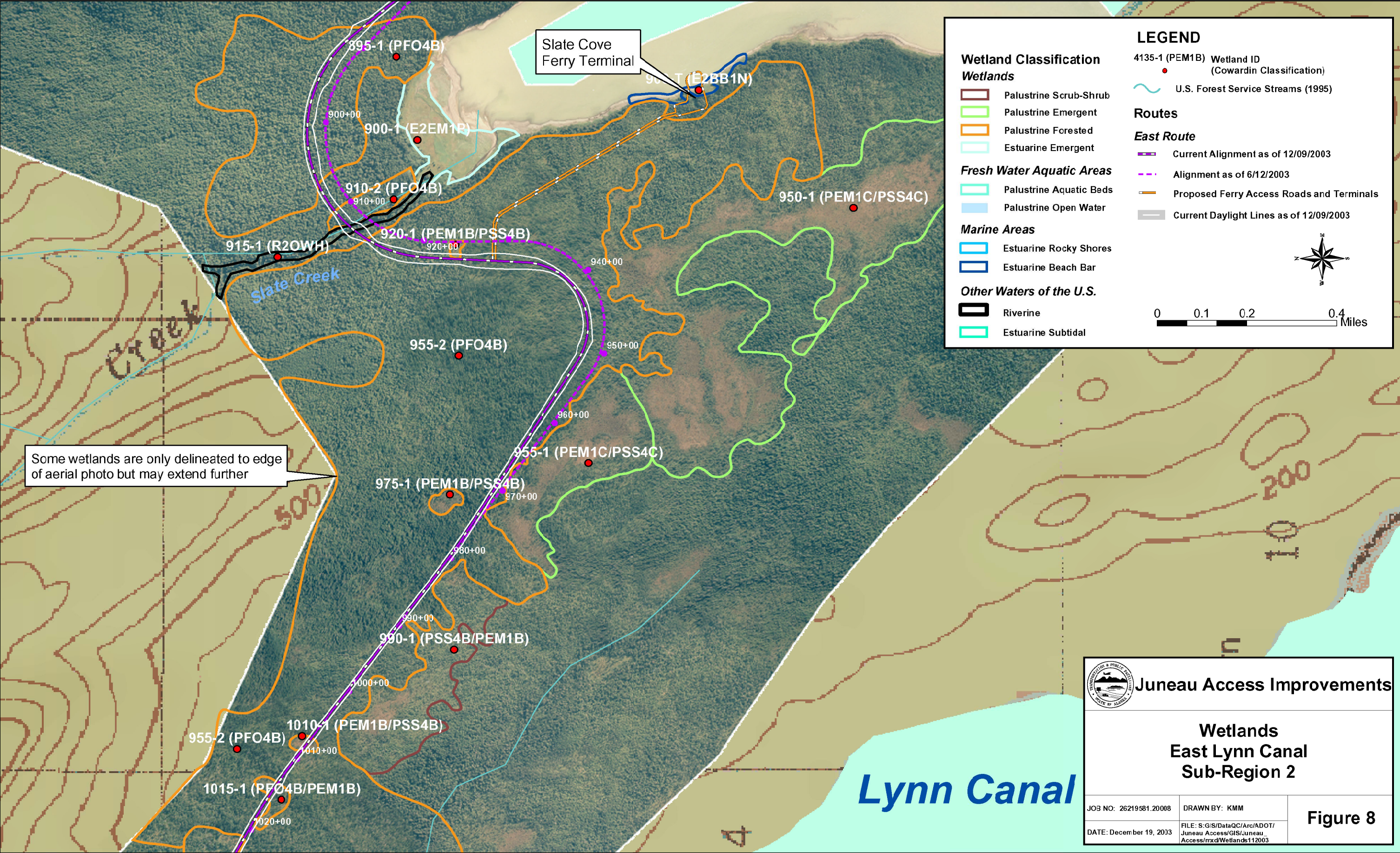


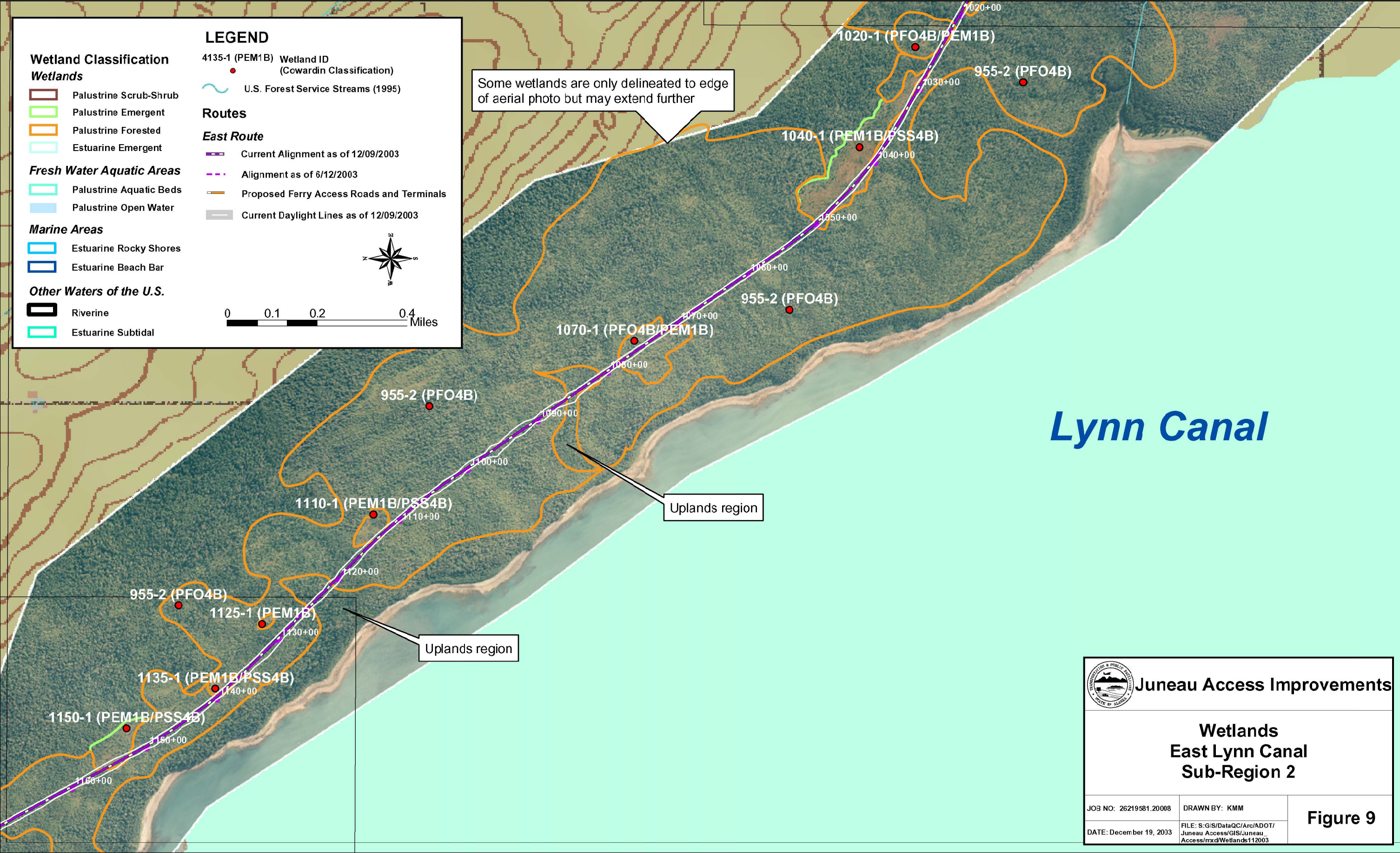
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Wetlands
East Lynn Canal
Sub-Region 1

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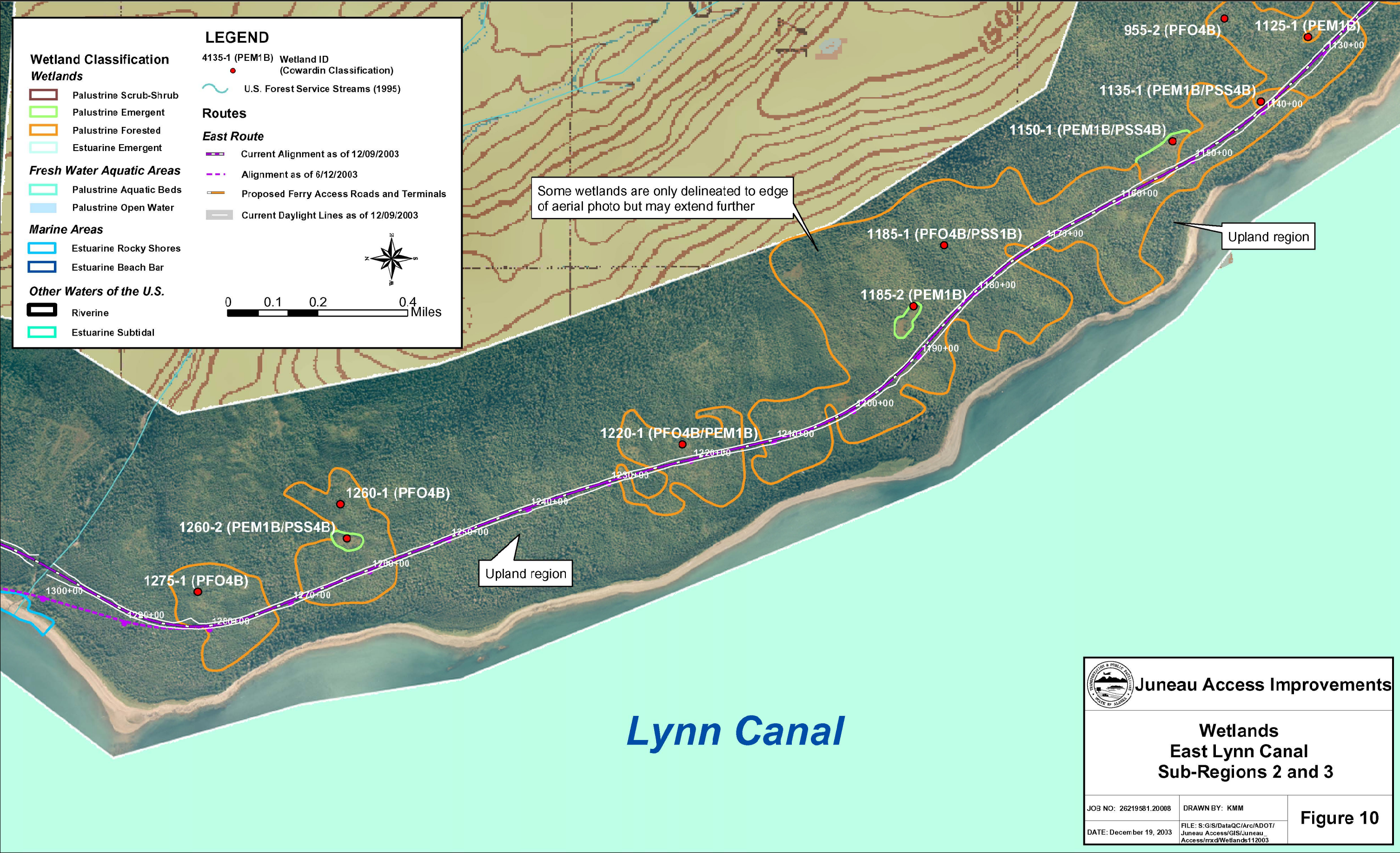
Juneau Access Improvements


Wetlands
East Lynn Canal
Sub-Region 2

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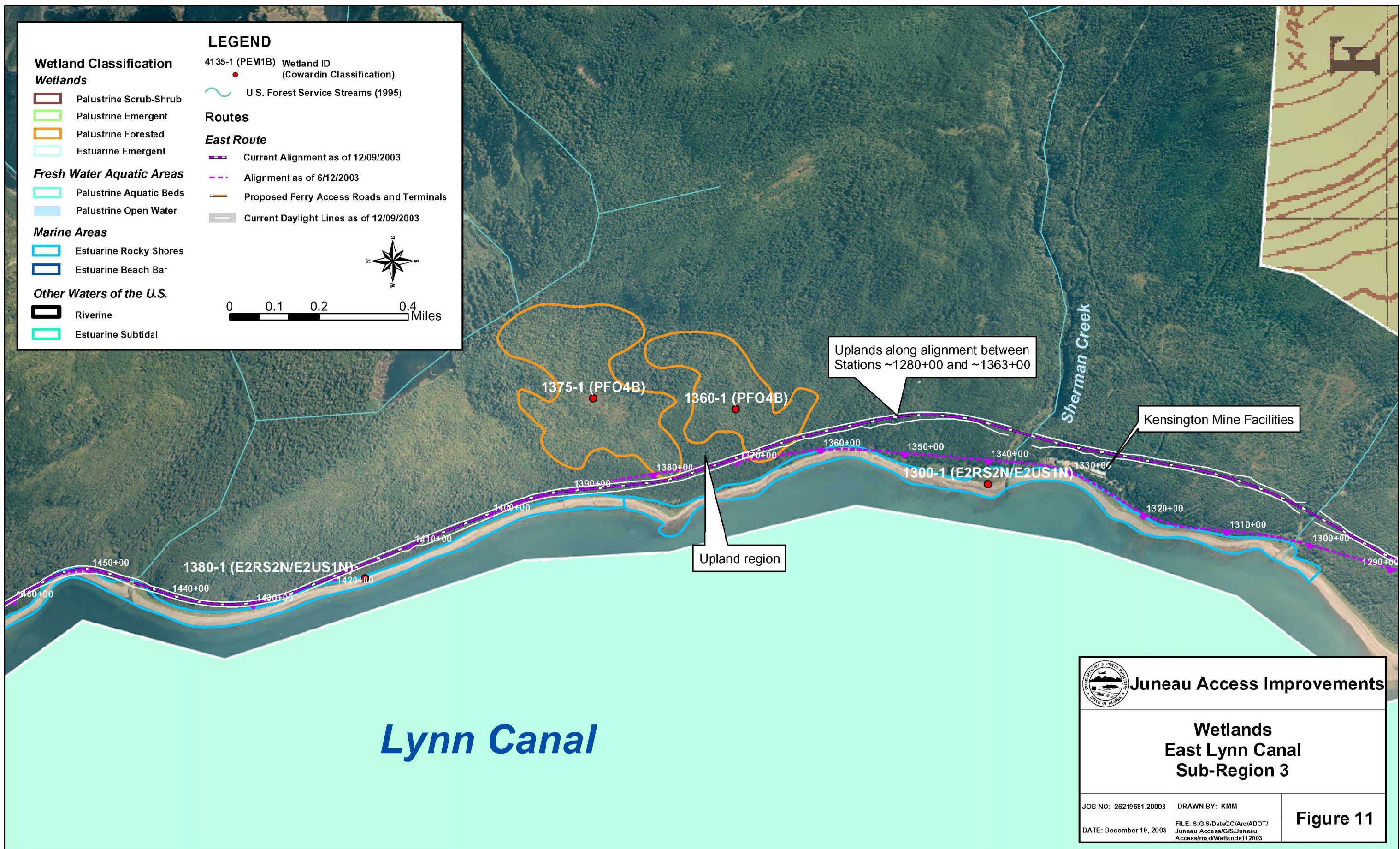
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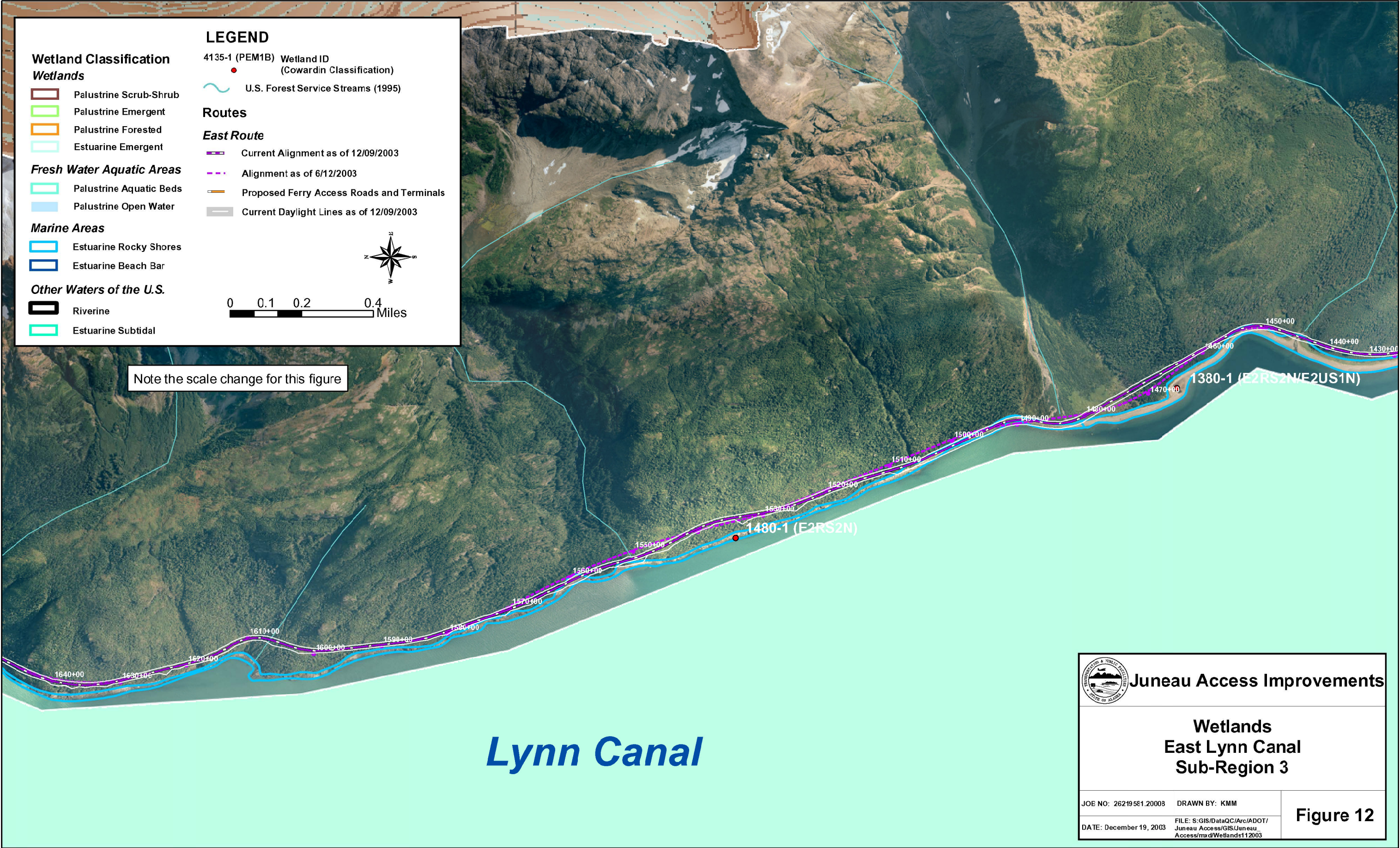


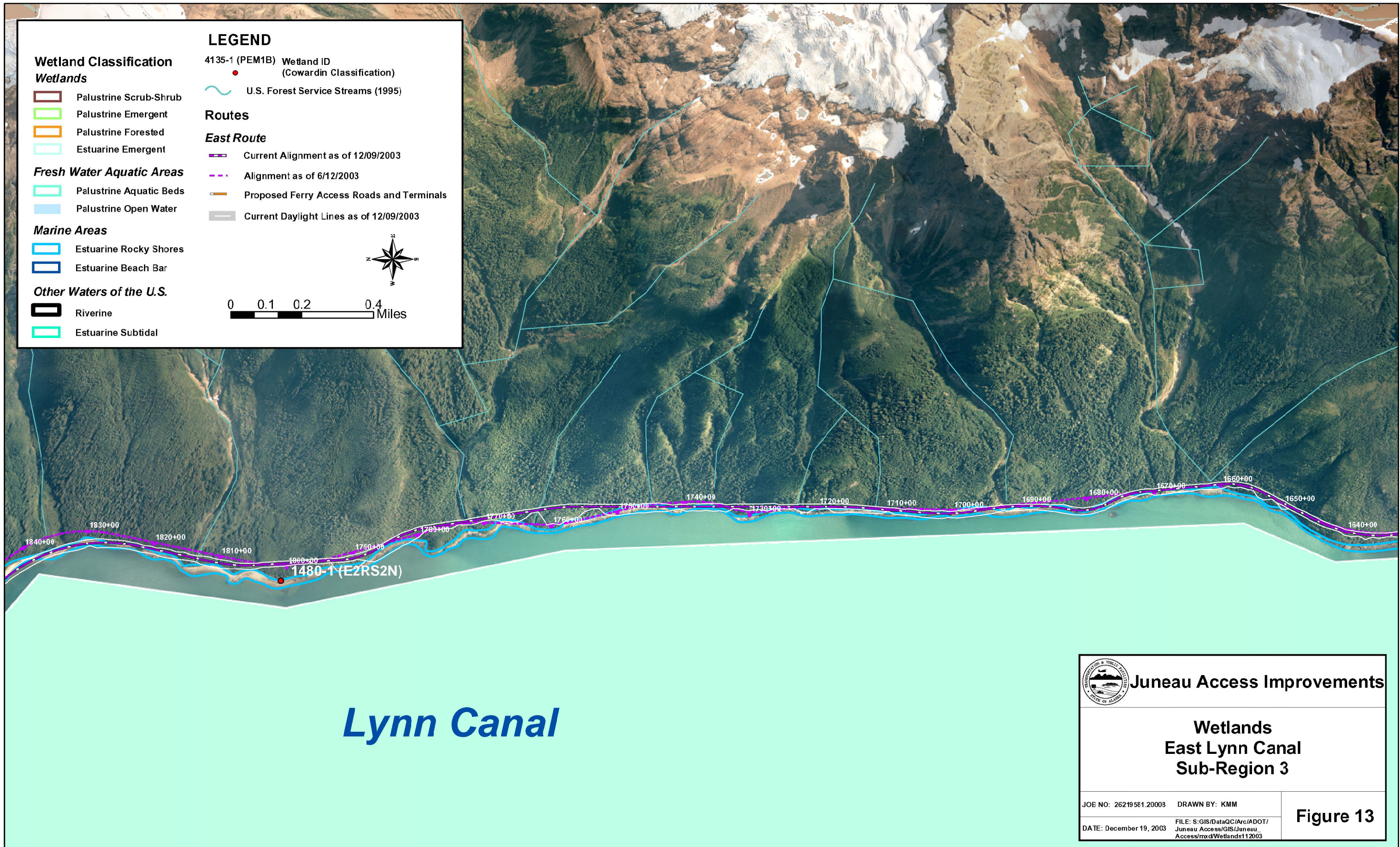
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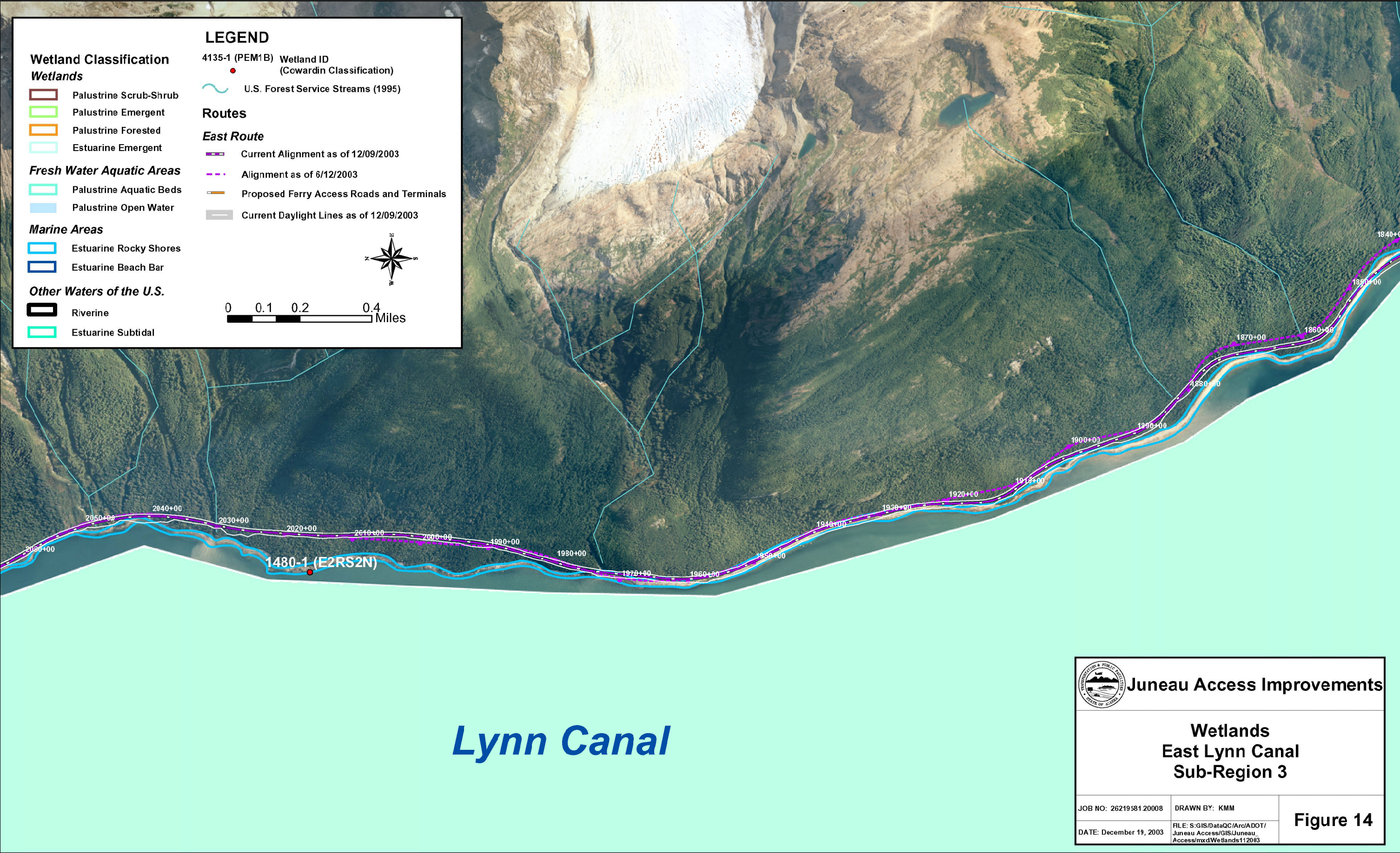
Wetlands
East Lynn Canal
Sub-Regions 2 and 3

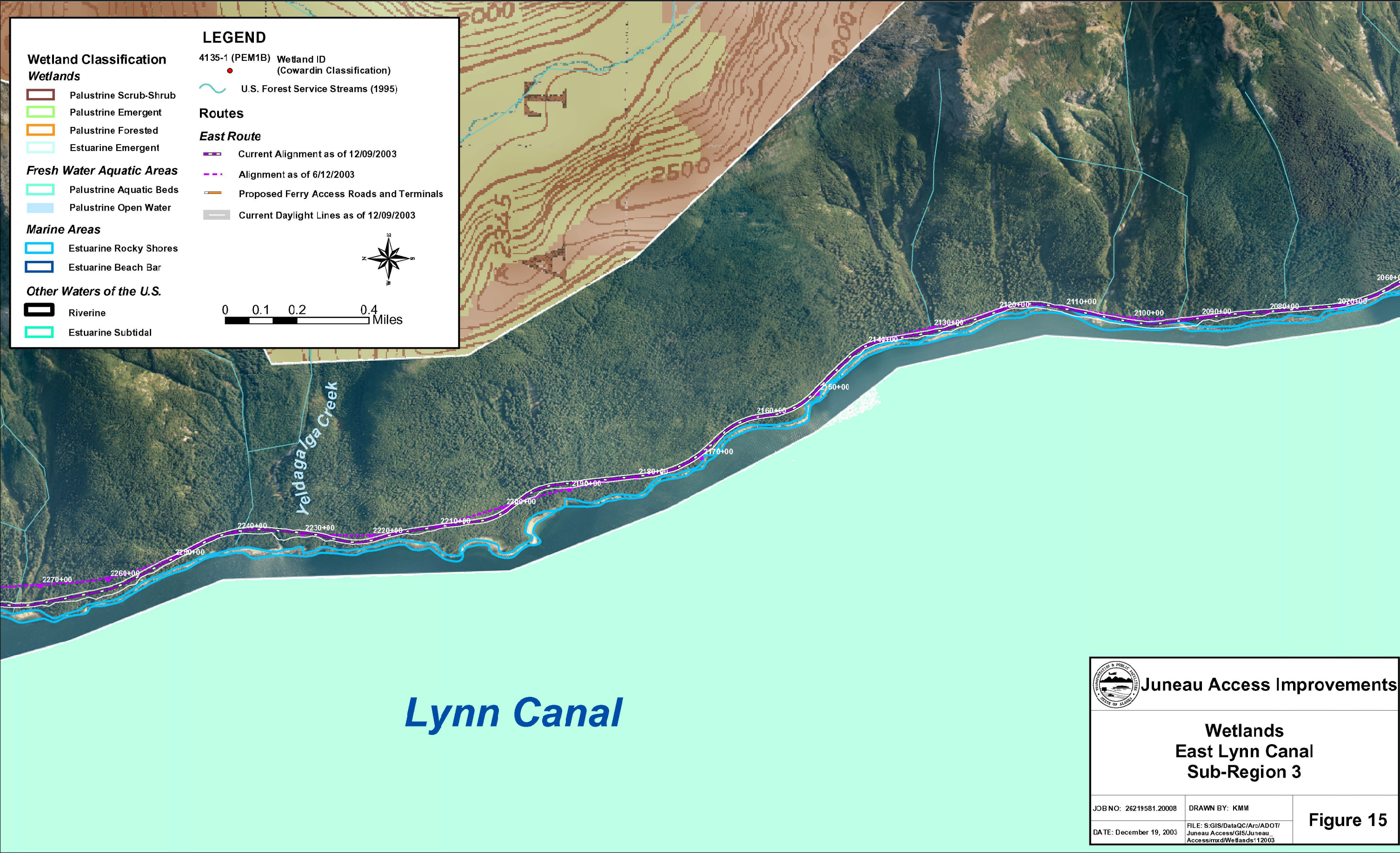
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Wetland Classification
Wetlands

- Palustrine Scrub-Shrub
- Palustrine Emergent
- Palustrine Forested
- Estuarine Emergent

Fresh Water Aquatic Areas

- Palustrine Aquatic Beds
- Palustrine Open Water

Marine Areas

- Estuarine Rocky Shores
- Estuarine Beach Bar

Other Waters of the U.S.

- Riverine
- Estuarine Subtidal

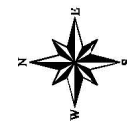
LEGEND

- 4135-1 (PEM1B) Wetland ID (Cowardin Classification)
- U.S. Forest Service Streams (1995)

Routes


East Route

- Current Alignment as of 12/09/2003
- Alignment as of 6/12/2003
- Proposed Ferry Access Roads and Terminals
- Current Daylight Lines as of 12/09/2003



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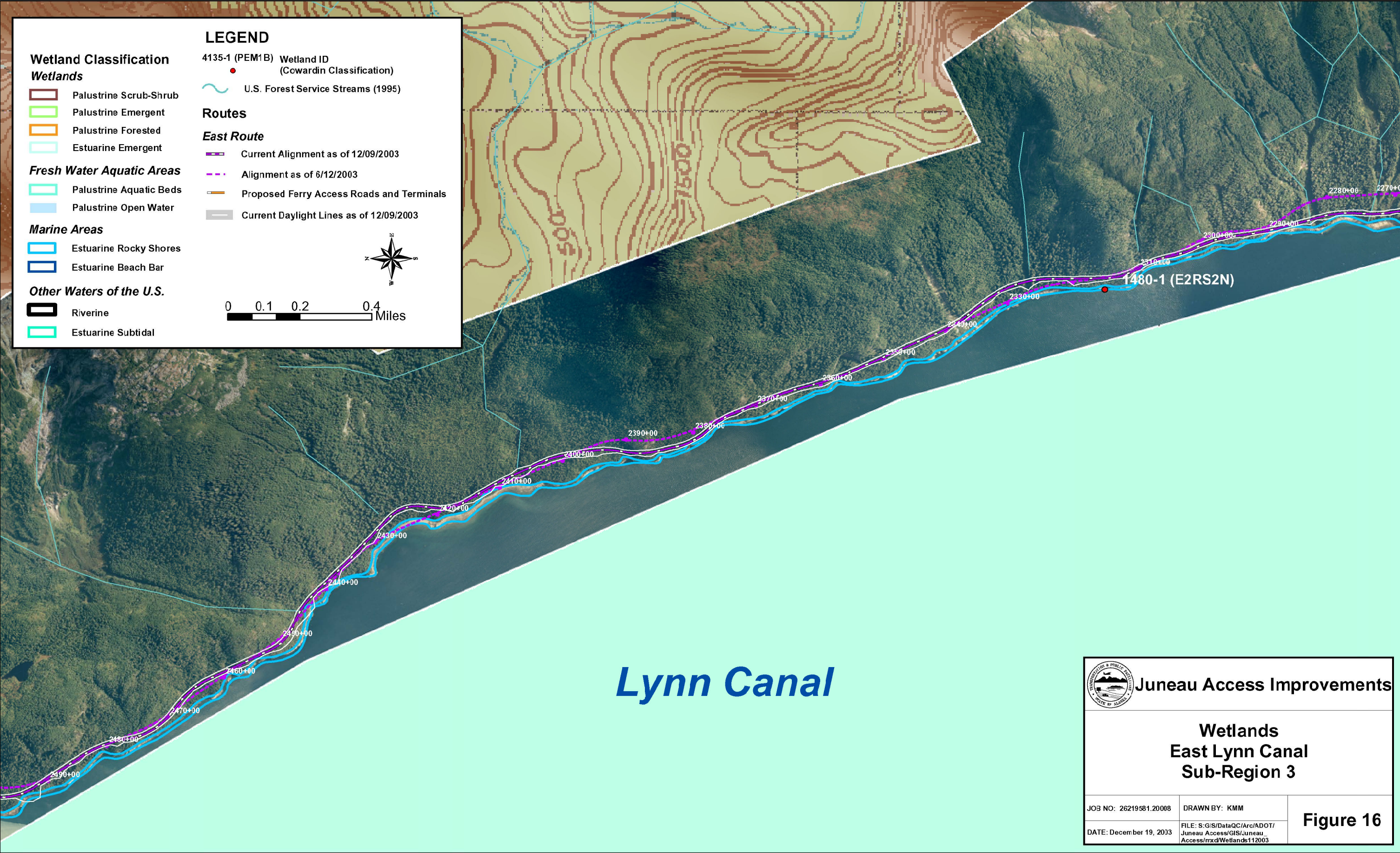
Lynn Canal




Juneau Access Improvements

Wetlands
East Lynn Canal
Sub-Region 3

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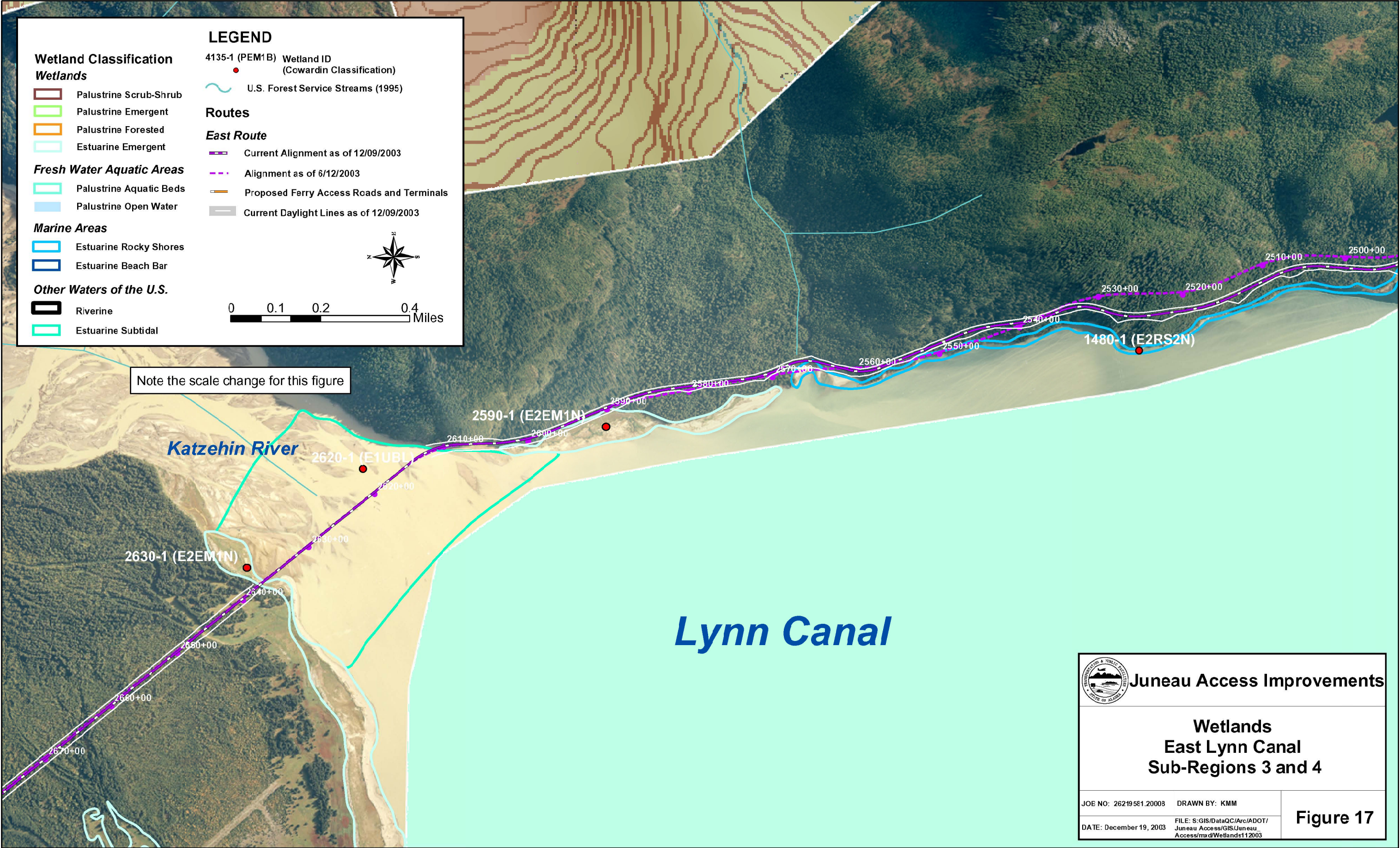


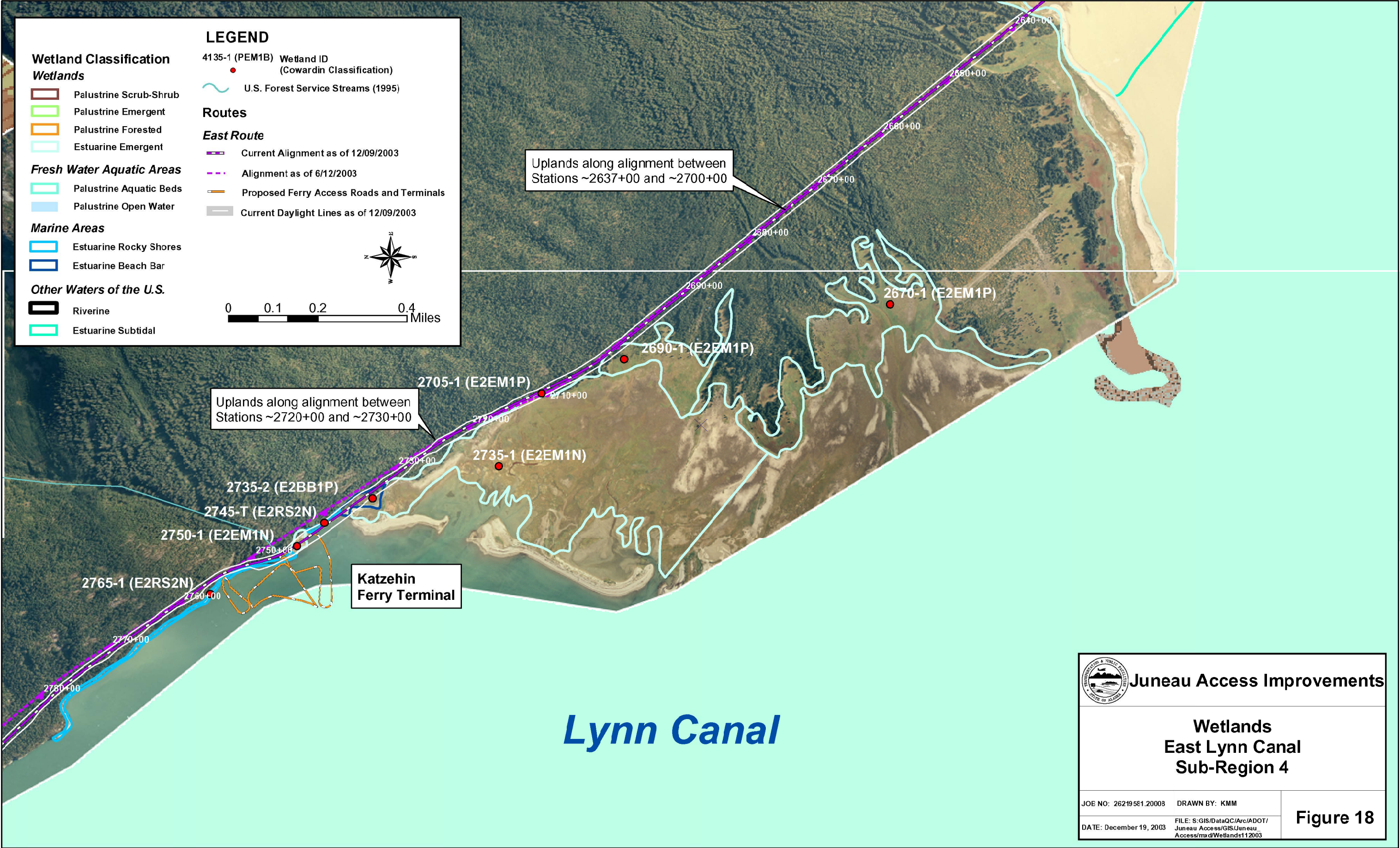


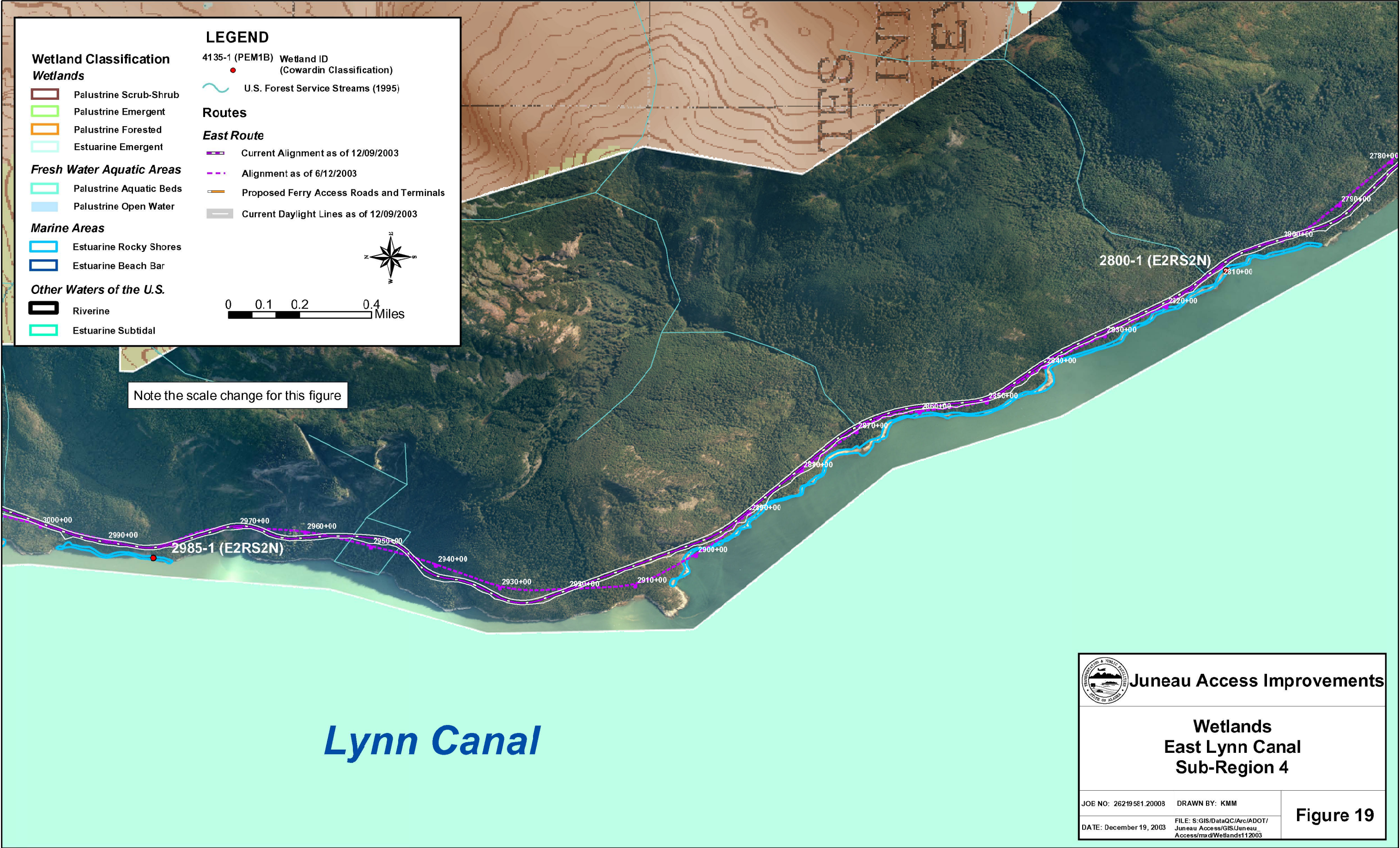
Juneau Access Improvements

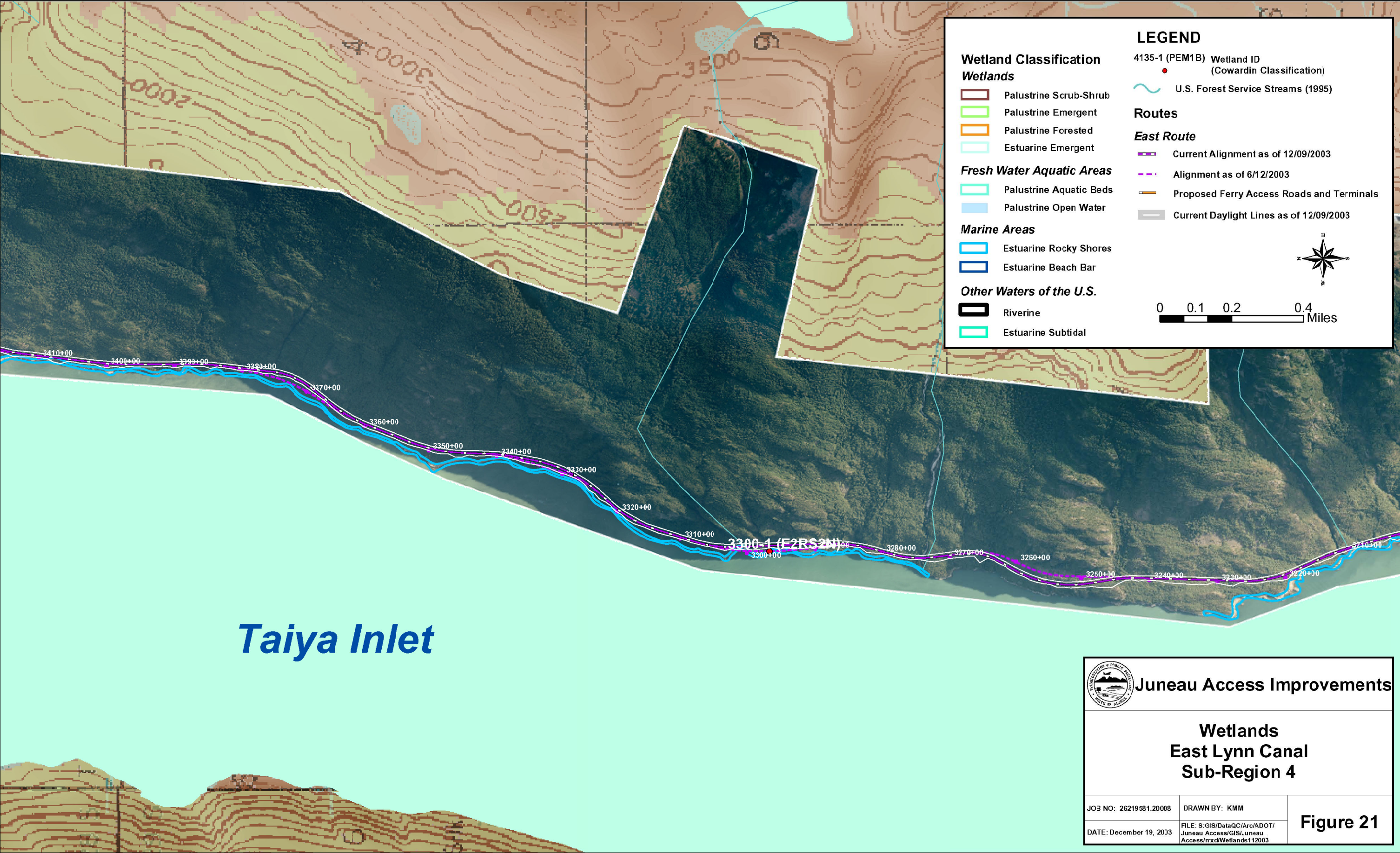
Wetlands
East Lynn Canal
Sub-Region 3

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Taiya Inlet



Juneau Access Improvements

Wetlands
East Lynn Canal
Sub-Region 4

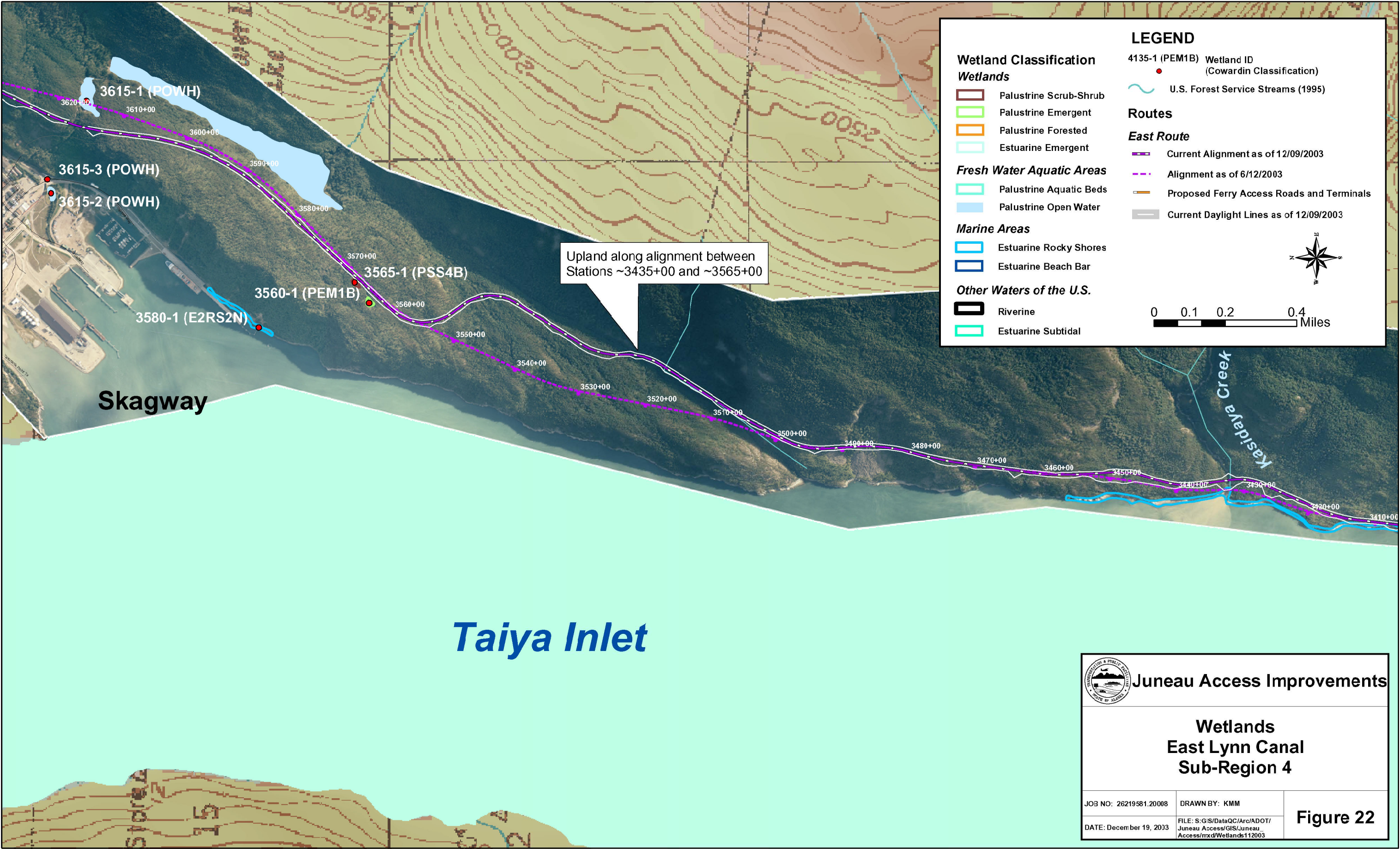
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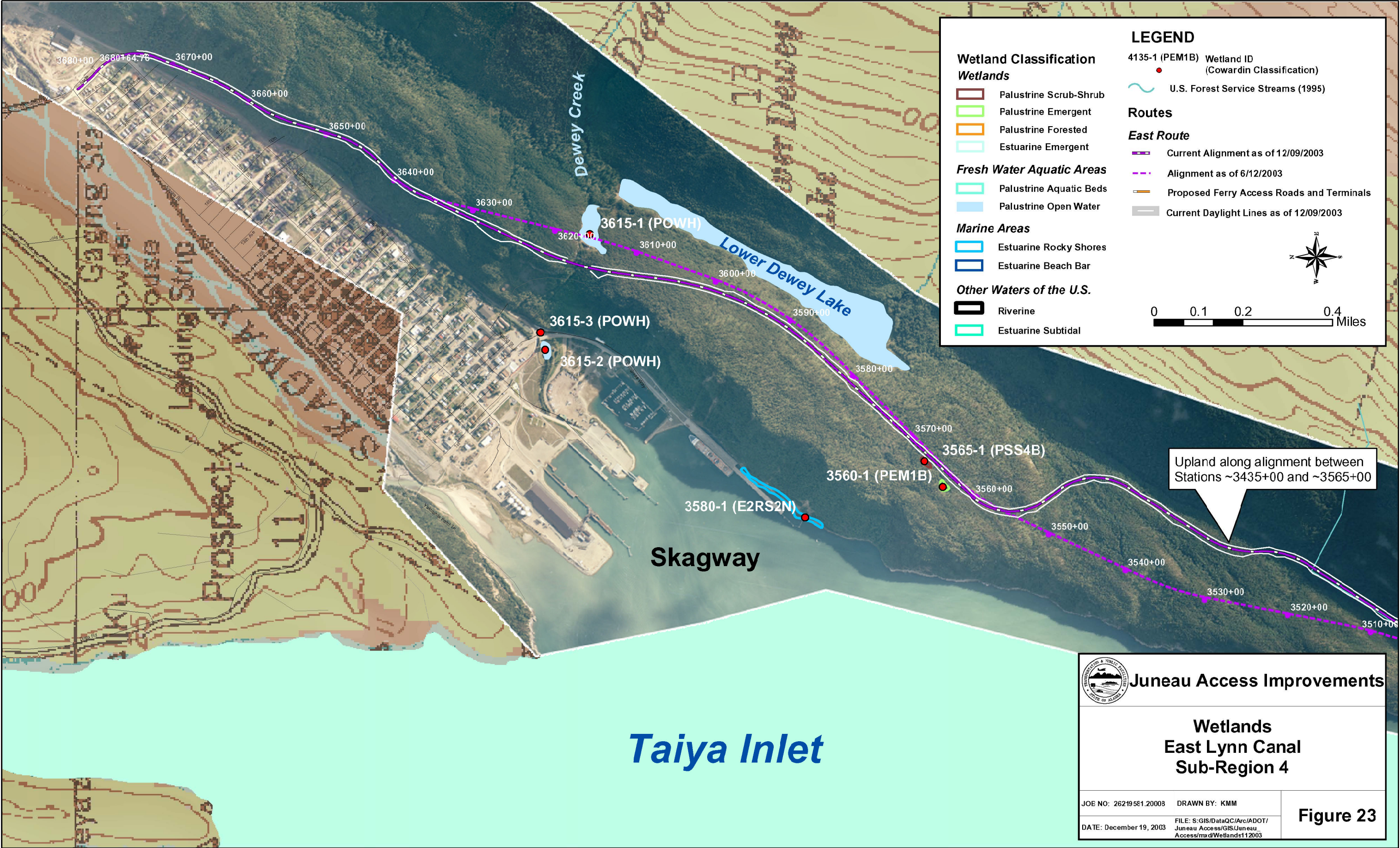
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Figure 21





Lynn Canal

Wetland Classification

Wetlands

- Palustrine Scrub-Shrub
- Palustrine Emergent
- Palustrine Forested
- Estuarine Emergent

Fresh Water Aquatic Areas

- Palustrine Aquatic Beds
- Palustrine Open Water

Marine Areas

- Estuarine Rocky Shores
- Estuarine Beach Bar

Other Waters of the U.S.

- Riverine
- Estuarine Subtidal

LEGEND

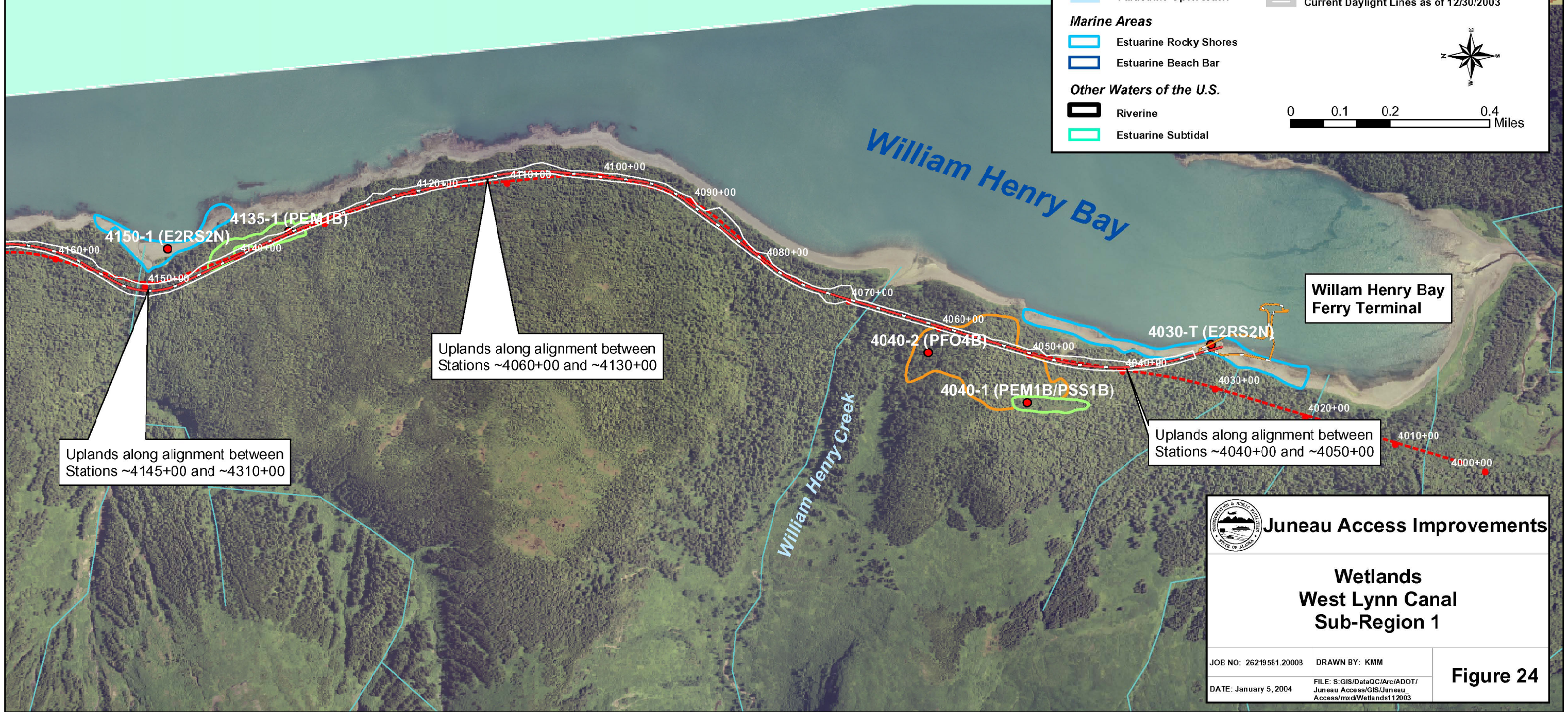
4135-1 (PEM1B) Wetland ID (Cowardin Classification)

U.S. Forest Service Streams (1995)

Routes

West Route

- Current Alignment as of 12/30/03
- 1994 Lochner Alignment
- Proposed Ferry Access Roads and Terminals
- Current Daylight Lines as of 12/30/2003



Uplands along alignment between Stations ~4145+00 and ~4310+00

Uplands along alignment between Stations ~4060+00 and ~4130+00

Uplands along alignment between Stations ~4040+00 and ~4050+00

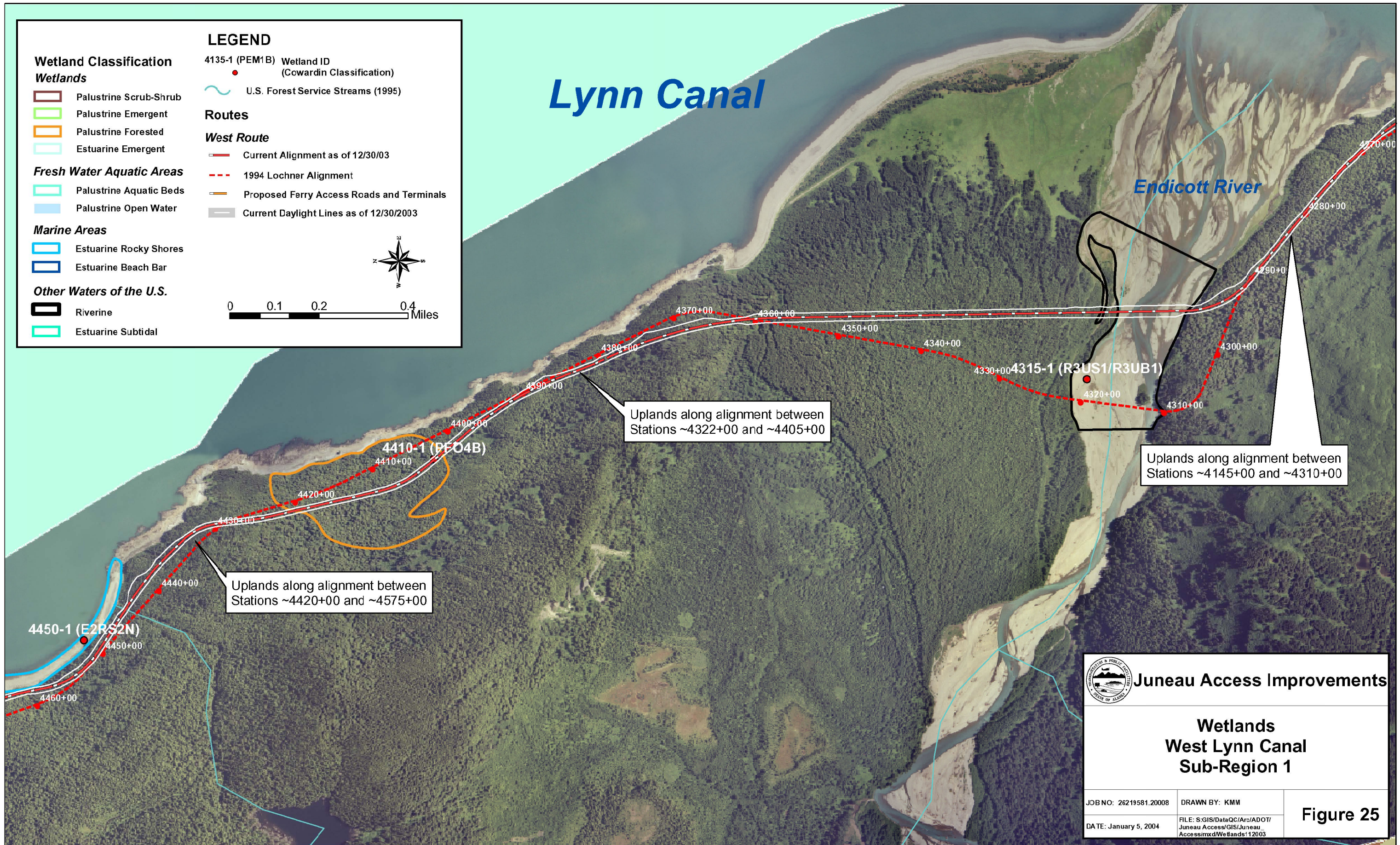
Juneau Access Improvements


Wetlands West Lynn Canal Sub-Region 1

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Figure 24

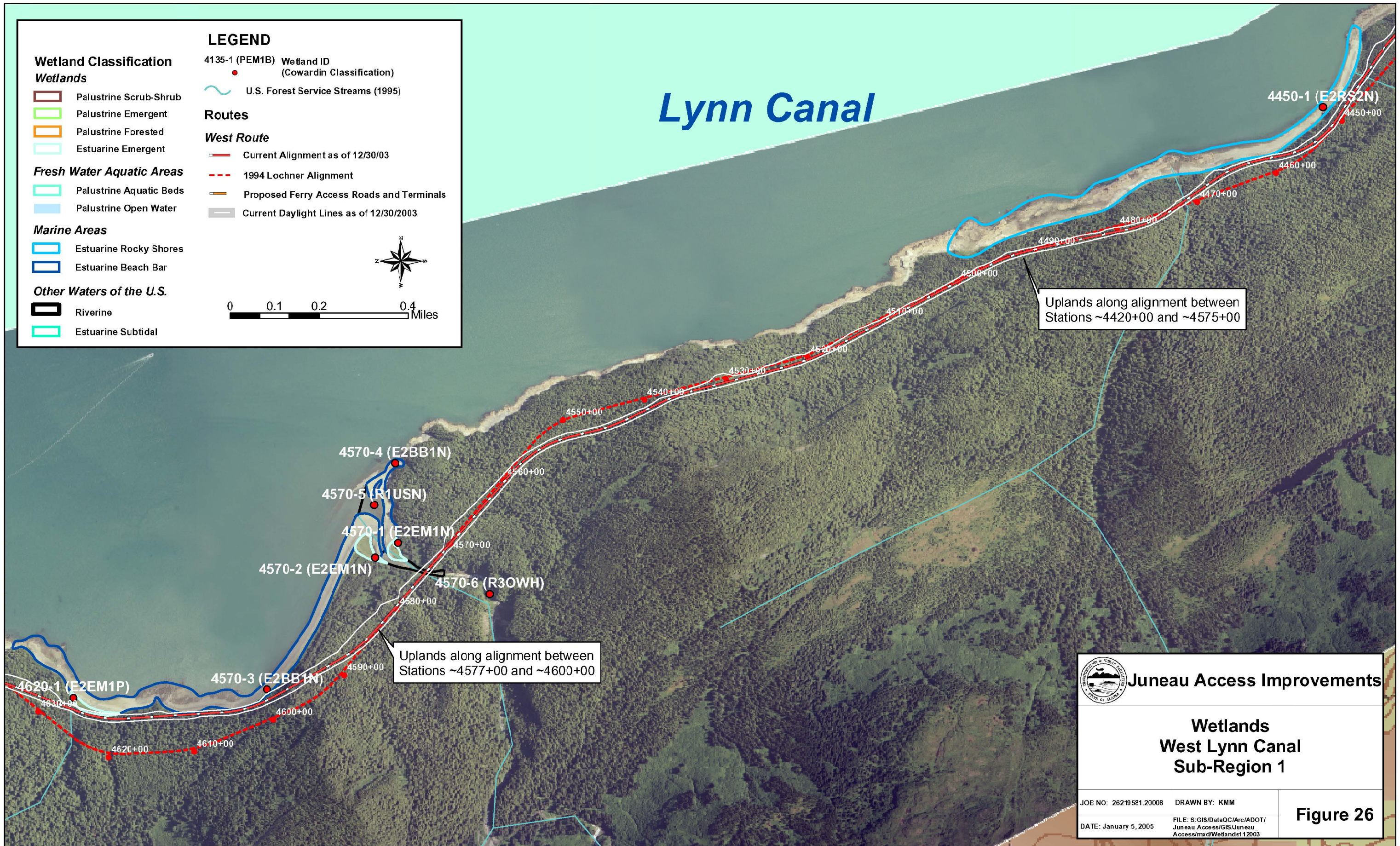


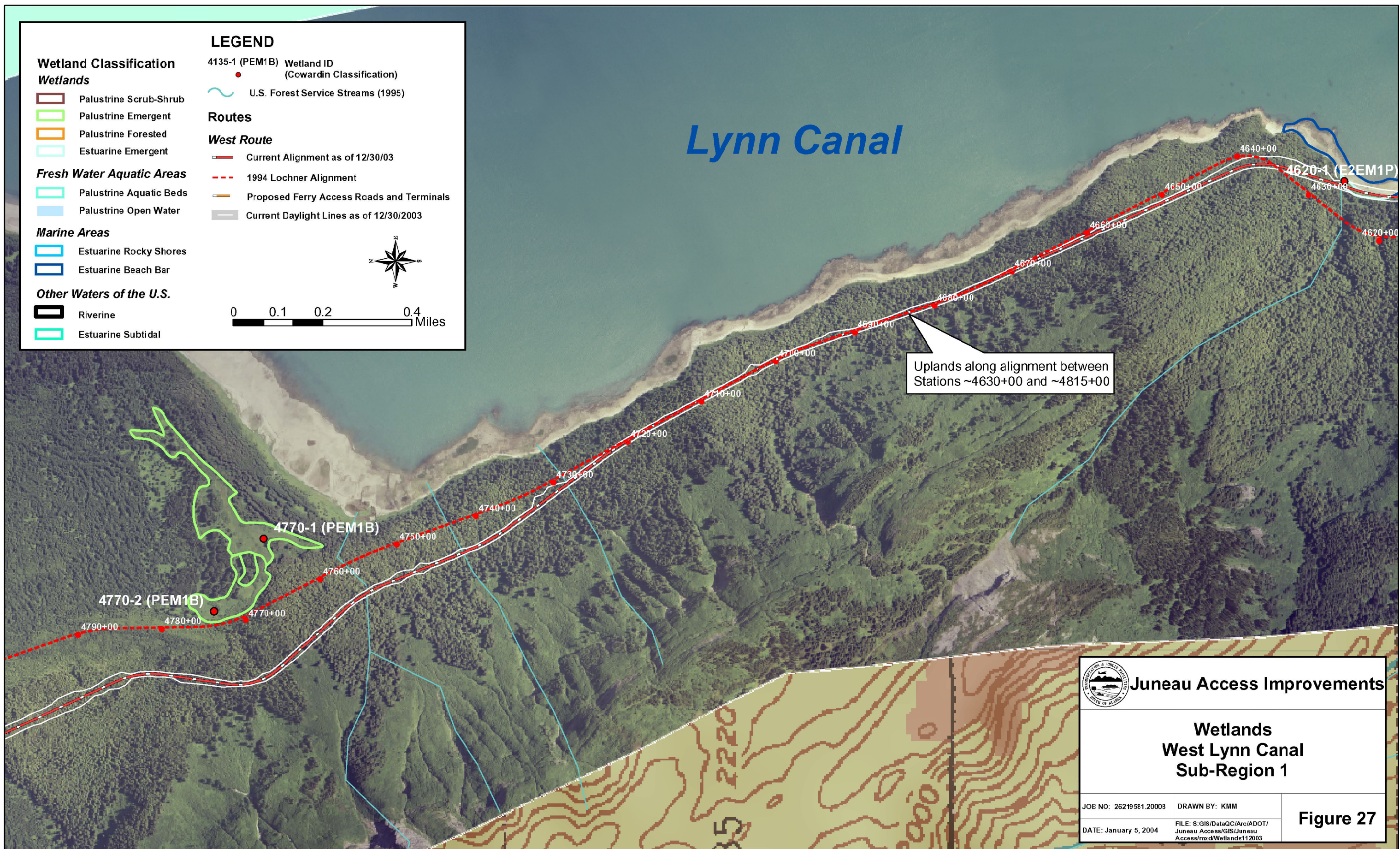
 **Juneau Access Improvements**

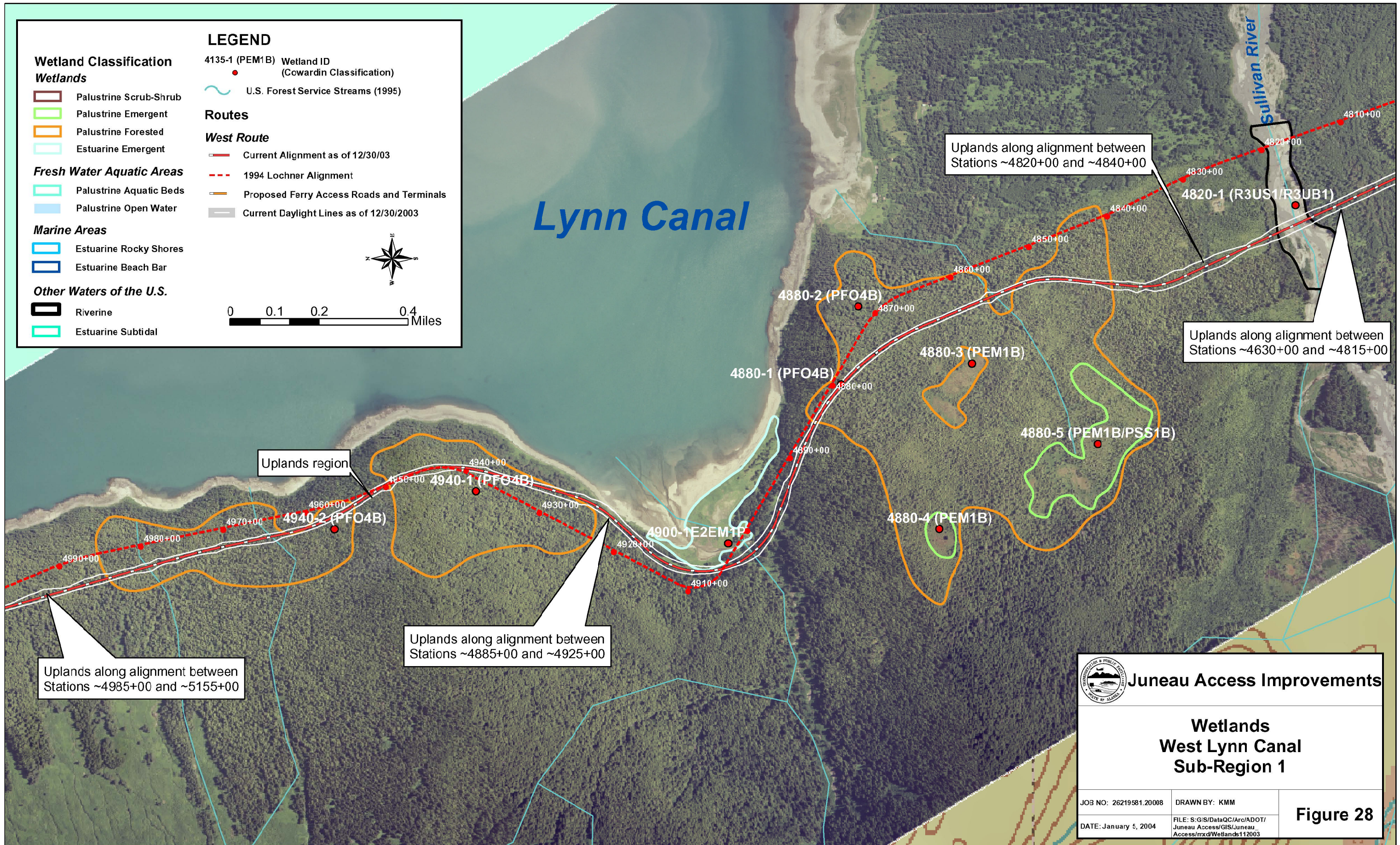
Wetlands
West Lynn Canal
Sub-Region 1


JOB NO: 26219581.20008	DRAWN BY: KMM
DATE: January 5, 2004	FILE: S:\GIS\Data\QC\Arc\ADOT\Juneau Access\GIS\Juneau Access\mxd\Wetlands\12003

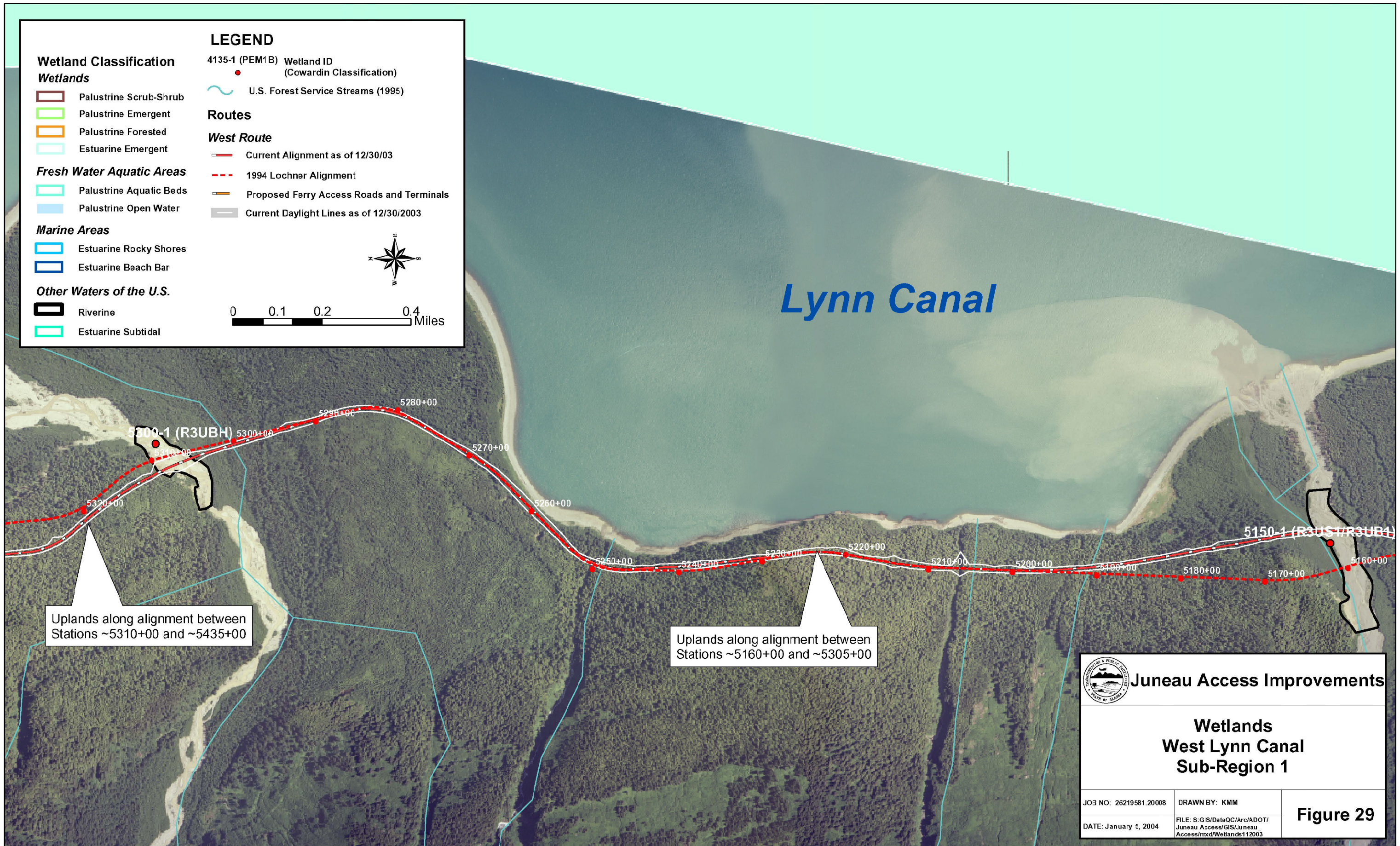
Figure 25

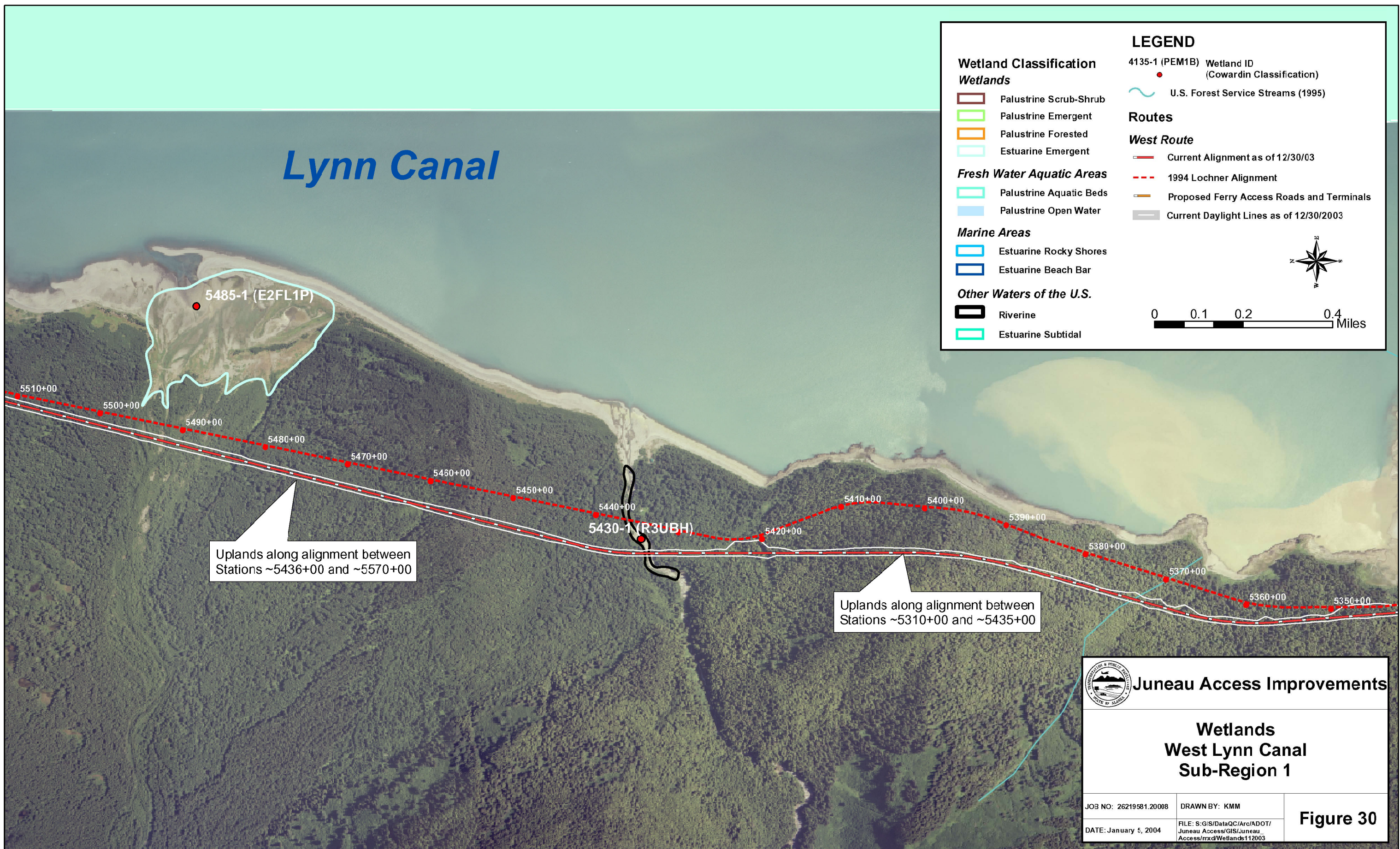






 Juneau Access Improvements		
Wetlands West Lynn Canal Sub-Region 1		
JOB NO: 26219581.20008	DRAWN BY: KMM	Figure 28
DATE: January 5, 2004	FILE: S:\GIS\DataQC\Arc\ADOT\Juneau Access\GIS\Juneau Access\mxd\Wetlands112003	





Chilkat Inlet

Davidson Glacier
Outwash Plain

Glacier River

Wetland Classification
Wetlands

- Palustrine Scrub-Shrub
- Palustrine Emergent
- Palustrine Forested
- Estuarine Emergent

Fresh Water Aquatic Areas

- Palustrine Aquatic Beds
- Palustrine Open Water

Marine Areas

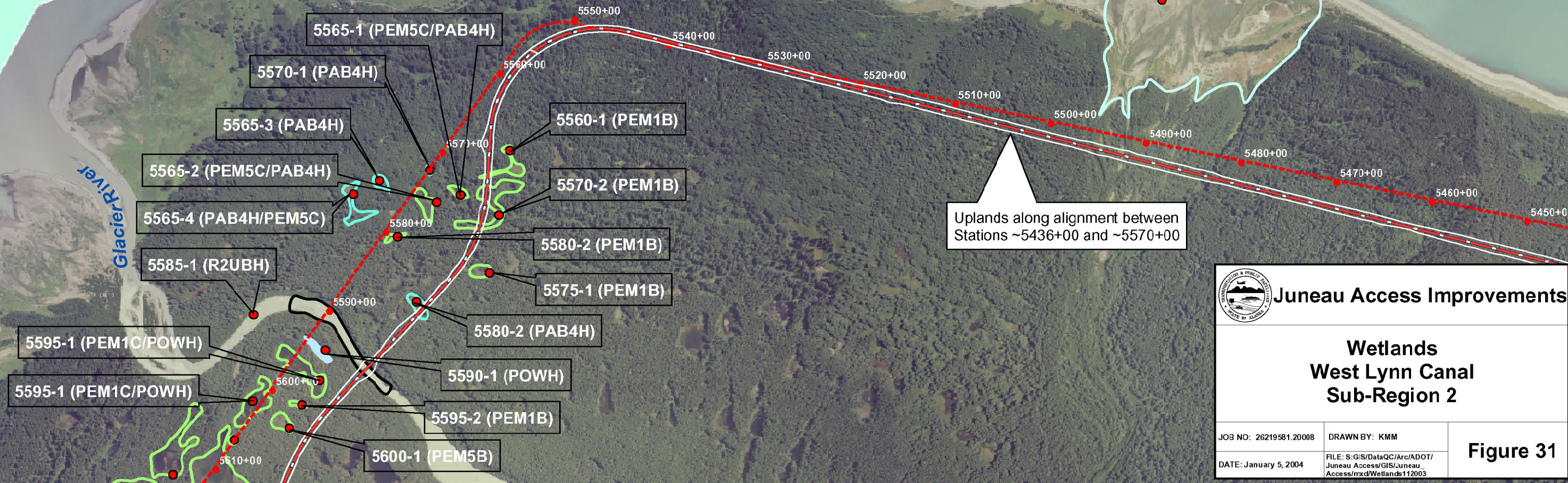
- Estuarine Rocky Shores
- Estuarine Beach Bar

Other Waters of the U.S.

- Riverine
- Estuarine Subtidal

LEGEND
4135-1 (PEM1B) Wetland ID
(Cowardin Classification)
U.S. Forest Service Streams (1995)
Routes
West Route

- Current Alignment as of 12/30/03
- 1994 Lochner Alignment
- Proposed Ferry Access Roads and Terminals
- Current Daylight Lines as of 12/30/2003



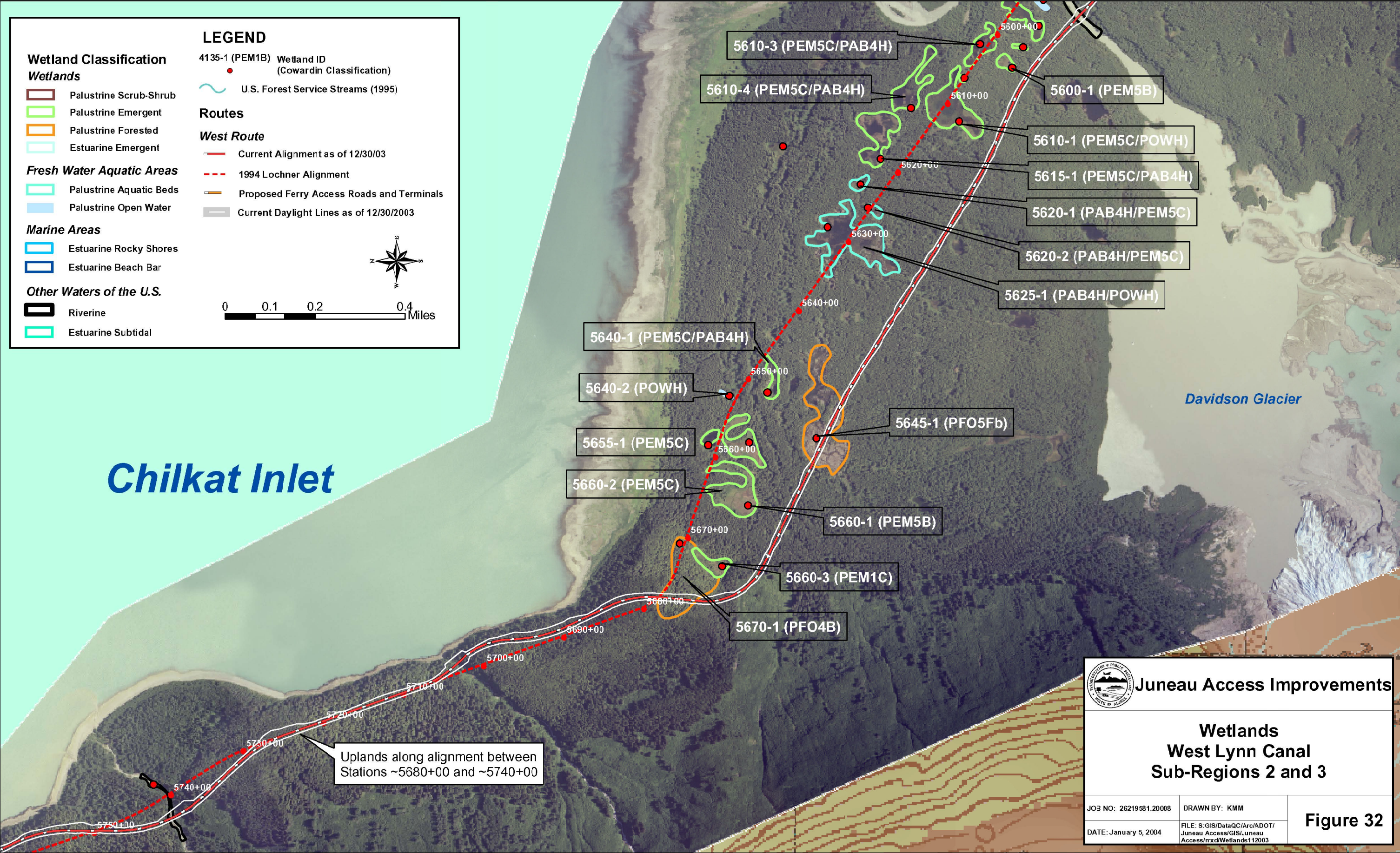
Juneau Access Improvements

Wetlands
West Lynn Canal
Sub-Region 2

JOB NO: 26219581.20008
DATE: January 5, 2004

DRAWN BY: KMM
FILE: S:\GIS\DataQC\Arc\ADOT\Juneau Access\GIS\Juneau Access\mxd\Wetlands112003

Figure 31



Wetland Classification
Wetlands

- Palustrine Scrub-Shrub
- Palustrine Emergent
- Palustrine Forested
- Estuarine Emergent

Fresh Water Aquatic Areas

- Palustrine Aquatic Beds
- Palustrine Open Water

Marine Areas

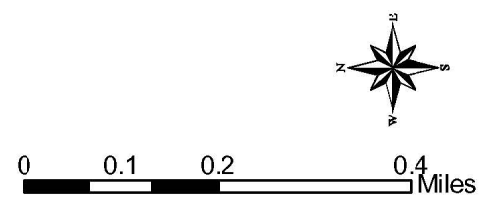
- Estuarine Rocky Shores
- Estuarine Beach Bar

Other Waters of the U.S.

- Riverine
- Estuarine Subtidal

LEGEND

- 4135-1 (PEM1B) Wetland ID (Cowardin Classification)
- U.S. Forest Service Streams (1995)
- Routes**
- West Route**
- Current Alignment as of 12/30/03
- 1994 Lochner Alignment
- Proposed Ferry Access Roads and Terminals
- Current Daylight Lines as of 12/30/2003



Juneau Access Improvements

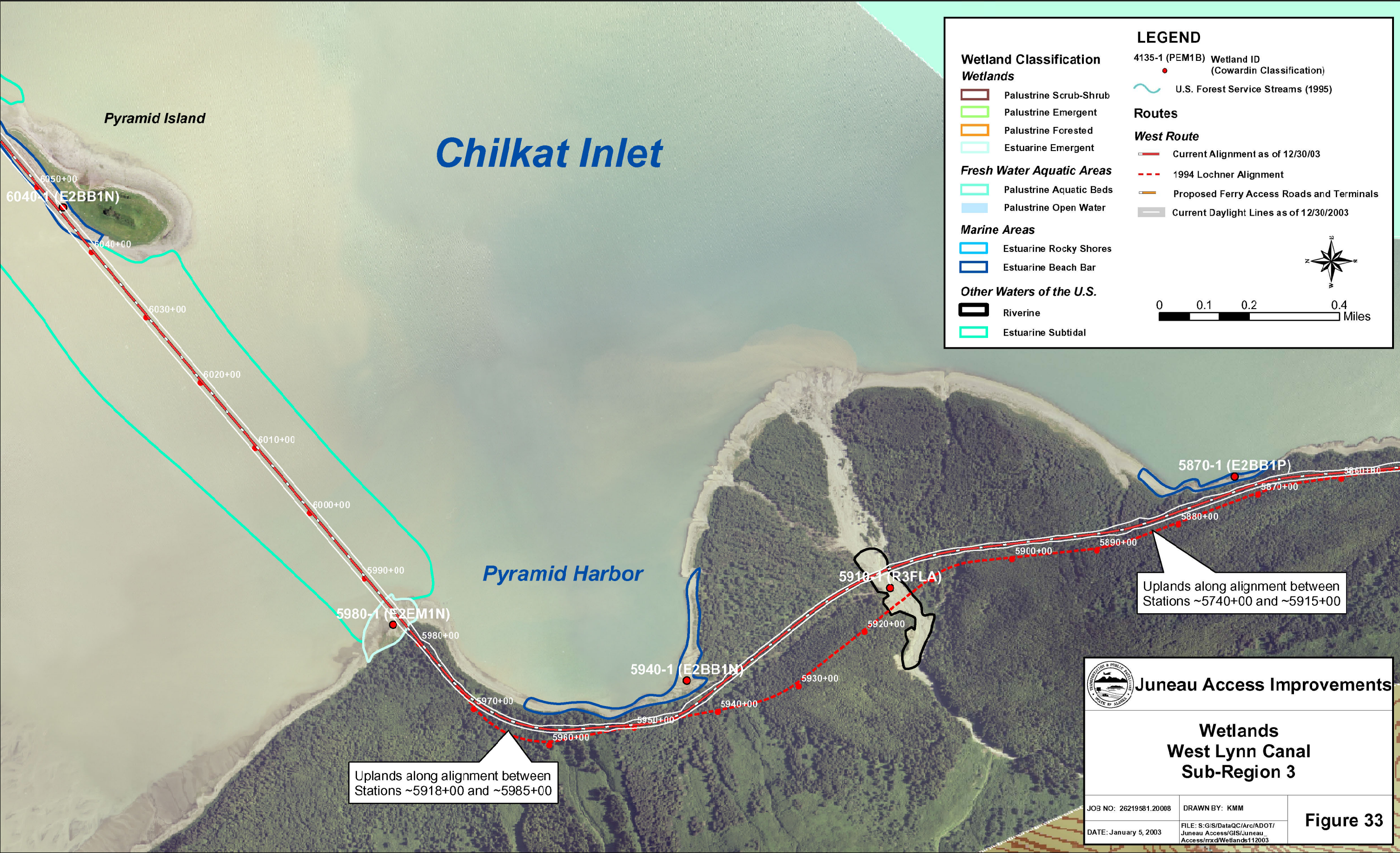
Wetlands

West Lynn Canal

Sub-Regions 2 and 3

JOB NO: 26219581.2008	DRAWN BY: KMM
DATE: January 5, 2004	FILE: S:\GIS\DataQC\Arc\ADOT\Juneau Access\GIS\Juneau Access\mxd\Wetlands112003

Figure 32



Wetland Classification
Wetlands

- Palustrine Scrub-Shrub
- Palustrine Emergent
- Palustrine Forested
- Estuarine Emergent

Fresh Water Aquatic Areas

- Palustrine Aquatic Beds
- Palustrine Open Water

Marine Areas

- Estuarine Rocky Shores
- Estuarine Beach Bar

Other Waters of the U.S.

- Riverine
- Estuarine Subtidal

LEGEND
4135-1 (PEM1B) Wetland ID
(Cowardin Classification)
U.S. Forest Service Streams (1995)
Routes
West Route

- Current Alignment as of 12/30/03
- 1994 Lochner Alignment
- Proposed Ferry Access Roads and Terminals
- Current Daylight Lines as of 12/30/2003

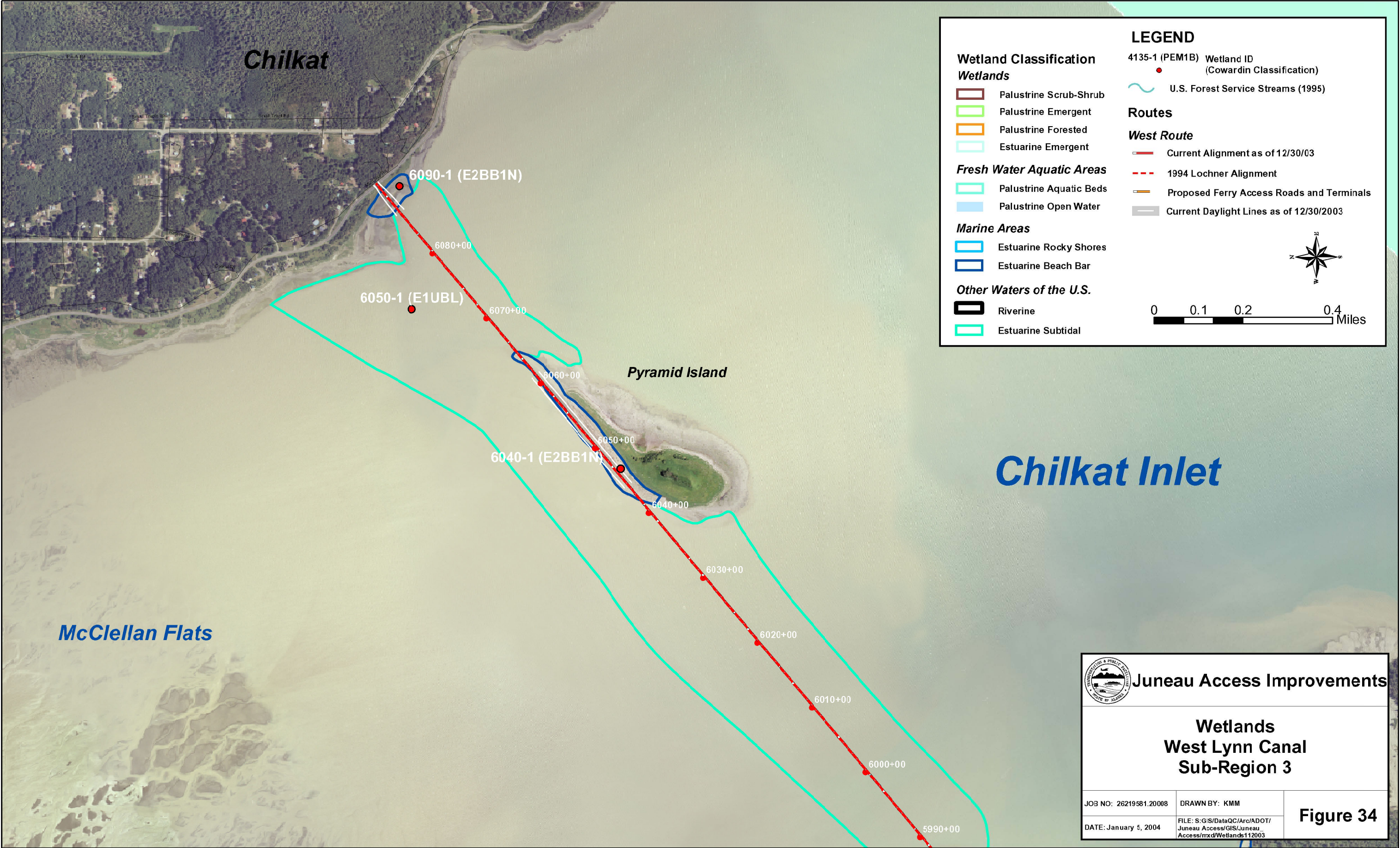
Juneau Access Improvements

Wetlands
West Lynn Canal
Sub-Region 3

JOB NO: 26219581.20008
DATE: January 5, 2003

DRAWN BY: KMM
FILE: S:\GIS\DataQC\Arc\ADOT\Juneau Access\GIS\Juneau Access\mxd\Wetlands112003

Figure 33



ATTACHMENT A
WETLAND FIELD DATA SHEETS

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Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: _____ Weather Conditions: _____

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: _____ Plot ID: _____ Cowardin Class: _____

Do Normal Circumstances exist on the site? Yes No

Is the site significantly disturbed (Atypical Situation)? Yes No

Is the area a potential Problem Area? Yes No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: _____ Other indicators: _____

Hydrophytic vegetation?: Yes _____ No _____ Basis: _____

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name _____
(Series and Phase): _____ Drainage Class: _____
Field Observations _____
Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No (Circle)
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this Sampling Point Within a Wetland?	Yes	No

Vegetation Photo #: _____ Looking: _____
Soil Photo #: _____
(optional) Photo# _____: Explain: _____

Remarks:

Juneau Access EIS Wetland Functional Assessment Data Form

(Based on Juneau International Airport EIS with 2002 Modifications to Adamus 1987)

Wetland ID# _____ Adamus Wetland ID _____

Cowardin Classification _____ Date of Assessment _____

Observer(s) _____

Function	Rating	Field Criteria (check all that apply)
Groundwater Recharge	High to Moderate	<input type="checkbox"/> Located at or near topographic divide <input type="checkbox"/> Topographically perched, inundated but water not stagnant <input type="checkbox"/> Evidence of varying water levels: drift lines, watermarks, etc. <input type="checkbox"/> Estuarine wetland with alluvial, gravel or sandy substrate <input type="checkbox"/> Muskeg wetlands
	Low	<input type="checkbox"/> Located at or near sea level, wetland has an outlet, and underlying non-porous substrate <input type="checkbox"/> Estuarine wetland with substrate of fragipan, bedrock, or marine sediments
Groundwater Discharge & Lateral Flow	High to Moderate	<input type="checkbox"/> Completely or partly located within 200 feet of stream (discharge) <input type="checkbox"/> Located ~halfway on slope between topo divide and stream (lateral flow) <input type="checkbox"/> Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)
	Low	<input type="checkbox"/> Wetland is hydrologically isolated from estuaries and streams <input type="checkbox"/> Estuarine wetland with substrate of fragipan, bedrock or marine sediments <input type="checkbox"/> Enclosed on all sides by development
Surface Hydrologic Control	High	<input type="checkbox"/> Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3% or <input type="checkbox"/> Wetland is nontidal and groundwater discharge = low (i.e., soils not saturated for most of year), an outlet may or may not be present and <input type="checkbox"/> wetland has peat or other hydric soils and shrubby vegetation and slopes <3% or <input type="checkbox"/> slope is 3-7% but wetland is large relative to its watershed (either 5+% by area or smaller and wetlands generally absent upslope)
	Moderate-High	<input type="checkbox"/> Wetland is nontidal and groundwater discharge = low (i.e., soils not saturated for most of year), an outlet may or may not be present and <input type="checkbox"/> wetland has peat or other hydric soils and shrubby vegetation and slopes <7% <input type="checkbox"/> Wetland is nontidal and groundwater discharge = low and slope angle <7% <input type="checkbox"/> Outlet is constricted or absent and wetland does not meet criteria above for High
	Moderate-Low	<input type="checkbox"/> Wetland is usually or mostly nontidal but is within 25 vertical feet of sealevel and slope angle is <3%, or <input type="checkbox"/> Groundwater discharge is rated Moderate or High and slope <7%
	Low	<input type="checkbox"/> Tidal wetlands and wetlands with >7% slope
Sediment or Toxicant Retention	High	<input type="checkbox"/> Wetland has no permanent outlet, has a slope of 0-3%, is in a landscape depression (at least 25% of abutting land slopes into the wetlands w/o being intercepted by a ditch or berm), and is downstream of potential sediment and/or toxicant sources, or <input type="checkbox"/> Peat soils prevail, much of wetland is in a landscape depression, and slope angle is 0-3%
	Moderate-High	<input type="checkbox"/> Slope is less than 7%, dense vegetation is present, the wetland has an outlet and is: <input type="checkbox"/> in the lower 2/3 of a watershed with typically too high turbidity, or <input type="checkbox"/> downstream of potential or known toxicants <input type="checkbox"/> Wetland is tidal or primarily lacustrine or regularly supports beaver
	Moderate-Low	<input type="checkbox"/> Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources
	Low	<input type="checkbox"/> Slope is generally >7% or wetland is mostly unvegetated

Function	Rating	Field Criteria (check all that apply)
Nutrient Transformation & Export	High	<input type="checkbox"/> Wetland is connected by channel flow to a creek or river, and it: <ul style="list-style-type: none"> <input type="checkbox"/> Is large relative to its watershed (5+% by area or smaller), or <input type="checkbox"/> Has deep or open water habitats with low flow velocities, or <input type="checkbox"/> Has dense emergent and/or dense woody vegetation, or <input type="checkbox"/> Is a mudflat with algae mats, or <input type="checkbox"/> Has a restricted outlet
	Moderate	<input type="checkbox"/> Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function
	Low	<input type="checkbox"/> Wetland has no surface water outlet (not even intermittent) to the estuary or freshwater body
Riparian Support	High	<input type="checkbox"/> Upslope or downslope, nontidal areas mostly urban/open land, stream (if any) contains several densely shaded reaches, or <input type="checkbox"/> Upslope or downslope areas are mostly forested, stream (if any) contains several unshaded reaches, or <input type="checkbox"/> It is an estuarine emergent wetland
	Moderate-High	<input type="checkbox"/> Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary
	Moderate-Low	<input type="checkbox"/> Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High
	Low	<input type="checkbox"/> Wetland is hydrologically isolated from streams and estuaries
Fish Habitat (anadromous, resident, and marine finfish; also shellfish)	Very High	<input type="checkbox"/> Excellent habitat for rearing, migration, and/or spawning; utilized by key lifestage of high value or unique stock of fish or shellfish
	High	<input type="checkbox"/> Good habitat for rearing, migration, and/or spawning, used by substantial numbers of fish during at least one season (e.g. overwinter rearing, spring migration, fall spawning), or <input type="checkbox"/> NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish
	Moderate-High	<input type="checkbox"/> Fair habitat for rearing, migration, and/or spawning
	Moderate-Low	<input type="checkbox"/> Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair, or <input type="checkbox"/> Access is not restricted, but habitat is poor
	Low	<input type="checkbox"/> Access is restricted and habitat is poor even for resident fish
	Very Low	<input type="checkbox"/> No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)
Wildlife	Very High	<input type="checkbox"/> Existing survey data indicate that the wetland receives disproportionately high use by waterfowl and shorebirds during migration, or <input type="checkbox"/> The wetland is used for winter survival feeding by Vancouver Canada goose, or <input type="checkbox"/> The wetland receives heavy seasonal or year-round use by species of conservation concern
	High	<input type="checkbox"/> Existing survey data indicate that the wetland is frequently used by waterfowl and shorebirds and/or a high number of great blue heron, Vancouver Canada Goose, mallard, or bald eagle relative to other, similar wetlands in the area, or <input type="checkbox"/> The wetland has, or recently had, an active bald eagle nest, or <input type="checkbox"/> The wetland is used by otter or mink, or <input type="checkbox"/> The wetland contains <i>Carex lyngbyei</i> , <i>Plantago maritima</i> , <i>Triglochin maritima</i> , or <i>Ruppia maritimus</i> , or <input type="checkbox"/> The wetland contains > 2 contiguous acres of permanent standing fresh or brackish water or permanently flooded fresh emergent marsh (or is within 300 feet of such) and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Function	Rating	Field Criteria (check all that apply)
	Moderate-High	<input type="checkbox"/> Existing survey data indicate that great blue heron, Vancouver Canada goose, mallard or bald eagle use this wetland on occasional basis, or <input type="checkbox"/> Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m) <input type="checkbox"/> Breeding bird surveys indicate at least occasional use by any of the following spp.: red-throated loon, green-winged teal, greater yellowlegs, least sandpiper, common snipe, solitary sandpiper, belted kingfisher
	Moderate-Low	<input type="checkbox"/> Existing survey data indicated infrequent use by great blue heron, Vancouver Canada goose, mallard, or bald eagle, or <input type="checkbox"/> There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)
	Low	<input type="checkbox"/> Wetlands not meeting any of the other criteria
Regional Ecological Diversity	High	<input type="checkbox"/> Existing data shows that this wetland supports the highest seasonal concentrations of migratory birds, or <input type="checkbox"/> This wetland is known to have seasonal or year-round importance to federally listed threatened or endangered species and/or other species of conservation concern, or <input type="checkbox"/> This wetland is important to eulachon, herring, steelhead, Montana Creek chum salmon, Mendenhall sockeye, or Dolly Varden, or <input type="checkbox"/> One of the following plant species is present; Lyngbye sedge (<i>Carex lyngbyei</i>), smooth sedge (<i>C. laevisculmis</i>), Bebb's sedge (<i>C. bebbii</i>), Chara (<i>Chara sp.</i>), sweet gale (<i>Myrica gale</i>), Kamchatka spike-rush (<i>Eleocharis kamtschatica</i>), green-keeled cottongrass (<i>Eriophorum viridicarinatum</i>), Kamchatka alkali grass (<i>Puccinellia kamtschatica</i>), farnothern buttercup (<i>Ranunculus hyperboreus</i>), ditch grass (<i>Ruppia maritima</i>), common eel-grass (<i>Zostera marina</i>), narrow-leaved burreed (<i>Sparganium angustifolium</i>), marsh cinquefoil (<i>Comarum palustre</i>), or Burreed community <input type="checkbox"/> The wetland is needle-leaved evergreen seasonally flooded scrub-shrub type; needle-leaved evergreen semipermanently flooded scrub-shrub; non-persistent emergent saturated; non-persistent emergent permanently flooded; floating vascular aquatic bed; needle-leaved evergreen seasonally flooded forested, or <input type="checkbox"/> The wetland is tidal (estuarine) emergent and directly abuts a nontidal (palustrine) emergent wetland, or is nontidal emergent and abuts a tidal emergent wetland
	Moderate-High	<input type="checkbox"/> One of the following communities is present: deciduous woodland, deciduous scrub-shrub or <input type="checkbox"/> The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft, or <input type="checkbox"/> Any wetlands not isolated from natural landcover and classified by the NWI classification as having a shrub-scrub component bordering (within 300 ft) of a stream or pond or <input type="checkbox"/> The wetland is an intertidal emergent wetland but is unconnected (except for by narrow channel(s)) by a nontidal wetland
	Moderate-Low	<input type="checkbox"/> The wetland contains one of the following habitat features: 10 logs, >8 snags, >2 upturned trees (with root wads), largest tree >40 in. dbh, >90% evergreen canopy, >80% deciduous canopy, site dominated by deciduous trees 18-24 ft, at least 3 pools larger than 16 square ft, or <input type="checkbox"/> Any wetland classified by NWI classification as having a forested component bordering a stream or pond
	Low	<input type="checkbox"/> Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Function	Rating	Field Criteria (check all that apply)
Erosion Sensitivity	High	<input type="checkbox"/> Wetland (regardless of vegetation cover) generally contains slope angles exceeding 20%
	Moderate-High	<input type="checkbox"/> Wetland contains slopes of 3-20% and not dominantly forested, and having either a) groundwater discharge conditions, or b) more highly erosive soils (e.g., Kupreanof, Kina, Kogish, Fu, Maybeso), or <input type="checkbox"/> Stream has 5 or more of the following conditions: a) upper banks exceeding 60% slope or are composed of fine sediments; b) lower banks have continuous bank cutting or cutting at toe of slide areas at meander bends; c) lower banks are composed of sands, silt, clay (<20% gravel); d) streambed composed of sands, silt, clay, fine gravel; e) stream width/depth ratio is >25 and channel is moderately to highly sinuous, gradient <3%; f) gravel or sand bars present, unvegetated, and >3 ft high; g) logs and debris positioned such as to cause scouring and bank cutting; h) alders, devil's club, bare ground, pavement, or open stands of spruce predominated on gentle floodplains
	Moderate-Low	<input type="checkbox"/> Wetland contains slope angles of 3-20% and is dominated by forest, or <input type="checkbox"/> Stream has less than 5 conditions a-h in the moderate-high category above, or less than 5 of the following conditions: a) slope angle is less than 60% and appears stable or of bedrock; b) lower banks are predominantly vegetated and there is little or no continuous bank cutting; c) lower banks are comprised of muskeg or grasses or sediments are larger than 2.5 in diameter; d) moderately to well-packed e) stream width/depth ratio < 15 and gradient greater than 5%; f) gravel bars are absent or densely vegetated; g) debris is incorporated into banks or streambed and influence >20% of the channel; h) vegetation comprises dense grass flats or muskeg.
	Low	<input type="checkbox"/> Contains slope angles generally <3%, or <input type="checkbox"/> Stream meets 5 or more of conditions a-h in the moderate-low category above
Ecological Replacement Cost	High	<input type="checkbox"/> Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh or <input type="checkbox"/> Wetland is an emergent, estuarine wetland <input type="checkbox"/> Wetland habitat includes salmon rearing pools <input type="checkbox"/> Wetland includes rearing habitat for marine forage fish
	Moderate-High	<input type="checkbox"/> Forest occupies 25-50% of the wetland and peat soils are present
	Moderate	<input type="checkbox"/> Soil is peat, and wetland contains exclusively non-forest vegetation, or <input type="checkbox"/> Soil is non-peat and forest vegetation predominates
	Moderate-Low	<input type="checkbox"/> Soil is non-peat and at least some of the wetland is forest
	Low	<input type="checkbox"/> Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands
Downstream/Coastal Beneficiary Sites	High	<input type="checkbox"/> Downstream structures may be damaged by nontidal overbank flooding (this includes all structures below all nontidal wetlands in the Jordan, Duck, and Mendenhall watersheds, or <input type="checkbox"/> Coastal structures may be damaged by tidal action in the absence of estuarine wetlands, or <input type="checkbox"/> Local residents downslope are served by a community well
		<input type="checkbox"/> Single residences downstream use surface water for drinking, or <input type="checkbox"/> The wetland receives runoff which at expected exposure levels (at the wetland inlet) could occasionally be lethal to aquatic life, and the wetland is not a groundwater recharge area
	Low	<input type="checkbox"/> The wetland rating for this function is neither High nor Moderate

*Restricted access means fish have occasional access but the stream reach or wetland is inaccessible to fish a majority of the time due to tides, low or intermittent flows, waterfalls, dams, or similar obstructions

ATTACHMENT B
WETLANDS FUNCTIONS AND VALUES ASSESSMENTS

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Attachment B-1
Functions and Values Assessments for East Lynn Canal

WETLAND FUNCTIONS AND VALUES																
Sub-Regions	Wetland ID	Field Date	Cowardin Class	Fill Area	Groundwater Recharge	Groundwater Discharge/Flow and Lateral Flow	Surface Hydrologic Control	Sediment/ Toxicant Retention	Nutrient Transformation/ Export	Riparian Support	Fish Habitat	Wildlife	Regional Ecological Diversity	Ecological Replacement	Erosion Sensitivity	Downstream/ Coastal Beneficiary Sites
Sub-Region 1	WETLANDS															
	115-1	aerial	PFO4B	0.76	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low	Low
	125-1	aerial	PFO4B	0.00	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low	Low
	135-1	aerial	PFO4B	0.34	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low	Low
	150-1	aerial	PFO4B	1.41	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low	Low
	165-1	aerial	PFO4B	5.66	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-High	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low	Low
	190-1	aerial	PFO4B	0.40	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-High	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low	Low
	195-1	aerial	PFO4B	0.31	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low	Low
	200-1	aerial	PFO4B	0.22	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low	Low
	235-1	aerial	PFO4B	0.98	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low	Low
	265-1	aerial	PFO4B	0.21	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low	Low
	340-1	7/22/2003	PSS1B/PFO4B	0.73	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Low	Moderate-High	Moderate-High	Low	Low
	330-1	7/22/2003	PFO4B/PSS1B	0.00	High to Moderate	High to Moderate	High	Moderate-Low	Moderate	Moderate-Low	Very Low	Low	Moderate-High	Moderate-High	Moderate-Low	Low
	415-1	7/31/2003	PFO4B	2.12	High to Moderate	High to Moderate	High	Low	Moderate	Moderate-Low	Very Low	Low	Moderate-High	High	Moderate-Low	Low
	800-1	7/28/2003	PFO4B	0.00	High to Moderate	Low	Moderate-High	High	Low	Low	Very Low	Low	Moderate-High	High	Moderate-Low	Low
	800-3	7/28/2003	PFO4B	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low	Low
	830-1	7/28/2003	PFO4B	0.00	High to Moderate	Low	Moderate-High	High	Low	Low	Very Low	Low	Moderate-High	High	Moderate-Low	Low
	735-4	7/28/2003	PFO1A/PSS1A	4.15	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-High	Very Low	Moderate-Low	Moderate-High	High	Low	Low
	680-2	7/28/2003	PFO1A	2.59	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-High	Very Low	Moderate-Low	Moderate-High	High	Low	Low
	735-2	7/28/2003	PEM1S	0.10	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-High	Very Low	High	High	Low	Low	Low
	420-1	7/31/2003	PEM1B/PSS4B	0.72	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Moderate-Low	Moderate	Low	Low
	440-1	7/31/2003	PEM1B/PSS4B	2.06	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Moderate-Low	Moderate	Low	Low
	320-1	7/22/2003	PEM1B/PSS1B	0.00	High to Moderate	High to Moderate	Low	Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	Moderate	Moderate-High	Low
	330-2	7/22/2003	PEM1B/PFO4B	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Low	Moderate-High	Moderate-High	Low	Low
	270-1	aerial	PEM1B	0.01	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Low	Moderate	Low	Low
	275-1	aerial	PEM1B	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Low	Moderate	Low	Low
	800-2	7/28/2003	PEM1B	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Low	Moderate	Low	Low
	800-4	7/28/2003	PEM1B	0.49	High to Moderate	Low	High	High	Low	Low	Very Low	Low	Low	Moderate	Low	Low
	830-2	7/28/2003	PEM1B	0.00	High to Moderate	Low	High	High	Low	Low	Very Low	Low	Low	Moderate	Low	Low
	680-3	aerial	PSS1S/PFL1S	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-High	Very Low	Moderate-Low	Moderate-High	Low	Moderate-High	Low
	690-2	aerial	PSS1R	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-High	Very Low	Moderate-Low	Moderate-High	Low	Moderate-High	Low
	735-1	7/28/2003	E2EM1P	0.00	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	High	Moderate-Low	High	High	High	Low	Low
	MARINE AREAS															
	370-T	7/31/2003	E2RS2N	See Notes	Low	Low	Low	Low	NA	NA	High	High	High	Low	Low	Low

Notes:
E2RS2N, E2US1N, and E2BB1N/P provide minimal hydrologic functions.
Sawmill Cove Ferry Terminal (370-T; E2RS2N): Impacted acreage by Alternatives 2A, 3, 4B and 4D = 1.9 acres; By Alternatives 2, 2B, and 2C = 0.0 acres.
Slate Cove Ferry Terminal (900-T; E2BB1N): Impacted acreage by Alternative 2A = 2.1 acres; By Alternatives 2, 2B, 2C, 3, 4B, and 4D = 0.0 acres.
Slate Cove Ferry Access Road (955-2; PFO4B): Impacted acreage by Alternative 2A = 1.9 acres - total impacts to forested wetland (955-2) by Alternative 2A (with access road) = 31.3 acres; By Alternatives 2, 2B and 2C = 33.8 acres.
Katzehin Ferry Terminal: Impacted acreage by Alternatives 2, 2A, and 2B = 2.2 acres (2765-1; E2RS2N); 2.9 acres (2745-T); and 3.2 acres (2750-1; E2EM1N); By Alternative 2C (no ferry terminal, impacts from road only) = 0.3 acres (2765-1; E2RS2N), 0.6 acres (2750-1; E2RS2N) and 0.6 acres (2750-1; E2EM1N).
July 2003 Station Number+T = ferry terminal location.
See Section 3.0 for a description of Cowardin Classification and the NWI coding system.

Very High, High, or High to Moderate
Moderate-High
Moderate
Moderate-Low
Low or Very Low

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Attachment B-1
Functions and Values Assessments for East Lynn Canal

WETLAND FUNCTIONS AND VALUES																
Sub-Regions	Wetland ID	Field Date	Cowardin Class	Fill Area	Groundwater Recharge	Groundwater Discharge/Flow and Lateral Flow	Surface Hydrologic Control	Sediment/ Toxicant Retention	Nutrient Transformation/ Export	Riparian Support	Fish Habitat	Wildlife	Regional Ecological Diversity	Ecological Replacement	Erosion Sensitivity	Downstream/ Coastal Beneficiary Sites
Sub-Region 2	WETLANDS															
	990-1	aerial	PSS4B/PEM1B	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	High	Moderate-High	Moderate	Low	Low
	1015-1	aerial	PFO4B/PEM1B	0.36	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Low	Low	Moderate-High	Moderate-Low	Low
	1020-1	aerial	PFO4B/PEM1B	0.16	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Low	Low	Moderate-High	Moderate-Low	Low
	895-1	7/31/2003	PFO4B	6.19	High to Moderate	High to Moderate	Low	Low	Moderate	Moderate-High	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low	Low
	910-2	7/30/2003	PFO4B	0.43	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	High	Very Low	Moderate-High	Moderate-High	High	Moderate-Low	Low
	955-2	7/30/2003	PFO4B	See Notes	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	High	High	Very Low	High	Moderate-High	High	Moderate-Low	Low
	920-1	aerial	PEM1B/PSS4B	0.10	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Low	Moderate	Low	Low
	950-1	7/30/2003	PEM1B/PSS4B	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	High	Moderate-High	Moderate	Low	Low
	955-1	7/30/2003	PEM1B/PSS4B	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	High	Moderate-High	Moderate	Low	Low
	975-1	aerial	PEM1B/PSS4B	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Low	Moderate	Low	Low
	1010-1	aerial	PEM1B/PSS4B	0.30	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Low	Moderate	Low	Low
	1040-1	aerial	PEM1B/PSS4B	1.82	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Low	Moderate	Moderate-High	Low
	1185-1	7/30/2003	PFO4B/PSS1B	11.38	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	High	High	Very Low	Moderate-High	Moderate-High	High	Moderate-Low	Low
	1220-1	aerial	PFO4B/PSS1B	1.79	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Moderate-Low	Moderate-High	Low	Low
	1070-1	aerial	PFO4B/PEM1B	1.09	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Moderate-Low	Moderate-High	Low	Low
	1260-1	7/26/2003	PFO4B	1.70	High to Moderate	High to Moderate	Low	Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-Low	High	Moderate-Low	Low
	1275-1	aerial	PFO4B	2.38	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-Low	High	Low	Low
	1110-1	aerial	PEM1B/PSS4B	0.14	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Low	Moderate	Low	Low
	1135-1	aerial	PEM1B/PSS4B	0.24	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Low	Low	Moderate	Low	Low
	1150-1	aerial	PEM1B/PSS4B	0.61	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Low	Moderate	Low	Low
	1260-2	aerial	PEM1B/PSS4B	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Low	Low	Moderate	Moderate-High	Low
	1125-1	aerial	PEM1B	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Low	Low	Moderate	Low	Low
	1185-2	aerial	PEM1B	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Low	Low	Moderate	Low	Low
	900-1	7/30/2003	E2EM1P	0.00	High to Moderate	High to Moderate	Low	Moderate-High	High	High	Moderate-Low	High	High	High	Moderate-Low	Low
	MARINE AREAS															
	900-T	7/30/2003	E2BB1N	See Notes	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	Moderate-High	High	High	High	High	Low	Low

Notes:
E2RS2N, E2US1N, and E2BB1N/P provide minimal hydrologic functions.
Sawmill Cove Ferry Terminal (370-T; E2RS2N): Impacted acreage by Alternatives 2A, 3, 4B and 4D = 1.9 acres; By Alternatives 2, 2B, and 2C = 0.0 acres.
Slate Cove Ferry Terminal (900-T; E2BB1N): Impacted acreage by Alternative 2A = 2.1 acres; By Alternatives 2, 2B, 2C, 3, 4B, and 4D = 0.0 acres.
Slate Cove Ferry Access Road (955-2; PFO4B): Impacted acreage by Alternative 2A = 1.9 acres - total impacts to forested wetland (955-2) by Alternative 2A (with access road) = 31.3 acres; By Alternatives 2, 2B and 2C = 33.8 acres.
Katzehin Ferry Terminal: Impacted acreage by Alternatives 2, 2A, and 2B = 2.2 acres (2765-1; E2RS2N); 2.9 acres (2745-T); and 3.2 acres (2750-1; E2EM1N); By Alternative 2C (no ferry terminal, impacts from road only) = 0.3 acres (2765-1; E2RS2N), 0.6 acres (2750-1; E2RS2N) and 0.6 acres (2750-1; E2EM1N).
July 2003 Station Number+T = ferry terminal location.
See Section 3.0 for a description of Cowardin Classification and the NWI coding system.

Very High, High, or High to Moderate
Moderate-High
Moderate
Moderate-Low
Low or Very Low

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Attachment B-1
Functions and Values Assessments for East Lynn Canal

WETLAND FUNCTIONS AND VALUES																
Sub-Regions	Wetland ID	Field Date	Cowardin Class	Fill Area	Groundwater Recharge	Groundwater Discharge/Flow and Lateral Flow	Surface Hydrologic Control	Sediment/ Toxicant Retention	Nutrient Transformation/ Export	Riparian Support	Fish Habitat	Wildlife	Regional Ecological Diversity	Ecological Replacement	Erosion Sensitivity	Downstream/ Coastal Beneficiary Sites
Sub-Region 3	WETLANDS															
	1360-1	aerial	PFO4B	1.12	High to Moderate	High to Moderate	Low	Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-Low	High	High	Low
	1375-1	aerial	PFO4B	0.07	High to Moderate	High to Moderate	Low	Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-Low	High	High	Low
	2590-1	aerial	E2EM1N	0.79	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	High	High	High	High	High	Low	Low
	MARINE AREAS															
	1300-1	aerial	E2RS2N/E2US1N	0.00	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low	Low
	1380-1	aerial	E2RS2N/E2US1N	0.57	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low	Low
Sub-Region 4	1480-1	aerial	E2RS2N	18.67	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low	Low
	WETLANDS															
	3565-1	aerial	PSS4B	0.00	High to Moderate	Low	High	High	Low	Low	Very Low	Low	Low	Moderate	Low	Low
	3560-1	aerial	PEM1B	0.00	High to Moderate	Low	High	High	Low	Low	Very Low	Low	Low	Moderate	Low	Low
	2670-1	aerial	E2EM1P	0.00	High to Moderate	High to Moderate	Low	Moderate-High	High	High	Moderate-Low	High	High	High	Low	Low
	2690-1	aerial	E2EM1P	0.44	High to Moderate	High to Moderate	Low	Moderate-High	High	High	Moderate-Low	High	High	High	Low	Low
	2630-1	7/27/2003	E2EM1N	0.21	High to Moderate	High to Moderate	Low	Moderate-High	High	High	High	High	High	High	Low	Low
	2735-1	7/27/2003	E2EM1N	0.91	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	High	High	High	High	High	Low	Low
	2750-1	aerial	E2EM1N	See Notes	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	High	High	High	High	High	Low	Low
	MARINE AREAS															
	2745-T	aerial	E2RS2N	See Notes	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low	Low
	2765-1	aerial	E2RS2N	See Notes	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low	Low
	2800-1	aerial	E2RS2N	0.01	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low	Low
	2985-1	aerial	E2RS2N	0.00	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low	Low
	3000-1	aerial	E2RS2N	0.19	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low	Low
	3300-1	aerial	E2RS2N	0.35	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low	Low
	3580-1	aerial	E2RS2N	0.00	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low	High
	2735-2	7/27/2003	E2BB1P	1.33	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	Moderate-High	Moderate-Low	High	High	Low	Low	Low
	AQUATIC BEDS (VEGETATED SHALLOWS)/ OPEN WATER															
	3615-1	7/27/2003	POWH	0.00	High to Moderate	High to Moderate	Low	Moderate-High	High	Moderate-High	Moderate-Low	High	Moderate-Low	Low	Low	High
	3615-2	7/27/2003	POWH	0.00	Low	High to Moderate	Low	Moderate-High	High	Moderate-High	Moderate-High	Low	Low	Low	Low	Low
	3615-3	aerial	POWH	0.00	Low	High to Moderate	Low	Moderate-High	High	Moderate-High	Moderate-High	Low	Low	Low	Low	Low

Notes:
E2RS2N, E2US1N, and E2BB1N/P provide minimal hydrologic functions.
Sawmill Cove Ferry Terminal (370-T; E2RS2N): Impacted acreage by Alternatives 2A, 3, 4B and 4D = 1.9 acres; By Alternatives 2, 2B, and 2C = 0.0 acres.
Slate Cove Ferry Terminal (900-T; E2BB1N): Impacted acreage by Alternative 2A = 2.1 acres; By Alternatives 2, 2B, 2C, 3, 4B, and 4D = 0.0 acres.
Slate Cove Ferry Access Road (955-2; PFO4B): Impacted acreage by Alternative 2A = 1.9 acres - total impacts to forested wetland (955-2) by Alternative 2A (with access road) = 31.3 acres; By Alternatives 2, 2B and 2C = 33.8 acres.
Katzehin Ferry Terminal: Impacted acreage by Alternatives 2, 2A, and 2B = 2.2 acres (2765-1; E2RS2N); 2.9 acres (2745-T); and 3.2 acres (2750-1; E2EM1N); By Alternative 2C (no ferry terminal, impacts from road only) = 0.3 acres (2765-1; E2RS2N), 0.6 acres (2750-1; E2RS2N) and 0.6 acres (2750-1; E2EM1N).
July 2003 Station Number+T = ferry terminal location.
See Section 3.0 for a description of Cowardin Classification and the NWI coding system.

Very High, High, or High to Moderate

Moderate-High

Moderate

Moderate-Low

Low or Very Low

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Attachment B-2
Functions and Values Assessments for West Lynn Canal

WETLAND FUNCTIONS AND VALUES																
Sub-Regions	Wetland ID	Field Date	Cowardin Code	Fill Area	Groundwater Recharge	Groundwater Discharge/Flow and Lateral Flow	Surface Hydrologic Control	Sediment/ Toxicant Retention	Nutrient Tranformation/ Export	Riparian Support	Fish Habitat	Wildlife	Regional Ecological Diversity	Ecological Replacement	Erosion Sensitivity	Downstream/ Coastal Beneficiary Sites
Sub-Region 1	WETLANDS															
	4880-1	7/23/2003	PFO4B	5.33	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	High	Moderate-High	Very Low	High	Moderate-High	High	Low	Low
	4040-2	7/24/2003	PFO4B	1.49	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low	Low
	4410-1	7/23/2003	PFO4B	2.88	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-High	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low	Low
	4940-1	aerial	PFO4B	3.97	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low	Low
	4940-2	aerial	PFO4B	5.04	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	High	Very Low	Moderate-Low	Moderate-High	High	Moderate-Low	Low
	4040-1	7/24/2003	PEM1B/PSS1B	0.00	High to Moderate	High to Moderate	High	High	Low	Low	Very Low	Low	Moderate-High	Moderate	Moderate-High	Low
	4880-5	aerial	PEM1B/PSS1B	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	High	Moderate-High	Very Low	High	Moderate-High	Moderate	Low	Low
	4135-1	aerial	PEM1B	1.85	High to Moderate	High to Moderate	High	High	Low	Low	Very Low	Moderate-Low	Low	Moderate	Moderate-High	Low
	4770-1	7/23/2003	PEM1B	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	High	Moderate-High	Low	High	High	Moderate	Low	Low
	4770-2	7/23/2003	PEM1B	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	High	Moderate-High	Low	High	High	Moderate	Low	Low
	4880-3	aerial	PEM1B	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	High	Moderate-High	Moderate	Low	Low
	4880-4	aerial	PEM1B	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Moderate-Low	Moderate	Low	Low
	5485-1	7/25/2003	E2FL1P	0.00	Low	Low	Low	Moderate-High	Moderate	Moderate-High	Moderate-Low	High	High	Low	Low	Low
	4620-1	aerial	E2EM1P	0.21	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	High	Moderate-Low	High	High	High	Low	Low
	4900-1	7/24/2003	E2EM1P	0.17	High to Moderate	High to Moderate	Low	Moderate-High	High	High	Moderate-Low	High	High	High	Moderate-High	Low
	4570-1	aerial	E2EM1N	0.00	High to Moderate	High to Moderate	Low	Moderate-High	High	High	Moderate-Low	High	High	High	Moderate-High	Low
	4570-2	aerial	E2EM1N	0.00	High to Moderate	High to Moderate	Low	Moderate-High	High	High	Moderate-Low	High	High	High	Moderate-High	Low
	MARINE AREAS															
	4030-T	7/24/2003	E2RS2N	4.60	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low	Low
	4150-1	aerial	E2RS2N	0.00	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low	Low
	4450-1	aerial	E2RS2N	0.00	Low	Low	Low	Low	NA	NA	High	Moderate-Low	High	Low	Low	Low
	4570-3	aerial	E2BB1N	0.09	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	Moderate-High	Moderate-Low	High	High	Low	Low	Low
	4570-4	aerial	E2BB1N	0.00	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	Moderate-High	Moderate-Low	High	High	Low	Low	Low
Sub-Region 2	WETLANDS															
	5645-1	aerial	PFO5Fb	1.12	High to Moderate	High to Moderate	Moderate-Low	Moderate-High	Moderate	Moderate-Low	Very Low	High	Moderate-High	Moderate	Low	Low
	5610-1	7/24/2003	PEM5C/POWH	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	High	High	Low	Low	Low
	5610-2	7/24/2003	PEM5C/POWH	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Moderate-Low	Low	Low	Low
	5565-1	7/25/2003	PEM5C/PAB4H	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	High	Low	Low	Low
	5565-2	7/25/2003	PEM5C/PAB4H	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	High	Low	Low	Low
	5610-3	7/24/2003	PEM5C/PAB4H	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	High	Low	Low	Low
	5610-4	7/29/2003	PEM5C/PAB4H	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	High	High	Low	Low	Low
	5615-1	7/29/2003	PEM5C/PAB4H	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	High	High	Low	Low	Low
	5640-1	7/26/2003	PEM5C/PAB4H	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	High	Low	Low	Low
	5655-1	7/26/2003	PEM5C	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Low	Moderate	Low	Low
	5660-2	7/26/2003	PEM5C	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Low	Low	Low	Low
	5600-1	7/25/2003	PEM5B	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-High	Very Low	Moderate-Low	Low	Low	Low	Low
	5595-1	7/25/2003	PEM1C/POWH	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	High	Low	Low	Low
	5660-1	7/26/2003	PEM1C	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Low	Moderate	Low	Low
	5560-1	aerial	PEM1B	0.05	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Low	Low	Low	Low

Notes:
E2RS2N, E2US1N, and E2BB1N/P provide minimal hydrologic functions.
William Henry Bay Ferry Terminal (4030-T; E2RS2N): Impacted acreage by Alternative 3 = 4.6 acres; By Alternatives 2, 2A, 2B, 2C, 4B & 4D = 0.0 acres.
July 2003 Station Number+T = ferry terminal location.
See Section 3.0 for a description of Cowardin Classification and the NWI coding system.

Very High, High, or High to Moderate
Moderate-High
Moderate
Moderate-Low
Low or Very Low

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Attachment B-2
Functions and Values Assessments for West Lynn Canal

WETLAND FUNCTIONS AND VALUES																
Sub-Regions	Wetland ID	Field Date	Cowardin Code	Fill Area	Groundwater Recharge	Groundwater Discharge/Flow and Lateral Flow	Surface Hydrologic Control	Sediment/ Toxicant Retention	Nutrient Tranformation/ Export	Riparian Support	Fish Habitat	Wildlife	Regional Ecological Diversity	Ecological Replacement	Erosion Sensitivity	Downstream/ Coastal Beneficiary Sites
Sub-Region 2	WETLANDS															
	5570-2	aerial	PEM1B	0.35	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Low	Low	Low	Low
	5575-1	7/25/2003	PEM1B	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	High	Low	Low	Low
	5580-1	aerial	PEM1B	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Low	Low	Low	Low
	5595-2	aerial	PEM1B	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-Low	Low	Low	Low	Low
	AQUATIC BEDS (VEGETATED SHALLOWS)/OPEN WATER															
	5625-1	7/29/2003	PAB4H/POWH	0.00	Low	High to Moderate	Moderate-Low	Moderate-High	High	Moderate-Low	Moderate-Low	High	High	Low	Low	Low
	5565-4	7/25/2003	PAB4H/PEM5C	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	High	Low	Low	Low
	5620-1	7/29/2003	PAB4H/PEM5C	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	High	Low	Low	Low
	5620-2	7/29/2003	PAB4H/PEM5C	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	High	Low	Low	Low
	5565-3	7/25/2003	PAB4H	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	High	Low	Low	Low
	5570-1	aerial	PAB4H	0.00	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	High	Low	Low	Low
	5580-2	aerial	PAB4H	0.17	Low	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	High	Low	Low	Low
	5590-1	7/25/2003	POWH	0.00	Low	High to Moderate	Moderate-Low	Moderate-High	High	Moderate-Low	Moderate-Low	Moderate-High	High	Low	Low	Low
	5640-2	7/26/2003	POWH	0.00	Low	High to Moderate	Moderate-Low	Moderate-High	High	Moderate-Low	Moderate-Low	Moderate-High	Moderate-High	Low	Low	Low
Sub-Region 3	WETLANDS															
	5660-3	7/26/2003	PEM1C	0.00	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Moderate-High	Low	Low	Low	Low
	5670-1	aerial	PFO4B	0.93	High to Moderate	High to Moderate	Moderate-Low	Moderate-Low	Moderate	Moderate-Low	Very Low	Low	Moderate-High	High	Moderate-Low	Low
	5980-1	7/26/2003	E2EM1N	1.11	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	High	High	High	High	High	Low	Low
	MARINE AREAS															
	5870-1	aerial	E2BB1P	0.00	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	Moderate-High	Moderate-Low	High	High	Low	Low	Low
	5940-1	aerial	E2BB1N	0.00	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	Moderate-High	Moderate-Low	High	High	Low	Low	Low
	6040-1	aerial	E2BB1N	4.80	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	Moderate-High	Moderate-Low	High	High	Low	Low	Low
	6090-1	7/27/2003	E2BB1N	0.00	High to Moderate	High to Moderate	Low	Moderate-High	Moderate	Moderate-High	Moderate-Low	High	High	Low	Low	High

Notes:
E2RS2N, E2US1N, and E2BB1N/P provide minimal hydrologic functions.
William Henry Bay Ferry Terminal (4030-T; E2RS2N): Impacted acreage by Alternative 3 = 4.6 acres; By Alternatives 2, 2A, 2B, 2C, 4B & 4D = 0.0 acres.
July 2003 Station Number+T = ferry terminal location.
See Section 3.0 for a description of Cowardin Classification and the NWI coding system.

Very High, High, or High to Moderate

Moderate-High

Moderate

Moderate-Low

Low or Very Low

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ATTACHMENT C
FIELD NOTES AND SITE PHOTOS

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Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/22/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 320+00 Plot ID: 320-1 Cowardin Class: PEM1B/PSS1B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Tsuga heterophylla</u>	<u>FAC</u>	<u>5</u>	<u> </u>
2 <u>Tsuga mertensia</u>	<u>FAC</u>	<u>5</u>	<u> </u>
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Viburnum edule</u>	<u>FACU</u>	<u>1</u>	<u> </u>
2 <u>Alnus tenuifolia</u>	<u>FAC</u>	<u>5</u>	<u> </u>
3 <u>Ledum groenlandicum</u>	<u>FACW</u>	<u>3</u>	<u> </u>
4 <u>Malus fusca</u>	<u>FACW</u>	<u>5</u>	<u> </u>
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Lysichiton americanus</u>	<u>OBL</u>	<u>10</u>	<u> </u>
2 <u>Rubus chamaemorus</u>	<u>FACW</u>	<u>10</u>	<u> </u>
3 <u>Eleocharis palustris</u>	<u>OBL</u>	<u>95</u>	<u>1</u>
4 <u>Fauria crista-galli</u>	<u>FACW</u>	<u>5</u>	<u> </u>
5 _____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

X Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): Kogish peat Drainage Class: Very poorly drained

Field Observations

Taxonomy (Subgroup): Cryic Sphagnofibris Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
3-0	NA	NA	NA	NA	Sphagnum layer
0-16	O	5YR3/3	NA	NA	fibrous peat

Hydric Soil Indicators:

<u>X</u> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes
Wetland Hydrology Present?	Yes
Hydric Soils Present?	Yes
Is this Sampling Point Within a Wetland?	Yes

Vegetation Photo #: No photo Looking: _____

Soil Photo #: No photo

(optional) Photo# _____: Explain: _____

Remarks:

GPS data points 15, 16 and 17

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/22/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 330+00 Plot ID: 330-1 Cowardin Class: PFO4B/PSS1B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Tsuga mertensiana</u>	<u>FAC</u>	<u>15</u>		<u>2</u>
2 <u>Pinus contorta var. contorta</u>	<u>FACW</u>	<u>10</u>		<u>3</u>
3 _____				
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Ledum groenlandicum</u>	<u>FACW</u>	<u>25</u>		<u>1</u>
2 <u>Menziesia ferruginea</u>	<u>FACU</u>	<u>5</u>		
3 <u>Kalmia polifolia</u>	<u>FACW</u>	<u>5</u>		
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Rubus chaememorous</u>	<u>FACW</u>	<u>10</u>		<u>4</u>
2 <u>Drosera rotundifolia</u>	<u>OBL</u>	<u>5</u>		
3 <u>Vaccinium oxycoccus</u>	<u>OBL</u>	<u>5</u>		
4 _____				
5 _____				

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation.

HYDROLOGY

___ Recorded Data (Describe in Remarks):

- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

☒ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

- ☒ Saturated in Upper 12 Inches
- ___ Inundated
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): Kogist Peat Drainage Class: Very poorly drained

Field Observations

Taxonomy (Subgroup): Crylic Sphagnofibrust Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
4-0	NA	NA	NA	NA	Sphagnum layer
0-16	O	7.5YR5/2	NA	NA	fibrous

Hydric Soil Indicators:

- ☒ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- ___ Gleyed or Low-Chroma Colors
- ___ Concretions
- ___ High Organic Content in Surface Layer in Sandy Soils
- ___ Organic Streaking in Sandy Soils
- ___ Listed on Local Hydric Soils List
- ___ Listed on National Hydric Soils List
- ___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: No photo Looking: _____

Soil Photo #: No photo

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 11

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

X Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): Kogish Peat Drainage Class: Very poorly drained

Field Observations

Taxonomy (Subgroup): Cryic Sphagnofibris Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
2-0	NA	NA	NA	NA	Sphagnum layer
0-16	O	5YR3/3	NA	NA	fibrous, peat

Hydric Soil Indicators:

<u>X</u> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: No photo Looking: _____

Soil Photo #: No photo

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 12

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/22/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 340+00 Plot ID: 340-1 Cowardin Class: PSS1B/PFO4B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Tsuga mertensiana</u>	<u>FAC</u>	<u>15</u>	<u>3</u>
2 <u>Pinus contorta var. contorta</u>	<u>FACW</u>	<u>2</u>	
3 _____			
4 _____			
5 _____			

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Ledum groenlandicum</u>	<u>FACW</u>	<u>40</u>	<u>1</u>
2 <u>Menziesia ferruginea</u>	<u>FACU</u>	<u>5</u>	
3 _____			
4 _____			
5 _____			

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Empetrum nigrum subsp. nigrum</u>	<u>FAC</u>	<u>30</u>	<u>2</u>
2 <u>Rubus chamaemorus</u>	<u>FACW</u>	<u>5</u>	
3 <u>Vaccinium uliginosum</u>	<u>FAC</u>	<u>5</u>	
4 <u>Eriophorum gracile</u>	<u>OBL</u>	<u>5</u>	
5 _____			

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation.

HYDROLOGY

___ Recorded Data (Describe in Remarks):

___ Stream, Lake, or Tide Gauge

___ Aerial Photographs

___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)

Depth to Free Water in Pit: NA (in.)

Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

X Saturated in Upper 12 Inches

___ Inundated

___ Water Marks

___ Drift Lines

___ Sediment Deposits

___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches

___ Water-Stained Leaves

___ Local Soil Survey Data

___ Local Soil Survey Data

___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): Kogish peat Drainage Class: Very poorly drained

Field Observations

Taxonomy (Subgroup): Cyric Sphagnofibrust Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
3-0	NA	NA	NA	NA	Sphagnum layer
0-16	O	5YR3/3	NA	NA	fibrous, peat

Hydric Soil Indicators:

X Histosol

___ Histic Epipedon

___ Sulfidic Odor

___ Aquic Moisture Regime

___ Reducing Conditions

___ Gleyed or Low-Chroma Colors

___ Concretions

___ High Organic Content in Surface Layer in Sandy Soils

___ Organic Streaking in Sandy Soils

___ Listed on Local Hydric Soils List

___ Listed on National Hydric Soils List

___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes

Wetland Hydrology Present? Yes

Hydric Soils Present? Yes

Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: No photo Looking: _____

Soil Photo #: No photo

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 13 and 14

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/31/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 415+00 Plot ID: 415-1 Cowardin Class: PFO4B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Tsuga heterophylla</u>	<u>FAC</u>	<u>60</u>	<u>1</u>
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Vaccinium ovaefolium</u>	<u>FAC</u>	<u>50</u>	<u>2</u>
2 <u>Oplapanax horridus</u>	<u>FAC</u>	<u>20</u>	<u>4</u>
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Lysichiton americanus</u>	<u>OBL</u>	<u>20</u>	<u>5</u>
2 <u>Maianthemum dilatatum</u>	<u>FAC</u>	<u>30</u>	<u>3</u>
3 <u>Coptis asplenifolia</u>	<u>FAC</u>	<u>10</u>	_____
4 <u>Gymnocarpium dryopteris</u>	<u>FACU</u>	<u>5</u>	_____
5 <u>Cornus canadensis</u>	<u>FACU</u>	<u>10</u>	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:Primary Indicators:

☒ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name _____

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations _____

Taxonomy (Subgroup): Typic cryohemist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
1-0	NA	NA	NA	NA	rooted organic
0-16	O	10YR2/1	NA	NA	very fine organic

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 415-1-veg Looking: _____

Soil Photo #: 415-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

New point 26



Needleleaf forested wetland vegetation at site 415-1



Hydric soil at site 415-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/31/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 420+00 Plot ID: 420-1 Cowardin Class: PEM1B/PSS4B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Tsuga mertensia</u>	<u>FAC</u>	<u>10</u>	
2 _____			
3 _____			
4 _____			
5 _____			

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Kalmia polifolia</u>	<u>FACW</u>	<u>40</u>	<u>2</u>
2 <u>Ledum groenlandicum</u>	<u>FACW</u>	<u>20</u>	<u>4</u>
3 _____			
4 _____			
5 _____			

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Lysichiton americanus</u>	<u>OBL</u>	<u>5</u>	
2 <u>Rubus chamaemorus</u>	<u>FACW</u>	<u>30</u>	<u>3</u>
3 <u>Drosera rotundifolia</u>	<u>OBL</u>	<u>5</u>	
4 <u>Empetrum nigrum ssp. nigrum</u>	<u>FAC</u>	<u>20</u>	<u>5</u>
5 <u>Carex flava</u>	<u>OBL</u>	<u>60</u>	<u>1</u>

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-6 (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:Primary Indicators:

X Saturated in Upper 12 Inches
X Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name _____

(Series and Phase): _____ Drainage Class: Very poorly drained

Field Observations _____

Taxonomy (Subgroup): Typic sphagnofibrist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
0-9	OA	10YR4/6	NA	NA	fibrous peat
9-16	OB	10YR3/4	NA	NA	fibrous peat

Hydric Soil Indicators:

<u>X</u> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 420-1-veg Looking: _____

Soil Photo #: 420-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

New point 25



Emergent and scrub-shrub wetland vegetation at site 420-1



Hydric peat soils at site 420-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/31/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 440+00 Plot ID: 440-1 Cowardin Class: PEM1B/PSS4B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Kalmia polifolia</u>	<u>FACW</u>	<u>10</u>	_____
2 <u>Ledum groenlandicum</u>	<u>FACW</u>	<u>10</u>	_____
3 <u>Alnus viridis ssp. sinuata</u>	<u>FAC</u>	<u>5</u>	_____
4 <u>Tsuga mertensiana</u>	<u>FAC</u>	<u>20</u>	<u>4</u>
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Lysichiton americanus</u>	<u>OBL</u>	<u>5</u>	_____
2 <u>Fauria crista-galli</u>	<u>OBL</u>	<u>20</u>	<u>2</u>
3 <u>Carex flava</u>	<u>OBL</u>	<u>60</u>	<u>1</u>
4 <u>Carex sitchensis</u>	<u>OBL</u>	<u>20</u>	<u>3</u>
5 <u>Cornus canadensis</u>	<u>FACU</u>	<u>5</u>	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-6 (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:Primary Indicators:

☒ Saturated in Upper 12 Inches
☒ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name _____

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations _____

Taxonomy (Subgroup): Typic sphagnofibris Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
<u>1-0</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>live sphagnum</u>
<u>0-16</u>	<u>O</u>	<u>10YR4/6</u>	<u>NA</u>	<u>NA</u>	<u>peat</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 440-1-veg Looking: _____

Soil Photo #: 440-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

New point 27



Emergent and scrub-shrub vegetation at site 440-1



Hydric peat soils at site 440-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/31/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: Sawmill Cove Ferry Plot ID: Sawmill Ferry Cove Cowardin Class: E2RS2N

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Leymus arenarius</u>	<u>FACU</u>	<u>70</u>	<u>1</u>
2 <u>Ligusticum scoticum</u>	<u>FAC</u>	<u>10</u>	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): Tidal sediments Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
0+	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>cobble/gravel</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: photos 41-46 Looking: _____

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:

New line 29



Estuarine rocky shores at Sawmill Cove ferry terminal site



Estuarine rocky shores at Sawmill Cove ferry terminal site



Estuarine rocky shores at Sawmill Cove ferry terminal



Estuarine rocky shores at Sawmill Cove ferry terminal



Looking west at the Sawmill Cove ferry terminal site

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: aerial photography Weather Conditions: _____

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 600+00 Plot ID: 600-1 Cowardin Class: R3OWH

Do Normal Circumstances exist on the site? Yes No

Is the site significantly disturbed (Atypical Situation)? Yes No

Is the area a potential Problem Area? Yes No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: _____ Other indicators: _____

Hydrophytic vegetation?: Yes _____ No _____ Basis: _____

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:**Primary Indicators:**

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No (Circle)
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this Sampling Point Within a Wetland?	Yes	No

Vegetation Photo #: _____ Looking: _____

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:

Digitized off aerial photography

Steep cliffs, photos



Stream at Station 600+00



Stream at Station 600+00



Stream at Station 600+00



Head of stream at Station 600+00



Steep cliffs paralleling stream at 600+00



Steep cliffs paralleling stream at 600+00

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/28/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 680+00 Plot ID: 680-1 Cowardin Class: PSS1A/PFL2A

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Populus balsamifera</u>	<u>FAC</u>	<u>20</u>		<u>2</u>
2 _____				
3 _____				
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Alnus viridis ssp. sinuata</u>	<u>FAC</u>	<u>40</u>		<u>1</u>
2 <u>Salix sitchensis</u>	<u>FAC</u>	<u>1</u>		
3 _____				
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Leymus arenarius</u>	<u>FACU</u>	<u>10</u>		
2 _____				
3 _____				
4 _____				
5 _____				

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): Upland soil Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
1-0	NA	NA	NA	NA	rooted organic
0-2	A	10YR5/3	NA	NA	sand w/ organics
2-16	B	10YR6/1	NA	NA	sand

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: 680-1-veg Looking: _____

Soil Photo #: 680-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS pt 109



Scrub-shrub and river flats vegetation at site 680-1



Upland soils at site 680-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/28/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 680+00 Plot ID: 680-2 Cowardin Class: PFO1A

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Populus balsamifera</u>	<u>FAC</u>	<u>40</u>		<u>1</u>
2 <u>Alnus viridis ssp. sinuata</u>	<u>FAC</u>	<u>30</u>		<u>2</u>
3 _____				
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Oplapanax horridus</u>	<u>FAC</u>	<u>10</u>		
2 <u>Rubus spectabilis</u>	<u>FACU</u>	<u>5</u>		
3 <u>Viburnum edule</u>	<u>FACU</u>	<u>15</u>		
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Maianthemum dilatatum</u>	<u>FAC</u>	<u>30</u>		<u>3</u>
2 <u>Athyrium filix-femina</u>	<u>FAC</u>	<u>30</u>		<u>4</u>
3 _____				
4 _____				
5 _____				

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA(in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:**Primary Indicators:**

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
☒ Drainage Patterns in Wetlands: river terrace, parallel to Berners River

Secondary Indicators (2 or more required):

☒ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Floodplain soils Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
0-3	O	5YR3/1	NA	NA	organic
3-7	A	10YR4/2	NA	NA	silty sand
7-16	B	10YR4/2	10YR4/4	many/medium/fine	sand

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	<input checked="" type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
<input checked="" type="checkbox"/> Reducing Conditions	___ Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 680-2-veg Looking: _____

Soil Photo #: 680-2-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS pt 110



Broadleaf forested wetland undergrowth vegetation at site 680-2



Hydric soils at site 680-2

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/28/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 705+00 Plot ID: 705-1 Cowardin Class: closed mixed forest

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Picea sitchensis</u>	<u>FACU</u>	<u>40</u>		<u>2</u>
2 <u>Alnus viridis ssp. sinuata</u>	<u>FAC</u>	<u>5</u>		
3 <u>Populus balsamifera</u>	<u>FACU</u>	<u>60</u>		<u>1</u>
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Viburnum edule</u>	<u>FACU</u>	<u>5</u>		
2 <u>Oplapanax horridus</u>	<u>FAC</u>	<u>5</u>		
3 _____				
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Pyrola minor</u>	<u>FAC</u>	<u>15</u>		
2 _____				
3 _____				
4 _____				
5 _____				

% of species that are OBL, FACW, and/or FAC: 0% Other indicators: _____

Hydrophytic vegetation?: No Basis: 0% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA(in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:**Primary Indicators:**

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: swales, river terrace

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): Upland soil Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
1-0	NA	NA	NA	NA	rooted organic
0-1	OA	5YR3/2	NA	NA	organics
1-16	A	10YR5/2	NA	NA	gravelly sand

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? No
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: 705-1-veg Looking: _____

Soil Photo #: 705-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

No GPS point



Mixed forest vegetation at site 705-1



Upland soils at site 705-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/28/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 735+00 Plot ID: 735-1 Cowardin Class: E2EM1P

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Iris setosa</u>	<u>FAC</u>	<u>80</u>	_____	<u>1</u>
2 <u>Sanguisorba canadensis</u>	<u>FACW</u>	<u>10</u>	_____	_____
3 <u>Streptopus amplexifolius</u>	<u>FAC</u>	<u>5</u>	_____	_____
4 <u>Lupinus nootkatensis</u>	<u>FAC</u>	<u>15</u>	_____	_____
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Typic cryaqueant Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
1-0	NA	NA	NA	NA	rooted organic
0-3	O	10YR4/2	NA	NA	silt w/ organics
3-9	A	10YR4/3	NA	NA	silt
9-16	B	10YR4/1	10YR4/3	few/large/distinct	silt
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? No
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: 735-1-veg Looking: _____

Soil Photo #: 735-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS line 113 and point 114 influenced by river/tidal flooding, dry estuary



Tidally influenced emergent wetland vegetation at site 735-1



Mottled hydric soil at site 735-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/28/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 735+00 Plot ID: 735-2 Cowardin Class: PEM1S

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Epilobium angustifolium</u>	<u>FACU</u>	<u>90</u>	_____	<u>1</u>
2 <u>Calamagrostis canadensis</u>	<u>FAC</u>	<u>30</u>	_____	<u>2</u>
3 <u>Heracleum maximum</u>	<u>FACU</u>	<u>2</u>	_____	_____
4 <u>Lupinus nootkatensis</u>	<u>FAC</u>	<u>5</u>	_____	_____
5 <u>Equisetum arvense</u>	<u>FAC</u>	<u>5</u>	_____	_____

% of species that are OBL, FACW, and/or FAC: 50% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 50% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
☒ Drainage Patterns in Wetlands: swales, river terrace

Secondary Indicators (2 or more required):

☒ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Typic cryaqueant Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
2-0	NA	NA	NA	NA	rooted organic
0-3	OA	10YR4/2	NA	NA	silt w/ organics
3-5	A	10YR5/2	NA	NA	fine sand
5-16	B	10YR4/2	10YR5/4	few/medium/distinct	silty sand

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
<input checked="" type="checkbox"/> Reducing Conditions	___ Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 735-2-veg Looking: _____

Soil Photo #: 735-2-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS pt 115 _____



Tidally influenced emergent wetland vegetation at site 735-2



Mottled hydric soils at site 735-2

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/28/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 735+00 Plot ID: 735-3 Cowardin Class: open needleleaf forest
Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Picea sitchensis</u>	<u>FACU</u>	<u>40</u>		<u>2</u>
2 <u>Populus balsamifera</u>	<u>FACU</u>	<u>5</u>		
3 _____				
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Viburnum edule</u>	<u>FACU</u>	<u>30</u>		<u>3</u>
2 <u>Oplapanax horridus</u>	<u>FAC</u>	<u>5</u>		
3 <u>Alnus viridis ssp. crispa</u>	<u>FAC</u>	<u>5</u>		
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Maianthemum dilatatum</u>	<u>FAC</u>	<u>70</u>		<u>1</u>
2 _____				
3 _____				
4 _____				
5 _____				

% of species that are OBL, FACW, and/or FAC: 23% Other indicators: _____

Hydrophytic vegetation?: No Basis: 23% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA(in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: swales, river terrace

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): Upland soil Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
2-0	NA	NA	NA	NA	rooted organic
0-3.5	A	10YR5/2	NA	NA	sand
3.5-16	B	10YR5/3	NA	NA	fine sand

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? No
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: no photo Looking: _____

Soil Photo #: no photo

(optional) Photo# _____: Explain: _____

Remarks:

GPS 116

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/28/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 735+00 Plot ID: 735-4 Cowardin Class: PFO1A/PSS1A

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Populus balsamifera</u>	<u>FAC</u>	<u>30</u>		<u>2</u>
2 <u>Alnus viridis ssp. crispa</u>	<u>FAC</u>	<u>10</u>		
3 _____				
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Oplapanax horridus</u>	<u>FAC</u>	<u>25</u>		<u>3</u>
2 <u>Actaea rubra</u>	<u>FAC</u>	<u>5</u>		
3 _____				
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Maianthemum dilatatum</u>	<u>FAC</u>	<u>60</u>		<u>1</u>
2 _____				
3 _____				
4 _____				
5 _____				

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:**Primary Indicators:**

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
☒ Drainage Patterns in Wetlands: river terrace

Secondary Indicators (2 or more required):

☒ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Floodplain soil Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
2-0	NA	NA	NA	NA	rooted organic
0-4	O	5YR2.5/2	NA	NA	silt w/ organics
4-16	A	10YR5/1	10YR5/3	many/fine/fine	fine sand

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
<input checked="" type="checkbox"/> Reducing Conditions	___ Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 735-4-veg Looking: _____

Soil Photo #: 735-4-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS pt 117



Deciduous forested wetland vegetation at site 735-4



Hydric soil at site 735-4

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/28/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 800+00 Plot ID: 800-1 Cowardin Class: PFO4B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Tsuga heterophylla</u>	<u>FAC</u>	<u>20</u>		<u>3</u>
2 <u>Picea sitchensis</u>	<u>FACU</u>	<u>1</u>		
3 <u>Tsuga mertensia</u>	<u>FAC</u>	<u>5</u>		
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Vaccinium ovalifolium</u>	<u>FAC</u>	<u>80</u>		<u>1</u>
2 <u>Menziesia ferruginea</u>	<u>FACU</u>	<u>30</u>		<u>2</u>
3 _____				
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Cornus canadensis</u>	<u>FACU</u>	<u>15</u>		
2 <u>Coptis asplenifolia</u>	<u>FAC</u>	<u>20</u>		<u>4</u>
3 _____				
4 _____				
5 _____				

% of species that are OBL, FACW, and/or FAC: 75% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 75% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 2 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Typic cryosaprist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
1-0	NA	NA	NA	NA	rooted organic
0-8	OA	5YR2.5/2	NA	NA	fibrous organic
8-16	OB	5YR2.5/2	NA	NA	very fine organic

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: no photo Looking: _____

Soil Photo #: no photo

(optional) Photo# _____: Explain: _____

Remarks:

GPS pt 118

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/28/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 800+00 Plot ID: 800-2 Cowardin Class: PEM1B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Pinus contorta var. contorta</u>	<u>FACW</u>	<u>15</u>		
2 _____				
3 _____				
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Ledum groenlandicum</u>	<u>FACW</u>	<u>20</u>		<u>3</u>
2 <u>Kalmia polifolia</u>	<u>FACW</u>	<u>20</u>		<u>4</u>
3 _____				
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Rubus chamaemorus</u>	<u>FACW</u>	<u>10</u>		
2 <u>Cornus canadensis</u>	<u>FACU</u>	<u>10</u>		
3 <u>Carex saxatilis</u>	<u>FACW</u>	<u>30</u>		<u>1</u>
4 <u>Empetrum nigrum ssp. nigrum</u>	<u>FAC</u>	<u>10</u>		
5 <u>Drosera rotundifolia</u>	<u>OBL</u>	<u>30</u>		<u>2</u>

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-12 (in.)
Depth to Free Water in Pit: 12 (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
☒ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): Kogish Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Typic sphagnofibrist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
<u>3-0</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>sphagnum</u>
<u>0-16</u>	<u>O</u>	<u>5YR5/4</u>	<u>NA</u>	<u>NA</u>	<u>sphagnum peat</u>

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: no photo Looking: _____

Soil Photo #: no photo

(optional) Photo# _____: Explain: _____

Remarks:

GPS pt 119

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/28/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 800+00 Plot ID: 800-3 Cowardin Class: PFO4B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Alnus viridis ssp. crispa</u>	<u>FAC</u>	<u>20</u>		<u>1</u>
2 <u>Tsuga heterophylla</u>	<u>FAC</u>	<u>20</u>		<u>2</u>
3 <u>Pinus contorta var. contorta</u>	<u>FACW</u>	<u>20</u>		<u>3</u>
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Viburnum edule</u>	<u>FACU</u>	<u>2</u>		
2 <u>Menziesia ferruginea</u>	<u>FACU</u>	<u>10</u>		
3 <u>Vaccinium ovalifolium</u>	<u>FAC</u>	<u>20</u>		<u>4</u>
4 <u>Oplapanax horridus</u>	<u>FAC</u>	<u>10</u>		
5 <u>Rubus spectabilis</u>	<u>FACU</u>	<u>5</u>		

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Lysichiton americanus</u>	<u>OBL</u>	<u>5</u>		
2 <u>Coptis asplenifolia</u>	<u>FAC</u>	<u>5</u>		
3 <u>Streptopus amplexifolius</u>	<u>FAC</u>	<u>10</u>		
4 _____				
5 _____				

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Typic cryohemist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
0-4	O1	5YR2.5/1	NA	NA	fibrous organic
4-16	O2	5YR3/2	NA	NA	fine fibrous org

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes
Wetland Hydrology Present?	Yes
Hydric Soils Present?	Yes
Is this Sampling Point Within a Wetland?	Yes

Vegetation Photo #: no photo Looking: _____

Soil Photo #: no photo

(optional) Photo# _____: Explain: _____

Remarks:

GPS pt 120

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/28/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 800+00 Plot ID: 800-4 Cowardin Class: PEM1B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: _____ Other indicators: _____

Hydrophytic vegetation?: Yes Basis: Vegetation similar to 800-2

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Typic cryohemist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	<u>soils like 800-2</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: no photo Looking: _____

Soil Photo #: no photo

(optional) Photo# _____: Explain: _____

Remarks:

GPS pt. ? _____

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/28/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 830+00 Plot ID: 830-1 Cowardin Class: PFO4B/PEM1B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Pinus contorta var. contorta</u>	<u>FACW</u>	<u>30</u>		<u>2</u>
2 _____				
3 _____				
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Ledum groenlandicum</u>	<u>FACW</u>	<u>15</u>		
2 <u>Alnus viridis ssp. sinuata</u>	<u>FAC</u>	<u>20</u>		<u>3</u>
3 <u>Vaccinium ovalifolium</u>	<u>FAC</u>	<u>5</u>		
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Eleocharis palustris</u>	<u>OBL</u>	<u>70</u>		<u>1</u>
2 <u>Carex buxbaumii</u>	<u>FACW</u>	<u>10</u>		
3 <u>Lysichiton americanus</u>	<u>OBL</u>	<u>5</u>		
4 <u>Fauria crista-galli</u>	<u>FACW</u>	<u>10</u>		
5 _____				

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: 12 (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): Kina peat Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): Typic cryohemist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
1-0	NA	NA	NA	NA	rooted organic
0-16	O	5YR3/2	NA	NA	peat

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes
Wetland Hydrology Present?	Yes
Hydric Soils Present?	Yes
Is this Sampling Point Within a Wetland?	Yes

Vegetation Photo #: 830-1-veg Looking: _____

Soil Photo #: 830-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS pt 121



Needleleaf forested wetland and emergent wetland vegetation at site 830-1



Hydric peat soil at site 830-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/28/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 830+00 Plot ID: 830-2 Cowardin Class: PEM1B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: _____ Other indicators: _____

Hydrophytic vegetation?: Yes Basis: Vegetation similar to 800-2

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Typic sphagnofibris Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	<u>soils like 800-2</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: no photo Looking: _____

Soil Photo #: no photo

(optional) Photo# _____: Explain: _____

Remarks:

GPS pt. ? _____

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/31/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 895+00 Plot ID: 895-1 Cowardin Class: PFO4B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Tsuga heterophylla</u>	<u>FAC</u>	<u>60</u>	<u>2</u>
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Vaccinium ovalifolium</u>	<u>FAC</u>	<u>60</u>	<u>1</u>
2 <u>Menziesia ferruginia</u>	<u>FACU</u>	<u>20</u>	<u>3</u>
3 <u>Tsuga heterophylla</u>	<u>FAC</u>	<u>20</u>	<u>4</u>
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Cornus canadensis</u>	<u>FAC</u>	<u>10</u>	_____
2 <u>Coptis asplenifolia</u>	<u>FAC</u>	<u>20</u>	<u>5</u>
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name _____

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations _____

Taxonomy (Subgroup): Lithic cryofibril Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
4-0	NA	NA	NA	NA	rooted organic
0-7	O	10YR2/2	NA	NA	fibrous peat
7+	NA	NA	NA	NA	rock

Hydric Soil Indicators:

___ Histosol	___ Concretions
<input checked="" type="checkbox"/> Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 895-1-veg Looking: _____

Soil Photo #: 895-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

New point 24



Needleleaf forested wetland at site 895-1



Hydric soil at site 895-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/30/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 900+00 Plot ID: 900-1 Cowardin Class: E2EM1P

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Myrica gale</u>	<u>OBL</u>	<u>5</u>	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Deschampsia cespitosa</u>	<u>FAC</u>	<u>15</u>	<u>2</u>
2 <u>Argentina anserina</u>	<u>FACW</u>	<u>15</u>	<u>1</u>
3 <u>Lupinus nootkatensis</u>	<u>FAC</u>	<u>10</u>	_____
4 <u>Juncus triglumis</u>	<u>FACW</u>	<u>5</u>	_____
5 <u>Iris setosa</u>	<u>FAC</u>	<u>10</u>	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:**Primary Indicators:**

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): Tidal sediments Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
1-0	NA	NA	NA	NA	rooted organic
0-1	A	10YR7/2	NA	NA	sand
1-16	B	10YR4/3	NA	NA	gravel

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: 900-1-veg Looking: _____

Soil Photo #: 900-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

New point 21; meadow salt affected



Estuarine emergent vegetation at site 900-1



Upland soils at site 900-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/30/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 910+00 Plot ID: 910-1 Cowardin Class: closed needleleaf forest

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Tsuga heterophylla</u>	<u>FAC</u>	<u>15</u>	<u> </u>
2 <u>Picea sitchensis</u>	<u>FACU</u>	<u>85</u>	<u>1</u>
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Menziesia ferruginea</u>	<u>FACU</u>	<u>2</u>	<u> </u>
2 <u>Oplapanax horridus</u>	<u>FAC</u>	<u>2</u>	<u> </u>
3 <u>Vaccinium ovalifolium</u>	<u>FAC</u>	<u>1</u>	<u> </u>
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Cornus canadensis</u>	<u>FACU</u>	<u>1</u>	<u> </u>
2 <u>Rubus pedatus</u>	<u>FAC</u>	<u>10</u>	<u> </u>
3 <u>Streptopus amplexifolus</u>	<u>FAC</u>	<u>2</u>	<u> </u>
4 _____	_____	_____	_____
5 _____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 0% Other indicators: _____

Hydrophytic vegetation?: No Basis: 0% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name _____

(Series and Phase): _____ Drainage Class: well drained

Field Observations _____

Taxonomy (Subgroup): Non-hydric soils Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
2-0	NA	NA	NA	NA	rooted organic
0-2	OA	2.5YR2.5/2	NA	NA	organic
2-16	B	10YR3/2	NA	NA	gravel

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? No
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: 910-1-veg Looking: _____

Soil Photo #: 910-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

New point 17



Needleleaf forest at site 910-1



Upland soils at site 910-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/30/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 910+00 Plot ID: 910-2 Cowardin Class: PFO4B/PEM1B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Tsuga heterophylla</u>	<u>FAC</u>	<u>20</u>	<u>3</u>
2 <u>Picea sitchensis</u>	<u>FACU</u>	<u>10</u>	
3 _____			
4 _____			
5 _____			

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Menziesia ferruginea</u>	<u>FACU</u>	<u>10</u>	
2 <u>Oplapanax horridus</u>	<u>FAC</u>	<u>1</u>	
3 <u>Vaccinium ovalifolium</u>	<u>FAC</u>	<u>10</u>	
4 _____			
5 _____			

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Hippuris vulgaris</u>	<u>OBL</u>	<u>15</u>	
2 <u>Carex sitchensis</u>	<u>OBL</u>	<u>25</u>	<u>1</u>
3 <u>Lysichiton americanus</u>	<u>OBL</u>	<u>10</u>	
4 <u>Caltha palustris</u>	<u>OBL</u>	<u>20</u>	<u>2</u>
5 <u>Menyanthes trifoliata</u>	<u>OBL</u>	<u>10</u>	

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 1 (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:Primary Indicators:

X Saturated in Upper 12 Inches
X Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name _____

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations _____

Taxonomy (Subgroup): Typic shagnofibrist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
<u>1-0</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>live sphagnum</u>
<u>0-16</u>	<u>O</u>	<u>10YR4/6</u>	<u>NA</u>	<u>NA</u>	<u>sphagnum peat</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

<u>X</u> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 910-2-veg Looking: _____

Soil Photo #: 910-2-soil

(optional) Photo# _____: Explain: _____

Remarks:

New point 19



Needleleaf forested and emergent wetland vegetation at site 910-2



Hydric soil vegetation at wetland site 910-2

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/30/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 910+00 Plot ID: 910-3 Cowardin Class: closed needleleaf forest

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Tsuga heterophylla</u>	<u>FAC</u>	<u>20</u>	<u>2</u>
2 <u>Picea sitchensis</u>	<u>FACU</u>	<u>80</u>	<u>1</u>
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Menziesia ferruginea</u>	<u>FACU</u>	<u>15</u>	_____
2 <u>Vaccinium ovalifolium</u>	<u>FAC</u>	<u>10</u>	_____
3 <u>Oplapanax horridus</u>	<u>FAC</u>	<u>5</u>	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Dryopteris expansa</u>	<u>FACU</u>	<u>5</u>	_____
2 <u>Coptis asplenfolia</u>	<u>FAC</u>	<u>20</u>	<u>3</u>
3 <u>Rubus pedatus</u>	<u>FAC</u>	<u>5</u>	_____
4 <u>Gymnocarpium dryopteris</u>	<u>FACU</u>	<u>10</u>	_____
5 <u>Cornus canadensis</u>	<u>FACU</u>	<u>20</u>	<u>4</u>

% of species that are OBL, FACW, and/or FAC: 50% Other indicators: _____

Hydrophytic vegetation?: No Basis: 50% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: 16 (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Typic cryosaprist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
1-0	NA	NA	NA	NA	rooted organic
0-16	O	10YR2/2	NA	NA	fine organics

Hydric Soil Indicators:

<u>X</u> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 910-3-veg Looking: _____

Soil Photo #: 910-3-soil

(optional) Photo# _____: Explain: _____

Remarks:

New point 20



Needleleaf forest at site 910-3



Upland soil at site 910-3

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/30/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: Slate Creek Ferry Plot ID: Slate Creek Ferry Cowardin Class: E2BB1N

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Heracleum maximum</u>	<u>FACU</u>	<u>40</u>	<u>2</u>
2 <u>Achillea millefolium</u>	<u>FACU</u>	<u>15</u>	_____
3 <u>Galium boreale</u>	<u>FACU</u>	<u>50</u>	<u>1</u>
4 <u>Hordeum brachyantherum</u>	<u>FACW</u>	<u>30</u>	<u>3</u>
5 <u>Calamagrostis nutkaensis</u>	<u>FAC</u>	<u>10</u>	_____

% of species that are OBL, FACW, and/or FAC: 23% Other indicators: _____

Hydrophytic vegetation?: No Basis: 23% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
0+	NA	NA	NA	NA	gravel
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? No
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: Slate Creek Ferry (photos 23-27) Looking: _____

Soil Photo #: no photo

(optional) Photo# _____: Explain: _____

Remarks:

New point 22



Estuarine beach bar vegetation at Slate Creek ferry terminal site



Estuarine beach bar vegetation at Slate Creek ferry terminal site



Slate Creek ferry terminal site



Slate Creek ferry terminal site



Estuarine beach bar vegetation at Slate Creek ferry terminal site

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/30/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 950+00 Plot ID: 950-1 Cowardin Class: PEM1B/PSS4B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Pinus contorta var. contorta</u>	<u>FACW</u>	<u>20</u>	<u>4</u>
2 <u>Ledum groenlandicum</u>	<u>FACW</u>	<u>5</u>	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Eleocharis palustris</u>	<u>OBL</u>	<u>75</u>	<u>1</u>
2 <u>Empetrum nigrum ssp. nigrum</u>	<u>FAC</u>	<u>20</u>	<u>2</u>
3 <u>Drosera anglica</u>	<u>OBL</u>	<u>20</u>	<u>3</u>
4 <u>Menyanthes trifoliata</u>	<u>OBL</u>	<u>15</u>	_____
5 <u>Rubus chamaemorus</u>	<u>FACW</u>	<u>10</u>	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-6 (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:**Primary Indicators:**

☒ Saturated in Upper 12 Inches
☒ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
3-0	NA	NA	NA	NA	live sphagnum
0-3	OA	10YR2/2	NA	NA	peat
3-16	OB	7.5YR2.5/2	NA	NA	peat

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 950-1-veg Looking: _____

Soil Photo #: 950-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

New point 13



Emergent and scrub-shrub vegetation at site 950-1



Hydric peat soils at site 950-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/30/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 955+00 Plot ID: 955-1 Cowardin Class: PEM1B/PSS4B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	<u>FAC</u>	<u>50</u>	<u>2</u>
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Pinus contorta var. contorta</u>	<u>FACW</u>	<u>20</u>	<u>4</u>
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Rubus chamaemorus</u>	<u>FACW</u>	<u>10</u>	_____
2 <u>Menyanthes trifoliata</u>	<u>OBL</u>	<u>5</u>	_____
3 <u>Eleocharis palustris</u>	<u>OBL</u>	<u>60</u>	<u>1</u>
4 <u>Drosera rotundifolia</u>	<u>OBL</u>	<u>10</u>	_____
5 <u>Juncus triglumis</u>	<u>FACW</u>	<u>30</u>	<u>3</u>

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-6 (in.)
Depth to Free Water in Pit: 16 (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:Primary Indicators:

☒ Saturated in Upper 12 Inches
☒ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name _____

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations _____

Taxonomy (Subgroup): Typic cryofibrist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
<u>4-0</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>rooted organic</u>
<u>0-16</u>	<u>O</u>	<u>10YR3/3</u>	<u>NA</u>	<u>NA</u>	<u>peat</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 955-1-veg Looking: _____

Soil Photo #: 955-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

New point 14



Emergent and scrub-shrub wetland vegetation at site 955-1



Hydric peat soils at site 955-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/30/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 955+00 Plot ID: 955-2 Cowardin Class: PFO4B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Tsuga heterophylla</u>	<u>FAC</u>	<u>50</u>	<u>1</u>
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Menziesia ferruginea</u>	<u>FACU</u>	<u>40</u>	<u>2</u>
2 <u>Vaccinium ovalifolium</u>	<u>FAC</u>	<u>20</u>	<u>3</u>
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Lysichiton americanus</u>	<u>OBL</u>	<u>15</u>	_____
2 <u>Cornus canadensis</u>	<u>FACU</u>	<u>10</u>	_____
3 <u>Coptis asplenifolia</u>	<u>FAC</u>	<u>15</u>	_____
4 <u>Maianthemum dilatatum</u>	<u>FAC</u>	<u>15</u>	_____
5 _____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 67% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 67% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: 16 (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:Primary Indicators:

X Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name _____

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations _____

Taxonomy (Subgroup): Typic cyrohemist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
1-0	NA	NA	NA	NA	rooted organic
0-16	O	10YR2/1	NA	NA	peat

Hydric Soil Indicators:

<u>X</u> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 955-2-veg Looking: _____

Soil Photo #: 955-2-soil

(optional) Photo# _____: Explain: _____

Remarks:

New point 15



Needleleaf forested wetland vegetation at site 955-2



Hydric soil at 955-2

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/30/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 1185+00 Plot ID: 1185-1 Cowardin Class: PFO4B/PSS1B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Tsuga heterophylla</u>	<u>FAC</u>	<u>20</u>	<u>5</u>
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Vaccinium ovalifolium</u>	<u>FAC</u>	<u>60</u>	<u>1</u>
2 <u>Menziesia ferruginea</u>	<u>FACU</u>	<u>20</u>	<u>3</u>
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Coptis asplenifolia</u>	<u>FAC</u>	<u>20</u>	<u>4</u>
2 <u>Streptopus amplexifolius</u>	<u>FAC</u>	<u>5</u>	_____
3 <u>Fauria crista-galli</u>	<u>OBL</u>	<u>30</u>	<u>2</u>
4 <u>Lysichiton americanus</u>	<u>OBL</u>	<u>10</u>	_____
5 <u>Cornus canadensis</u>	<u>FACU</u>	<u>15</u>	_____

% of species that are OBL, FACW, and/or FAC: 80% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 80% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: 16 (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

X Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: very poorly drained

Field Observations

Taxonomy (Subgroup): Typic cryohemist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
2-0	NA	NA	NA	NA	rooted organic
0-16	O	10YR2/1	NA	NA	mucky peat

Hydric Soil Indicators:

<u>X</u> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 1185-1-veg Looking: _____

Soil Photo #: 1185-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

New point 8; line 10, needs to be moved to the east at the southern part of the line



Needleleaf forested and deciduous scrub-shrub
wetland vegetation at site 1185-1



Hydric soil at site 1185-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/26/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 1260+00 Plot ID: 1260-1 Cowardin Class: PFO4B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Tsuga heterophylla</u>	<u>FAC</u>	<u>20</u>		
2 <u>Tsuga mertensiana</u>	<u>FAC</u>	<u>20</u>		
3 <u>Picea sitchensis</u>	<u>FACU</u>	<u>1</u>		
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Menziesia ferruginea</u>	<u>FACU</u>	<u>20</u>		<u>3</u>
2 <u>Vaccinium ovalifolium</u>	<u>FAC</u>	<u>40</u>		<u>2</u>
3 _____				
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Lysichiton americanum</u>	<u>OBL</u>	<u>10</u>		
2 <u>Coptis asplenifolia</u>	<u>FAC</u>	<u>40</u>		<u>1</u>
3 _____				
4 _____				
5 _____				

% of species that are OBL, FACW, and/or FAC: 67% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 67% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: 16 (in.)
Depth to Saturated Soil: 1 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

X Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
3-0	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>
0-9	<u>O</u>	<u>10YR2/1</u>	<u>NA</u>	<u>NA</u>	<u>fibrous</u>
9-16	<u>B</u>	<u>10YR5/3</u>	<u>NA</u>	<u>NA</u>	<u>cobble gravel</u>

Hydric Soil Indicators:

___ Histosol	___ Concretions
<u>X</u> Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 1270-1-veg Looking: _____

Soil Photo #: 1270-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 94



Needleleaf forested wetland vegetation at site 1260-1



Hydric soil with water at bottom of soil pit at site 1260-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/26/03

Weather Conditions: cloudy, light rain

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 1445+00 Plot ID: 1445-1 Cowardin Class: mesic forb herbaceous

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Athyrium filix-femina</u>	<u>FAC</u>	<u>60</u>	_____	<u>1</u>
2 <u>Heracleum maximum</u>	<u>FACU</u>	<u>20</u>	_____	<u>3</u>
3 <u>Leymus arenarius</u>	<u>FACU</u>	<u>30</u>	_____	<u>2</u>
4 <u>Achillea millefolium</u>	<u>FACU</u>	<u>10</u>	_____	_____
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 23% Other indicators: _____

Hydrophytic vegetation?: No Basis: 23% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): Upland soil Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
1-0	NA	NA	NA	NA	rooted organic
0-2	O	5YR4/2	NA	NA	fibrous organic
2-8	A	10YR4/2	NA	NA	sand
8+	B	NA	NA	NA	bedrock

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? No
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: 1445-1-veg Looking: _____

Soil Photo #: 1445-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 92, line 93



Herbaceous forbs at site 1445-1



Upland soils at site 1445-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/27/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 2630+00 Plot ID: 2630-1 Cowardin Class: E2EM1N

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Carex lyngbyei</u>	<u>OBL</u>	<u>70</u>	_____	<u>1</u>
2 <u>Argentina anserina</u>	<u>FACW</u>	<u>50</u>	_____	<u>2</u>
3 <u>Eleocharis palustris</u>	<u>OBL</u>	<u>30</u>	_____	<u>3</u>
4 <u>Leymus arenarius</u>	<u>FACU</u>	<u>5</u>	_____	_____
5 <u>Plantago maritima</u>	<u>FACW</u>	<u>5</u>	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-12 (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
☒ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
☒ Drainage Patterns in Wetlands: streams

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): Tidal flats

Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
0-16					gravel/sand

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
<input checked="" type="checkbox"/> Reducing Conditions	___ Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: 2630-1-veg Looking: _____

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:

GPS line 95



Estuarine emergent vegetation at site 2630-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/27/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 2630+00 Plot ID: 2630-2 Cowardin Class: herbaceous mesic forb

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Argentina anserina</u>	<u>FACW</u>	<u>40</u>	_____	<u>2</u>
2 <u>Heracleum maximum</u>	<u>FACU</u>	<u>60</u>	_____	<u>1</u>
3 <u>Achillea millefolium</u>	<u>FACU</u>	<u>5</u>	_____	_____
4 <u>Angelica genuflexa</u>	<u>FACW</u>	<u>15</u>	_____	_____
5 <u>Lathyrus japonicus</u>	<u>FAC</u>	<u>10</u>	_____	_____

% of species that are OBL, FACW, and/or FAC: 50% Other indicators: _____

Hydrophytic vegetation?: No Basis: 50% of vegetation is hydrophytic

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
☒ Drainage Patterns in Wetlands: stream, dry beds, oxidized roots at 14-16 in.

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): Typic cryaqueant Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
2-0	NA	NA	NA	NA	rooted organic
0-2	O	10YR5/2	NA	NA	organics
2-16	A	10YR5/1	NA	NA	fine silt

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? No
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: 2630-2-veg Looking: _____

Soil Photo #: 2630-2-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS point 99



Herbaceous forbs at site 2630-2



Upland soil at site 2630-2

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/27/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 2630+00 Plot ID: 2630-3 Cowardin Class: herbaceous mesic forb

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Heracleum maximum</u>	<u>FACU</u>	<u>40</u>	_____	<u>1</u>
2 <u>Angelica genuflexa</u>	<u>FACW</u>	<u>20</u>	_____	<u>2</u>
3 <u>Calamagrostis nutkaensis</u>	<u>FAC</u>	<u>15</u>	_____	_____
4 <u>Deschampsia cespitosa</u>	<u>FAC</u>	<u>10</u>	_____	_____
5 <u>Lupinus nootkatensis</u>	<u>FAC</u>	<u>20</u>	_____	<u>3</u>

% of species that are OBL, FACW, and/or FAC: 67% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 67% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): Typic cryaqueant Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
2-0	NA	NA	NA	NA	rooted organic
0-2	A	10YR5/2	NA	NA	sand w/ organic
2-16	B	10YR5/2	NA	NA	sandy gravel

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: 2630-3-veg Looking: _____

Soil Photo #: 2630-2-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS pt 98, line 96



Herbaceous forbs at site 2630-3



Upland soil at site 2630-3

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/27/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 2665+00 Plot ID: 2665-1 Cowardin Class: Byroid
herbaceous/mosses and lichens bordered by open tall scrub

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Picea sitchensis</u>	<u>FACU</u>	<u>30</u>	_____	<u>3</u>
2 <u>Alnus viridis ssp. crispa</u>	<u>FAC</u>	<u>40</u>	_____	<u>2</u>
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>mosses and lichens</u>	<u>NI</u>	<u>90</u>	_____	<u>1</u>
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 23% Other indicators: _____

Hydrophytic vegetation?: No Basis: 23% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): Uplands soil Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
0-1	A	10YR5/2	NA	NA	sand
1-16	B	10YR5/3	NA	NA	gravel/sand

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? No
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: 2665-1-veg Looking: _____

Soil Photo #: 2665-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS point 99



Mosses and lichens at site 2665-1



Gravel and sand upland soil at site 2665-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/27/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 2705+00 Plot ID: 2705-1 Cowardin Class: E2EM1P

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Leymus arenarius</u>	<u>FACU</u>	<u>15</u>	_____	_____
2 <u>Lathyrus japonicus</u>	<u>FAC</u>	<u>60</u>	_____	<u>1</u>
3 <u>Poa eminens</u>	<u>FAC</u>	<u>15</u>	_____	_____
4 <u>Achillea millefolium</u>	<u>FACU</u>	<u>5</u>	_____	_____
5 <u>Ligusticum scotchicum</u>	<u>FAC</u>	<u>20</u>	_____	<u>2</u>

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA(in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:**Primary Indicators:**

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
☒ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: river terrace

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
1-0	NA	NA	NA	NA	rooted organic
0-5	A	10YR4/2	NA	NA	sand w/ organics
5-16	B	10YR5/2	NA	NA	sand

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: 2705-1-veg Looking: _____

Soil Photo #: 2705-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS pt 101, line 100



Estuarine emergent vegetation at site 2705-1



Upland soil at site 2705-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/2703

Weather Conditions: sunny, windy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 2735+00 Plot ID: 2735-1 Cowardin Class: E2EM1N

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Carex lyngbyei</u>	<u>OBL</u>	<u>70</u>	_____	<u>1</u>
2 <u>Argentina anserina</u>	<u>FACW</u>	<u>40</u>	_____	<u>2</u>
3 <u>Juncus filiformis</u>	<u>FACW</u>	<u>15</u>	_____	_____
4 <u>Iris setosa</u>	<u>FAC</u>	<u>10</u>	_____	_____
5 <u>Eleocharis nitida</u>	<u>OBL</u>	<u>30</u>	_____	<u>3</u>

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): Typic cryaqueant Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
1-0	NA	NA	NA	NA	rooted organic
0-2	OA	10YR4/2	NA	NA	organics
2-16	OB	10YR5/1	NA	NA	sandy gravel

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: 2735-1-veg Looking: _____

Soil Photo #: 2735-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS pt 103, line 102 Tidally influenced



Estuarine emergent vegetation at site 2735-1



Upland soil at site 2735-1



Katzehin River ferry terminal site looking north



Katzehin River ferry terminal site looking south



Katzehin River ferry terminal site looking south



Katzehin River ferry terminal site



View of Haines from Katzechin River ferry terminal site

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/2703

Weather Conditions: sunny, windy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 2735+00 Plot ID: 2735-2 Cowardin Class: E2BB1P

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Carex lyngbyei</u>	<u>OBL</u>	<u>70</u>	_____	<u>1</u>
2 <u>Argentina anserina</u>	<u>FACW</u>	<u>40</u>	_____	<u>2</u>
3 <u>Juncus filiformis</u>	<u>FACW</u>	<u>15</u>	_____	_____
4 <u>Iris setosa</u>	<u>FAC</u>	<u>10</u>	_____	_____
5 <u>Eleocharis nitida</u>	<u>OBL</u>	<u>30</u>	_____	<u>3</u>

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
1-16	NA	NA	NA	NA	gravel

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: _____ Looking: _____

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:



Estuarine beach bar vegetation at site 2735-2

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/27/03

Weather Conditions: sunny, windy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 3615+00 Plot ID: 3615-1 Cowardin Class: POWH

Do Normal Circumstances exist on the site? No

Is the site significantly disturbed (Atypical Situation)? Yes

Is the area a potential Problem Area? Yes; hydroelectric dam for City of Skagway

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Equisetum fluvatile</u>	<u>OBL</u>	<u>50</u>	_____	<u>1</u>
2 <u>Carex aquatilis</u>	<u>OBL</u>	<u>20</u>	_____	<u>2</u>
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% dominant veg is hydrophytic

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-several feet (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
☒ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: stream

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): NA – aquatic site Drainage Class: NA

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes; not a naturally created wetland

Vegetation Photo #: 3615-1-veg Looking: _____

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:

GPS pt 106, line 105



Open water and surrounding emergent vegetation,
hydrodam near Lower Dewey Lake in Skagway

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/27/03

Weather Conditions: sunny, windy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 3615+00 Plot ID: 3615-2 Cowardin Class: POWH

Do Normal Circumstances exist on the site? No

Is the site significantly disturbed (Atypical Situation)? Yes

Is the area a potential Problem Area? Yes; spawning area for Pacific salmon/public use area

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: _____ Other indicators: many weedy species along edge of pond, barren spots, no veg within the pond/creek

Hydrophytic vegetation?: Basis: _____

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-several feet (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
☒ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: part of Dewey Creek

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): NA aquatic site Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes; a part of Dewey Creek

Vegetation Photo #: no photo Looking: _____

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:

Sampling area, pond in the middle of Skagway surrounded by development, connected to Dewey Creek. Barren
areas of vegetation due to foot traffic; GPS pt 107

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WEST LYNN CANAL
FIELD NOTES AND SITE PHOTOS

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Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/24/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 4030+00 Plot ID: 4030-1 Cowardin Class: E2RS2N

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: _____ Other indicators: _____

Hydrophytic vegetation?: _____ Basis: _____

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): No soil pit – gravel Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
0-16	NA	NA	NA	NA	boulder/gravel

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? No
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: _____ Looking: _____

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:

WHB ferry terminal, photos 1-7



Rocky shore at William Henry Bay ferry terminal site



Rocky shore at William Henry Bay ferry terminal site



Rocky shore at William Henry Bay ferry terminal site



Rock cliffs bordering William Henry Bay ferry terminal site



Rock cliffs bordering William Henry Bay ferry terminal site



Rocky shore at William Henry Bay ferry terminal site



Rocky shore and cliffs at William Henry Bay ferry terminal site

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/24/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 4040+00 Plot ID: 4040-1 Cowardin Class: PEM1B/PSS1B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Tsuga heterophylla</u>	<u>FAC</u>	<u>1</u>		
2 <u>Picea sitchensis</u>	<u>FACU</u>	<u>10</u>		
3 _____				
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Viburnum edule</u>	<u>FACU</u>	<u>5</u>		
2 <u>Alnus crispa</u>	<u>FAC</u>	<u>25</u>		<u>2</u>
3 _____				
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Lysichiton americanum</u>	<u>OBL</u>	<u>15</u>		
2 <u>Carex aquatilis var. sitchensis</u>	<u>OBL</u>	<u>70</u>		<u>1</u>
3 <u>Carex pluriflora</u>	<u>OBL</u>	<u>10</u>		
4 _____				
5 _____				

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):

___ Stream, Lake, or Tide Gauge

___ Aerial Photographs

___ Other

X No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)

Depth to Free Water in Pit: NA (in.)

Depth to Saturated Soil: 1 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

X Saturated in Upper 12 Inches

___ Inundated

___ Water Marks

___ Drift Lines

___ Sediment Deposits

X Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches

___ Water-Stained Leaves

___ Local Soil Survey Data

___ Local Soil Survey Data

___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Fluvaquentic cryofibrist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
4-0	NA	NA	NA	NA	rooted organic
0-16	O	10YR2/2	NA	NA	sandy peat

Hydric Soil Indicators:

X Histosol

___ Histic Epipedon

___ Sulfidic Odor

___ Aquic Moisture Regime

___ Reducing Conditions

___ Gleyed or Low-Chroma Colors

___ Concretions

___ High Organic Content in Surface Layer in Sandy Soils

___ Organic Streaking in Sandy Soils

___ Listed on Local Hydric Soils List

___ Listed on National Hydric Soils List

___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes

Wetland Hydrology Present? Yes

Hydric Soils Present? Yes

Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 4040-1-veg Looking: _____

Soil Photo #: 4040-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 37, endpoint 38 and 40



Emergent and scrub-shrub wetland vegetation at site 4040-1



Hydric peat soil at site 4040-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/24/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 4040+00 Plot ID: 4040-2 Cowardin Class: PFO4B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Tsuga heterophylla</u>	<u>FAC</u>	<u>90</u>		<u>1</u>
2 _____				
3 _____				
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Menziesia ferruginea</u>	<u>FACU</u>	<u>10</u>		
2 <u>Rubus spectabilis</u>	<u>FACU</u>	<u>10</u>		
3 <u>Oplapanax horridus</u>	<u>FAC</u>	<u>5</u>		
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Lysichiton americanum</u>	<u>OBL</u>	<u>70</u>		<u>2</u>
2 <u>Coptis trifolia</u>	<u>FAC</u>	<u>5</u>		
3 <u>Streptopus amplexifolius</u>	<u>FAC</u>	<u>5</u>		
4 _____				
5 _____				

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: 16 (in.)
Depth to Saturated Soil: 1 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: Very poorly drained

Field Observations

Taxonomy (Subgroup): Typic cryohemist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
1-0	NA	NA	NA	NA	rooted organic
1-8	O	10YR2/2	NA	NA	fibrous peat
8-16	O	10YR2/1	NA	NA	fibrous peat

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 4040-2-veg Looking: _____

Soil Photo #: 4040-2-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 41, Lysichiton americanum comes down to beach



Needleleaf forested wetland vegetation at site 4040-2



Hydric peat soil at site 4040-2

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/23/03

Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 4315+00 Plot ID: 4315-1 Cowardin Class: R3US1/R3UB1

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Salix alaxensis</u>	<u>FAC</u>	<u>1</u>		<u>1</u>
2 <u>Alnus crispa</u>	<u>FAC</u>	<u>1</u>		<u>2</u>
3 <u>Salix sphenophylla</u>	<u>FAC</u>	<u>1</u>		<u>3</u>
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____				
2 _____				
3 _____				
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Epilobium latifolium</u>	<u>FAC</u>	<u>1</u>		<u>4</u>
2 _____				
3 _____				
4 _____				
5 _____				

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): No soil pit – gravel Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: 4315-1-veg Looking: SW

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 19; 20, 21 and 22 along north bank



River bar vegetation at site 4315-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/23/03

Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 4315+00 Plot ID: 4315-2 Cowardin Class: open broadleaf forest with scrub undergrowth

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Populus balsamifera</u>	<u>FACU</u>	<u>80</u>		<u>1</u>
2 <u>Alnus crispa</u>	<u>FAC</u>	<u>20</u>		<u>3</u>
3 _____				
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Viburnum edule</u>	<u>FACU</u>	<u>30</u>		<u>2</u>
2 <u>Picea sitchensis</u>	<u>FACU</u>	<u>1</u>		
3 <u>Cornus canadensis</u>	<u>FACU</u>	<u>15</u>		
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____				
2 _____				
3 _____				
4 _____				
5 _____				

% of species that are OBL, FACW, and/or FAC: 23% Other indicators: _____

Hydrophytic vegetation?: No Basis: 23% of dominant species are hydrophytic vegetation.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:**Primary Indicators:**

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): Alluvial river deposits Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
1-0	NA	NA	NA	NA	rooted organic
0-1	A	10YR3/1	NA	NA	fine sand/silt
1-16	B	10YR4/2	NA	NA	fine sand

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? No
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: 4315-2-veg Looking: NE

Soil Photo #: 4315-2-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 23



Deciduous scrub-shrub undergrowth within open broadleaf forest at site 4315-2



Upland soil at site 4315-2

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/23/03

Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 4315+00 Plot ID: 4315-3 Cowardin Class: closed tall scrub

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Populus balsamifera</u>	<u>FACU</u>	<u>15</u>		<u>2</u>
2 <u>Salix barclayi</u>	<u>FAC</u>	<u>25</u>		<u>1</u>
3 <u>Salix alaxensis</u>	<u>FAC</u>	<u>15</u>		<u>3</u>
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____				
2 _____				
3 _____				
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Calamagrostis canadensis</u>	<u>FAC</u>	<u>5</u>		
2 <u>Epilobium angustifolium</u>	<u>FACU</u>	<u>2</u>		
3 <u>Achillea millefolium</u>	<u>FACU</u>	<u>2</u>		
4 _____				
5 _____				

% of species that are OBL, FACW, and/or FAC: 67% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 67% of dominant species are hydrophytic vegetation.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA(in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): Alluvial deposited material Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
0-2	A	10YR3/1	NA	NA	sandy silt
2-16	B	10YR3/2	NA	NA	gravel

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: 4315-3-veg Looking: East

Soil Photo #: 4315-3-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 24, boundary points 25 and 26 along bank



Tall broadleaf scrub-shrub vegetation at site 4315-3



Upland soil at site 4315-3

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/23/03

Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 4410+00 Plot ID: 4410-1 Cowardin Class: PFO4B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Tsuga heterophylla</u>	<u>FAC</u>	<u>65</u>		<u>2</u>
2 <u>Picea sitchensis</u>	<u>FACU</u>	<u>5</u>		
3 _____				
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Menziesia ferruginea</u>	<u>UPL</u>	<u>10</u>		
2 <u>Oplopanax horridus</u>	<u>FAC</u>	<u>85</u>		<u>1</u>
3 <u>Vaccinium ovalifolium</u>	<u>FAC</u>	<u>1</u>		
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Verartum viride</u>	<u>FAC</u>	<u>1</u>		
2 <u>Maianthemum dilatatum</u>	<u>FAC</u>	<u>20</u>		<u>3</u>
3 <u>Dryopteris dilatata</u>	<u>FACU</u>	<u>20</u>		<u>4</u>
4 <u>Streptopus amplexifolius</u>	<u>FAC</u>	<u>10</u>		
5 _____				

% of species that are OBL, FACW, and/or FAC: 67% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 67% of dominant species are hydrophytic vegetation.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: Poorly drained

Field Observations

Taxonomy (Subgroup): Lithic cryosaprist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
3-0	NA	NA	NA	NA	rooted organic
0-13	O1	5YR2.5/1	NA	NA	folist organic
13-16	B	10YR4/1	NA	NA	silty/sand
16+					rock

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 4410-1-veg Looking: S

Soil Photo #: 4410-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

No GPS data point



Needleleaf forested wetland at site 4410-1



Hydric soil at site 4410-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/23/03

Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 4770+00 Plot ID: 4770-1 Cowardin Class: PEM1B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Picea sitchensis</u>	<u>FACU</u>	<u>5</u>		
2 _____				
3 _____				
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____				
2 _____				
3 _____				
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Iris setosa</u>	<u>FAC</u>	<u>20</u>		<u>2</u>
2 <u>Calamagrostis canadensis</u>	<u>FAC</u>	<u>20</u>		<u>3</u>
3 <u>Deschampsia cespitosa subsp. beringensis</u>	<u>FAC</u>	<u>10</u>		
4 <u>Angelica lucida</u>	<u>FACU</u>	<u>15</u>		
5 <u>Sanguisorba canadensis</u>	<u>FACW</u>	<u>40</u>		<u>1</u>

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
☒ Drainage Patterns in Wetlands: small stream runs throughout the wetland area

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: Poorly drained

Field Observations

Taxonomy (Subgroup): Typic cryaqueut Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
3-0	NA	NA	NA	NA	rooted organic
0-3	OA	10YR5/1	NA	NA	fibrous
3-16	OB	10YR5/1	10YR4/4	many/medium/distinct	organic silt

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
<input checked="" type="checkbox"/> Reducing Conditions	___ Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 4770-1-veg Looking: _____

Soil Photo #: 4770-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 30, boundary line 28; Carex lyngbyei present in wetland area, connected to wetland 4770-1



Emergent wetland surrounded by needleleaf forest at site 4770-1



Hydric soil at site 4770-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/23/03

Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 4770+00 Plot ID: 4770-2 Cowardin Class: PEM1B (PSS1B on edges)

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Equisetum pratense</u>	<u>FAC</u>	<u>60</u>	_____	<u>1</u>
2 <u>Calamagrostis canadensis</u>	<u>FAC</u>	<u>50</u>	_____	<u>2</u>
3 <u>Achillea millefolium</u>	<u>FACU</u>	<u>30</u>	_____	<u>3</u>
4 <u>Angelica lucida</u>	<u>FACU</u>	<u>10</u>	_____	_____
5 <u>Sanguisorba canadensis</u>	<u>FACW</u>	<u>20</u>	_____	<u>4</u>

% of species that are OBL, FACW, and/or FAC: 75% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 75% of dominant species are hydrophytic vegetation.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: +16 (in.)
Depth to Saturated Soil: 1 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
☒ Drainage Patterns in Wetlands: small streams run throughout the wetland area

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: Very poorly drained

Field Observations

Taxonomy (Subgroup): Kina Peat Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
1-0	NA	NA	NA	NA	rooted organic
0-16	O	5YR2.5/1	NA	NA	fibrous peat

Hydric Soil Indicators:

<input checked="" type="checkbox"/> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 4770-2-veg Looking: North

Soil Photo #: 47740-2-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 32, boundary line 31; connected to wetland 4770-2, Carex lyngbyei present in swale area within the wetland



Emergent wetland vegetation surrounded by deciduous scrub-shrub at site 4770-2



Hydric soil at site 4770-2

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/23/03

Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 4880+00 Plot ID: 4880-1 Cowardin Class: PFO4B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Tsuga heterophylla</u>	<u>FAC</u>	<u>70</u>		<u>1</u>
2 <u>Picea sitchensis</u>	<u>FACU</u>	<u>10</u>		
3 _____				
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Oplapanax horridus</u>	<u>FAC</u>	<u>15</u>		
2 <u>Menziesia ferruginea</u>	<u>FACU</u>	<u>30</u>		<u>4</u>
3 <u>Viburnum edule</u>	<u>FACU</u>	<u>10</u>		
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Lysichiton americanus</u>	<u>OBL</u>	<u>10</u>		
2 <u>Antyrium filix-femina</u>	<u>FAC</u>	<u>30</u>		<u>3</u>
3 <u>Coptis trifolia</u>	<u>FAC</u>	<u>50</u>		<u>2</u>
4 <u>Maianthemum dilatatum</u>	<u>FAC</u>	<u>5</u>		
5 _____				

% of species that are OBL, FACW, and/or FAC: 75% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 75% of dominant species are hydrophytic vegetation; large buttressed Sitka spruce.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 3 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

X Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Terric cryosaprist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
<u>3-0</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>rooted organic</u>
<u>0-5</u>	<u>OA</u>	<u>5YR2.5/1</u>	<u>NA</u>	<u>NA</u>	<u>silty organic</u>
<u>5-16</u>	<u>OB</u>	<u>5YR3/2</u>	<u>NA</u>	<u>NA</u>	<u>gravelly silt</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

X Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 4880-1-veg Looking: East

Soil Photo #: 4880-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 34, buttressed tree roots of large Picea sitchensis



Needleleaf forested wetland vegetation at site 4880-1



Hydric soil at site 4880-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/23/03

Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 4880+00 Plot ID: 4880-2 Cowardin Class: PFO4B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Tsuga heterophylla</u>	<u>FAC</u>	<u>50</u>		<u>1</u>
2 <u>Picea sitchensis</u>	<u>FACU</u>	<u>10</u>		
3 _____				
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Rubus spectabilis</u>	<u>FACU</u>	<u>10</u>		
2 <u>Oplopanax horridus</u>	<u>FAC</u>	<u>30</u>		<u>3</u>
3 _____				
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Lysichiton americanus</u>	<u>OBL</u>	<u>40</u>		<u>2</u>
2 <u>Antyrium filix-femina</u>	<u>FAC</u>	<u>25</u>		<u>4</u>
3 <u>Coptis trifolia</u>	<u>FAC</u>	<u>20</u>		<u>5</u>
4 _____				
5 _____				

% of species that are OBL, FACW, and/or FAC: 80% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 80% of dominant species are hydrophytic vegetation.

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: 16 (in.)
Depth to Saturated Soil: 2 (in.)

Wetland Hydrology Indicators:Primary Indicators:

X Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Typic cryohemist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
2-0	NA	NA	NA	NA	rooted organic
0-16	O	5YR2.5/1	NA	NA	fibrous organic

Hydric Soil Indicators:

<u>X</u> Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 4880-2-veg Looking: East

Soil Photo #: 4880-2-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 35, buttressed tree roots of Picea sitchensis



Needleleaf forested wetland vegetation at site 4880-2



Hyric soil at site 4880-2

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/24/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 4900+00 Plot ID: 4900-1 Cowardin Class: E2EM1P

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Salix sitchensis</u>	<u>FAC</u>	<u>1</u>	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Lathyrus japonicus</u>	<u>FAC</u>	<u>90</u>	_____	<u>1</u>
2 <u>Argentina anserina</u>	<u>FACW</u>	<u>80</u>	_____	<u>2</u>
3 <u>Leymus arenarius</u>	<u>FACU</u>	<u>20</u>	_____	<u>3</u>
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): Tidal flats Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
0-4	A	10YR4/2	NA	NA	silty organic
4-16	B	10YR4/3	NA	NA	gravel/sand

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: 4900-1-veg Looking: _____

Soil Photo #: 4900-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 48, stream 46 and 47, 44 wet/up boundary; dry estuary



Estuarine emergent vegetation at site 4900-1



Non-hydric soil at site 4900-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: aerial photography Weather Conditions: _____

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5150+00 Plot ID: 5150-1 Cowardin Class: R3US1/R3UB1

Do Normal Circumstances exist on the site? Yes No

Is the site significantly disturbed (Atypical Situation)? Yes No

Is the area a potential Problem Area? Yes No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: _____ Other indicators: _____

Hydrophytic vegetation?: Yes _____ No _____ Basis: Vegetation similar to 4040-1

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No (Circle)
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this Sampling Point Within a Wetland?	Yes	No

Vegetation Photo #: _____ Looking: _____

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:

Digitized off aerial photography



Eroding slopes near stream at site 5150-1, looking north from center of alignment



Stream at site 5150-1, looking south from center of alignment



Stream banks at site 5150-1, looking east towards Lynn Canal

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/25/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5485+00 Plot ID: 5485-1 Cowardin Class: E2FL1P

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Plantago maritima</u>	<u>FACW</u>	<u>60</u>	_____	<u>1</u>
2 <u>Leymus arenarius</u>	<u>FACU</u>	<u>30</u>	_____	<u>2</u>
3 <u>Argentina anserina</u>	<u>FACW</u>	<u>25</u>	_____	<u>3</u>
4 <u>Triglochin maritimum</u>	<u>OBL</u>	<u>5</u>	_____	_____
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 67% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 67% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA(in.)
Depth to Free Water in Pit: NA(in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): gravel tidal flats Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
0-16					<u>cobble/gravel</u>

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: 5485-1-veg1 and 5485-1-veg2 Looking: _____

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:

Photos 1 and 2 near estuarine, photo of upland area (5485-2)



Estuarine flats vegetation at site 5485-1



Estuarine flats vegetation at site 5485-1, looking east toward Lynn Canal

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/25/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5485+00 Plot ID: 5485-2 Cowardin Class: closed mixed forest

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Alnus viridis ssp. sinuata</u>	<u>FAC</u>	<u>40</u>		<u>1</u>
2 <u>Picea sitchensis</u>	<u>FACU</u>	<u>30</u>		<u>2</u>
3 <u>Populus balsamifera</u>	<u>FACU</u>	<u>15</u>		
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Viburnum edule</u>	<u>FACU</u>	<u>1</u>		
2 _____				
3 _____				
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Galium boreale</u>	<u>FACU</u>	<u>5</u>		<u>1</u>
2 <u>Athyrium filix-femina</u>	<u>FAC</u>	<u>1</u>		
3 <u>Dryopteris expansa</u>	<u>FACU</u>	<u>1</u>		
4 _____				
5 _____				

% of species that are OBL, FACW, and/or FAC: 50% Other indicators: _____

Hydrophytic vegetation?: No Basis: 50% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA(in.)
Depth to Free Water in Pit: NA(in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): uplands soil Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
2-0	NA	NA	NA	NA	rooted organic
0-16	A	10YR4/2	NA	NA	sandy gravel

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? No
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: 5485-2-veg Looking: _____

Soil Photo #: 5485-2-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 59 outer point, test pit point 62; boundaries 61 and 58



Deciduous undergrowth at site 5485-2



Upland soil at site 5485-2

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/25/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5565+00 Plot ID: 5565-1 Cowardin Class: PEM5C/PAB4H

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Salix sitchensis</u>	<u>FAC</u>	<u>5</u>	_____	_____
2 <u>Salix planifolia</u>	<u>FACW</u>	<u>5</u>	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Carex aquatilis</u>	<u>OBL</u>	<u>30</u>	_____	<u>2</u>
2 <u>Carex utriculata</u>	<u>OBL</u>	<u>10</u>	_____	_____
3 <u>Hippuris vulgaris</u>	<u>OBL</u>	<u>5</u>	_____	_____
4 <u>Potamogetan natans</u>	<u>OBL</u>	<u>10</u>	_____	_____
5 <u>Scirpus cespitosus</u>	<u>OBL</u>	<u>50</u>	_____	<u>1</u>

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-12 (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
☒ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): No soil pit – inundated Drainage Class: Very poorly drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5565-1-veg Looking: _____

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 76; rich pond-mat fringed by sedge, floating mat



Emergent and aquatic bed wetland vegetation at site 5565-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/25/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5565+00 Plot ID: 5565-2 Cowardin Class: PEM5C/PAB4H

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Salix spp.</u>	<u>FAC</u>	<u>10</u>	_____	<u>2</u>
2 <u>Alnus viridis ssp. crispa</u>	<u>FAC</u>	<u>10</u>	_____	<u>3</u>
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Sparganium hyperboreum</u>	<u>OBL</u>	<u>5</u>	_____	_____
2 <u>Potamogeton natans</u>	<u>OBL</u>	<u>5</u>	_____	_____
3 <u>Carex utriculata</u>	<u>OBL</u>	<u>15</u>	_____	<u>1</u>
4 <u>Carex aquatilis</u>	<u>OBL</u>	<u>5</u>	_____	_____
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-2(in.)
Depth to Free Water in Pit: 16(in.)
Depth to Saturated Soil: 1 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
☒ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): No soil pit – inundated Drainage Class: Very poorly drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
0-4	OA	10YR2/2	NA	NA	fibrous peat
4-16	OB	5GY5/1	NA	NA	silt

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5565-2-veg Looking: _____

Soil Photo #: 5565-2-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 77



Emergent and aquatic bed wetland vegetation at site 5565-2



Gleyed hydric soil at site 5565-2

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/25/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5565+00 Plot ID: 5565-3 Cowardin Class: PAB4H

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Salix sitchensis</u>	<u>FAC</u>	<u>5</u>	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Carex aquatilis</u>	<u>OBL</u>	<u>30</u>	_____	<u>2</u>
2 <u>Potamogetan natans</u>	<u>OBL</u>	<u>60</u>	_____	<u>1</u>
3 <u>Sparganium hyperboreum</u>	<u>OBL</u>	<u>5</u>	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):

- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ___ Other

☒ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-6 (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

- ___ Saturated in Upper 12 Inches
- ☒ Inundated
- ___ Water Marks
- ___ Drift Lines
- ___ Sediment Deposits
- ___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

- ___ Oxidized Root Channels in Upper 12 Inches
- ___ Water-Stained Leaves
- ___ Local Soil Survey Data
- ___ Local Soil Survey Data
- ___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): Marsh – organic soil (no soil pit – inundated) Drainage Class: Very poorly drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

- | | |
|---------------------------------|--|
| ___ Histosol | ___ Concretions |
| ___ Histic Epipedon | ___ High Organic Content in Surface Layer in Sandy Soils |
| ___ Sulfidic Odor | ___ Organic Streaking in Sandy Soils |
| ___ Aquic Moisture Regime | ___ Listed on Local Hydric Soils List |
| ___ Reducing Conditions | ___ Listed on National Hydric Soils List |
| ___ Gleyed or Low-Chroma Colors | ___ Other (Explain in Remarks) |

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5565-3-veg Looking: _____

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 78



Aquatic bed wetland vegetation at site 5565-3

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/25/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5565+00 Plot ID: 5565-4 Cowardin Class: PAB4H/PEM5C

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Sparganium hyperboreum</u>	<u>OBL</u>	<u>20</u>	_____	<u>3</u>
2 <u>Potamogeton natans</u>	<u>OBL</u>	<u>70</u>	_____	<u>1</u>
3 <u>Carex aquatilis</u>	<u>OBL</u>	<u>30</u>	_____	<u>2</u>
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-6(in.)
Depth to Free Water in Pit: NA(in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
☒ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): Marsh soil (no soil pit – inundated) Drainage Class: Very poorly drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5565-4-veg Looking: _____

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 79



Aquatic bed and emergent wetland vegetation at site 5565-4

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/25/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5575+00 Plot ID: 5575-1 Cowardin Class: PEM1B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Salix spp.</u>	<u>FAC</u>	<u>10</u>	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Equisetum fluvatile</u>	<u>OBL</u>	<u>5</u>	_____	_____
2 <u>Menyanthes trifoliata</u>	<u>OBL</u>	<u>15</u>	_____	_____
3 <u>Carex utriculata</u>	<u>OBL</u>	<u>80</u>	_____	<u>1</u>
4 <u>Carex aquatilis</u>	<u>OBL</u>	<u>10</u>	_____	_____
5 <u>Comarum palustre</u>	<u>OBL</u>	<u>5</u>	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: 14 (in.)
Depth to Saturated Soil: 1 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

X Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Fluvaquentic cryohemist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
5-0	NA	NA	NA	NA	rooted organic
0-7	OA	5GY4/1	NA	NA	organic silt
7-16	OB	N4/1	NA	NA	sandy silt

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
<u>X</u> Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
<u>X</u> Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes
Wetland Hydrology Present?	Yes
Hydric Soils Present?	Yes
Is this Sampling Point Within a Wetland?	Yes

Vegetation Photo #: 5575-1-veg Looking: _____

Soil Photo #: 5575-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 75; boundary line 74



Emergent vegetation at site 5575-1



Gleyed hydric soil at site 5575-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: aerial photography Weather Conditions: _____

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5585+00 Plot ID: 5585-1 Cowardin Class: R2UBH

Do Normal Circumstances exist on the site? Yes No

Is the site significantly disturbed (Atypical Situation)? Yes No

Is the area a potential Problem Area? Yes No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: _____ Other indicators: _____

Hydrophytic vegetation?: Yes _____ No _____ Basis: Vegetation similar to 4040-1

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No (Circle)
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this Sampling Point Within a Wetland?	Yes	No

Vegetation Photo #: _____ Looking: _____

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:

Davidson Glacier River



Southern banks of the Davidson Glacier River



Eroding southern banks of Davidson Glacier River



Davidson Glacier River, looking east

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/25/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5590+00 Plot ID: 5590-1 Cowardin Class: POWH

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Sparganium hyperboreum</u>	<u>OBL</u>	<u>5</u>	_____	<u>1</u>
2 <u>Carex utriculata</u>	<u>OBL</u>	<u>5</u>	_____	<u>2</u>
3 <u>Carex aquatilis</u>	<u>OBL</u>	<u>5</u>	_____	<u>3</u>
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-12(in.)
Depth to Free Water in Pit: NA(in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:Primary Indicators:

___ Saturated in Upper 12 Inches
X Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): Marsh – no soil pit (inundated) Drainage Class: NA

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5590-1-veg Looking: S

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 69; boundary 70



Open water at site 5590-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/25/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5595+00 Plot ID: 5595-1 Cowardin Class: PEM1C/POWH

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Salix planifolia</u>	<u>FACW</u>	<u>5</u>	_____	_____
2 <u>Salix alaxensis</u>	<u>FAC</u>	<u>5</u>	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Carex aquatilis</u>	<u>OBL</u>	<u>60</u>	_____	<u>1</u>
2 <u>Carex utriculata</u>	<u>OBL</u>	<u>15</u>	_____	<u>3</u>
3 <u>Comarum palustre</u>	<u>OBL</u>	<u>30</u>	_____	<u>2</u>
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
X No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-12 (in.)
Depth to Free Water in Pit: 8 (in.)
Depth to Saturated Soil: 1 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
X Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): Marsh – no soil pit (inundated) Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
4-0	NA	NA	NA	NA	rooted organic
0-4	OA	5GY4/1	NA	NA	silty sand
4-16	OB	5GY4/1	NA	NA	silt

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5595-1-veg Looking: _____

Soil Photo #: 5595-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 67; boundary 68 SW end of pond



Open water and surrounding emergent vegetation at site 5595-1



Gleyed hydric soil at site 5595-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/25/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5600+00 Plot ID: 5600-1 Cowardin Class: PEM5B

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Salix spp.</u>	<u>FAC</u>	<u>5</u>	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Carex aquatilis</u>	<u>OBL</u>	<u>20</u>	_____	<u>3</u>
2 <u>Equisetum fluvatile</u>	<u>OBL</u>	<u>40</u>	_____	<u>1</u>
3 <u>Carex membranacea</u>	<u>FACW</u>	<u>10</u>	_____	_____
4 <u>Carex saxatilis</u>	<u>FACW</u>	<u>30</u>	_____	<u>2</u>
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA(in.)
Depth to Free Water in Pit: NA(in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
☒ Drainage Patterns in Wetlands: stream

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
1-0	NA	NA	NA	NA	rooted organic
0-16	O	2.5Y5/2	10YR4/6	many/large/distinct	silty sand

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
<input checked="" type="checkbox"/> Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5600-1-veg Looking: _____

Soil Photo #: 5600-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 63; boundary 62



Emergent and scrub-shrub vegetation at site 5600-1



Mottled hydric soil at site 5600-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/24/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5610+00 Plot ID: 5610-1 Cowardin Class: PEM5C/POWH

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Salix lanata ssp. richardsonii</u>	<u>FAC</u>	<u>5</u>	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Equisetum fluvatile</u>	<u>OBL</u>	<u>50</u>	_____	<u>1</u>
2 <u>Carex lyngbyei</u>	<u>OBL</u>	<u>10</u>	_____	_____
3 <u>Carex aquatilis</u>	<u>OBL</u>	<u>5</u>	_____	_____
4 <u>Carex utriculata</u>	<u>OBL</u>	<u>15</u>	_____	_____
5 <u>Carex flava</u>	<u>OBL</u>	<u>25</u>	_____	<u>2</u>

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-2 (in.)
Depth to Free Water in Pit: 11 (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
☒ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Le silt loam Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
<u>3-0</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>rooted organic</u>
<u>0-8</u>	<u>A</u>	<u>5YR4/1</u>	<u>NA</u>	<u>NA</u>	<u>silty sand</u>
<u>8-16</u>	<u>B</u>	<u>N5</u>	<u>NA</u>	<u>NA</u>	<u>fine silt</u>

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
<input checked="" type="checkbox"/> Reducing Conditions	___ Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5610-1-veg Looking: _____

Soil Photo #: 5610-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 53; boundaries 51 and 52



Emergent wetland vegetation and open water at site 5610-1



Gleyed hydric soil at site 5610-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/24/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5610+00 Plot ID: 5610-2 Cowardin Class: PEM5C/POWH

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Salix sitchensis</u>	<u>FAC</u>	<u>5</u>		
2 _____				
3 _____				
4 _____				
5 _____				

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____				
2 _____				
3 _____				
4 _____				
5 _____				

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Hippuris vulgaris</u>	<u>OBL</u>	<u>10</u>		
2 <u>Carex saxatilis</u>	<u>FACW</u>	<u>5</u>		
3 <u>Carex utriculata</u>	<u>OBL</u>	<u>90</u>		<u>1</u>
4 _____				
5 _____				

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-12 (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
X Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): No soil pit – inundated Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5610-2-veg Looking: _____

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 55



Emergent wetland vegetation at site 5610-2

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/24/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5610+00 Plot ID: 5610-3 Cowardin Class: PEM5C/PAB4H

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Salix sitchensis</u>	<u>FAC</u>	<u>5</u>	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Equisetum fluvatile</u>	<u>OBL</u>	<u>80</u>	_____	<u>1</u>
2 <u>Carex lyngbyei</u>	<u>OBL</u>	<u>15</u>	_____	_____
3 <u>Carex aquatilis</u>	<u>OBL</u>	<u>5</u>	_____	_____
4 <u>Carex utriculata</u>	<u>OBL</u>	<u>10</u>	_____	_____
5 <u>Potamogeton natans</u>	<u>OBL</u>	<u>1</u>	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-12 (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
☒ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): No soil pit – inundated Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5610-3-veg Looking: _____

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 56



Emergent wetland vegetation at site 5610-3

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/25/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5610+00 Plot ID: 5610-3b Cowardin Class: PEM5C/PAB4H

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Salix sitchensis</u>	<u>FAC</u>	<u>5</u>	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Equisetum fluvatile</u>	<u>OBL</u>	<u>30</u>	_____	<u>1</u>
2 <u>Carex saxatilis</u>	<u>FACW</u>	<u>30</u>	_____	<u>2</u>
3 <u>Carex utriculata</u>	<u>OBL</u>	<u>30</u>	_____	<u>3</u>
4 <u>Potamogeton natans</u>	<u>OBL</u>	<u>10</u>	_____	_____
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 3 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: Very poorly drained

Field Observations

Taxonomy (Subgroup): Humic cryosaprist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
4-0	NA	NA	NA	NA	NA
0-8	OA	5GY4/1	NA	NA	NA
8-16	B	NA	NA	NA	gravel/cobble

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
<input checked="" type="checkbox"/> Reducing Conditions	___ Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5610-3b-veg Looking: _____

Soil Photo #: 5610-3b-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 65 and boundary 66 (other end done on 7/24/03)



Emergent and aquatic bed wetland vegetation at site 5610-3b



Gleyed hydric soil at site 5610-3b

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/29/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5610+00 Plot ID: 5610-4 Cowardin Class: PEM5C/PAB4H

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Salix spp.</u>	<u>FAC</u>	<u>10</u>	_____
2 <u>Alnus viridis ssp. crispa</u>	<u>FAC</u>	<u>10</u>	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Equisetum fluvatile</u>	<u>OBL</u>	<u>80</u>	<u>1</u>
2 <u>Carex utriculata</u>	<u>OBL</u>	<u>20</u>	<u>2</u>
3 <u>Potamogeton natans</u>	<u>OBL</u>	<u>15</u>	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-48 (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:Primary Indicators:

___ Saturated in Upper 12 Inches
☒ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): Aquatic site – no soil pit Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5610-1-veg Looking: _____

Soil Photo #: no photo

(optional) Photo# _____: Explain: _____

Remarks:

New point 5



Emergent and aquatic bed wetland vegetation at site 5610-4

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/29/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5615+00 Plot ID: 5615-1 Cowardin Class: PEM5C/PAB4H

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Alnus viridis ssp. crispa (along edges)</u>	<u>FAC</u>	<u>20</u>	<u>4</u>
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Equisetum fluvatile</u>	<u>OBL</u>	<u>50</u>	<u>1</u>
2 <u>Carex utriculata</u>	<u>OBL</u>	<u>50</u>	<u>2</u>
3 <u>Potamogeton natans</u>	<u>OBL</u>	<u>20</u>	<u>3</u>
4 <u>Nuphar lutea</u>	<u>OBL</u>	<u>10</u>	_____
5 _____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-36 (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:Primary Indicators:

___ Saturated in Upper 12 Inches
X Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): Aquatic site – no soil pit Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5615-1-veg1 and 5615-1-veg2 Looking: _____

Soil Photo #: no photo

(optional) Photo# _____: Explain: _____

Remarks:

New point 4



Emergent wetland vegetation at site 5615-1



Emergent and aquatic bed vegetation at site 5615-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/29/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5620+00 Plot ID: 5620-1 Cowardin Class: PAB4H/PEM5C

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Alnus viridis ssp. crispa (around edges)</u>	<u>FAC</u>	<u>20</u>	<u>4</u>
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Equisetum fluvatile</u>	<u>OBL</u>	<u>30</u>	<u>3</u>
2 <u>Carex utriculata</u>	<u>OBL</u>	<u>60</u>	<u>1</u>
3 <u>Potamogeton natans</u>	<u>OBL</u>	<u>40</u>	<u>2</u>
4 _____	_____	_____	_____
5 _____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-60 (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:Primary Indicators:

___ Saturated in Upper 12 Inches
☒ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): Aquatic site – no soil pit Drainage Class: NA

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? NA
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5620-1-veg Looking: _____

Soil Photo #: no photo

(optional) Photo# _____: Explain: _____

Remarks:

New point 2



Aquatic bed and emergent wetland vegetation at 5620-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/29/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5620+00 Plot ID: 5620-2 Cowardin Class: PAB4H/PEM5C

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Carex aquatilis</u>	<u>OBL</u>	<u>20</u>	<u>3</u>
2 <u>Carex utriculata</u>	<u>OBL</u>	<u>40</u>	<u>2</u>
3 <u>Potamogeton natans</u>	<u>OBL</u>	<u>80</u>	<u>1</u>
4 _____	_____	_____	_____
5 _____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-36 (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:Primary Indicators:

___ Saturated in Upper 12 Inches
☒ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name _____

(Series and Phase): Aquatic site – no soil pit

Drainage Class: NA

Field Observations _____

Taxonomy (Subgroup): _____ Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? NA
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5620-2-veg Looking: _____

Soil Photo #: no photo

(optional) Photo# _____: Explain: _____

Remarks:

New point 3



Aquatic bed and emergent wetland vegetation at site 5620-2

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/29/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5625+00 Plot ID: 5625-1 Cowardin Class: PAB4H/POWH

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Equisetum fluvatile</u>	<u>OBL</u>	<u>60</u>	<u>1</u>
2 <u>Carex utriculata</u>	<u>OBL</u>	<u>20</u>	<u>3</u>
3 <u>Potamogeton natans</u>	<u>OBL</u>	<u>40</u>	<u>2</u>
4 <u>Sparganium hyperboreum</u>	<u>OBL</u>	<u>10</u>	_____
5 _____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominants are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
X Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-60 (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:Primary Indicators:

___ Saturated in Upper 12 Inches
X Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name _____

(Series and Phase): Aquatic site – no soil pit Drainage Class: NA

Field Observations _____

Taxonomy (Subgroup): _____ Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? NA
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5625-1-veg Looking: _____

Soil Photo #: no photo

(optional) Photo# _____: Explain: _____

Remarks:

New point 1, beaver activity and freshwater snails



Open water and emergent wetland vegetation at site 5625-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/26/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5640+00 Plot ID: 5640-1 Cowardin Class: PEM5C/PAB4H

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Equisetum fluvatile</u>	<u>OBL</u>	<u>80</u>	_____	<u>1</u>
2 <u>Sparganium hyperboreum</u>	<u>OBL</u>	<u>40</u>	_____	<u>2</u>
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-24 (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
☒ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): Marsh sediments Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): No soil pit – inundated Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure

Hydric Soil Indicators:

___ Histosol
___ Histic Epipedon
___ Sulfidic Odor
___ Aquic Moisture Regime
___ Reducing Conditions
___ Gleyed or Low-Chroma Colors
___ Concretions
___ High Organic Content in Surface Layer in Sandy Soils
___ Organic Streaking in Sandy Soils
___ Listed on Local Hydric Soils List
___ Listed on National Hydric Soils List
___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5640-1-veg Looking: _____

Soil Photo #: 5640-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

Evidence of beaver activity; GPS pt 88



Emergent and aquatic bed vegetation at 5640-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/26/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5640+00 Plot ID: 5640-2 Cowardin Class: POWH

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Carex aquatilis</u>	<u>OBL</u>	<u>15</u>	_____	<u>1</u>
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-6 ft (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
☒ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
☒ Drainage Patterns in Wetlands: stream nearby

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5640-2-veg Looking: _____

Soil Photo #: 5640-2-soil

(optional) Photo# _____: Explain: _____

Remarks:

No GPS data point



Open water at site 5640-2

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/26/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5655+00 Plot ID: 5655-1 Cowardin Class: PEM5C

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Equisetum fluvatile</u>	<u>OBL</u>	<u>90</u>	_____	<u>1</u>
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-60 (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
☒ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5655-1-veg Looking: _____

Soil Photo #: 5655-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 90, line 91, area of open water



Emergent wetland vegetation at site 5655-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/26/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5660+00 Plot ID: 5660-1 Cowardin Class: PEM1C

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Salix barclayi</u>	<u>FAC</u>	<u>5</u>	_____	_____
2 <u>Alnus viridus ssp. crispa</u>	<u>FAC</u>	<u>2</u>	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Equisetum fluvatile</u>	<u>OBL</u>	<u>60</u>	_____	<u>1</u>
2 <u>Carex utriculata</u>	<u>OBL</u>	<u>40</u>	_____	<u>2</u>
3 <u>Carex saxatilis</u>	<u>OBL</u>	<u>20</u>	_____	<u>4</u>
4 <u>Menyanthes trifoliata</u>	<u>OBL</u>	<u>10</u>	_____	_____
5 <u>Drosera rotundifolia</u>	<u>OBL</u>	<u>30</u>	_____	<u>3</u>

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: 7 (in.)
Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands:

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Fluvaquentic cryofibrist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
1-0	NA	NA	NA	NA	rooted organic
0-2	O	5YR3/3	NA	NA	fibrous
2-5	O	5YR2.5/1	NA	NA	peat
5-8	OA	10YR4/1	NA	NA	sandy silt
8-16	OB	N4	NA	NA	gravel

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
<input checked="" type="checkbox"/> Reducing Conditions	___ Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5650-1-veg Looking: _____

Soil Photo #: 5650-1-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 82, line 83



Emergent wetland vegetation at 5660-1



Gleyed hydric soil at site 5660-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/26/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5660+00 Plot ID: 5660-2 Cowardin Class: PEM5C

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Salix barclayi</u>	<u>FAC</u>	<u>5</u>	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Equisetum fluvatile</u>	<u>OBL</u>	<u>20</u>	_____	<u>2</u>
2 <u>Carex flava</u>	<u>OBL</u>	<u>10</u>	_____	_____
3 <u>Carex echinata ssp. phyllomanica</u>	<u>OBL</u>	<u>20</u>	_____	<u>3</u>
4 <u>Carex pluriflora</u>	<u>OBL</u>	<u>80</u>	_____	<u>1</u>
5 _____	_____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
 ___ Stream, Lake, or Tide Gauge
 X Aerial Photographs
 ___ Other
 ___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-5 (in.)
 Depth to Free Water in Pit: 8 (in.)
 Depth to Saturated Soil: 0 (in.)

Wetland Hydrology Indicators:Primary Indicators:

X Saturated in Upper 12 Inches
X Inundated
 ___ Water Marks
 ___ Drift Lines
 ___ Sediment Deposits
X Drainage Patterns in Wetlands: stream

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
 ___ Water-Stained Leaves
 ___ Local Soil Survey Data
 ___ Local Soil Survey Data
 ___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Fluvaquentic cryofibrist Confirm Mapped Type? No**Profile Description:**

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
3-0	NA	NA	NA	NA	<u>rooted organic</u>
0-3	O	5YR3/3	NA	NA	<u>fibrous</u>
3-6	A	10YR4/1	NA	NA	<u>silty sand</u>
6-16	B	N4	NA	NA	<u>gravel</u>

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
<u>X</u> Reducing Conditions	___ Listed on National Hydric Soils List
<u>X</u> Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes

Wetland Hydrology Present? Yes

Hydric Soils Present? Yes

Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5650-2-veg Looking: _____Soil Photo #: 5650-2-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 85, line 84; small area of standing water



Emergent wetland vegetation at site 5660-2



Gleyed hydric soil at site 5660-2

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/26/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5660+00 Plot ID: 5660-3 Cowardin Class: PEM1C

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Alnus viridis ssp. crispa</u>	<u>FAC</u>	<u>5</u>	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Equisetum fluvatile</u>	<u>OBL</u>	<u>60</u>	_____	<u>1</u>
2 <u>Carex flava</u>	<u>OBL</u>	<u>50</u>	_____	<u>2</u>
3 <u>Carex saxatalis</u>	<u>FACW</u>	<u>5</u>	_____	_____
4 <u>Rubus arcticus</u>	<u>FAC</u>	<u>15</u>	_____	_____
5 <u>Parnassia fimbriata</u>	<u>FACW</u>	<u>10</u>	_____	_____

% of species that are OBL, FACW, and/or FAC: 100% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 100% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: 0-3 (in.)
Depth to Free Water in Pit: 16 (in.)
Depth to Saturated Soil: 1 (in.)

Wetland Hydrology Indicators:

Primary Indicators:

☒ Saturated in Upper 12 Inches
☒ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
☒ Drainage Patterns in Wetlands: stream

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): Fluvaquentic cryofibrist Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
<u>2-0</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>NA</u>	<u>rooted organic</u>
<u>0-6</u>	<u>O</u>	<u>5YR3/3</u>	<u>NA</u>	<u>NA</u>	<u>fibrous</u>
<u>6-10</u>	<u>OA</u>	<u>N4</u>	<u>NA</u>	<u>NA</u>	<u>silt gravel w/ org</u>
<u>10-16</u>	<u>OB</u>	<u>N4</u>	<u>NA</u>	<u>NA</u>	<u>silty gravel</u>
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
<input checked="" type="checkbox"/> Reducing Conditions	___ Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? Yes
Hydric Soils Present? Yes
Is this Sampling Point Within a Wetland? Yes

Vegetation Photo #: 5650-3-veg Looking: _____

Soil Photo #: 5650-3-soil

(optional) Photo# _____: Explain: _____

Remarks:

GPS data point 86, line 87; fish in stream and open water areas that are drying out (sticklebacks?), does not appear to be suited for salmon



Emergent wetland vegetation at site 5660-3



Gleyed hydric soil at site 5660-3

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: aerial photography Weather Conditions: _____

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5910+00 Plot ID: 5910-1 Cowardin Class: R3US1/R3UB1

Do Normal Circumstances exist on the site? Yes No

Is the site significantly disturbed (Atypical Situation)? Yes No

Is the area a potential Problem Area? Yes No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

% of species that are OBL, FACW, and/or FAC: _____ Other indicators: _____

Hydrophytic vegetation?: Yes _____ No _____ Basis: Vegetation similar to 4040-1

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: _____ (in.)
Depth to Free Water in Pit: _____ (in.)
Depth to Saturated Soil: _____ (in.)

Wetland Hydrology Indicators:Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: _____

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes	No (Circle)
Wetland Hydrology Present?	Yes	No
Hydric Soils Present?	Yes	No
Is this Sampling Point Within a Wetland?	Yes	No

Vegetation Photo #: _____ Looking: _____

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:

Davidson Glacier River



Eroding stream banks at site 5910-1



Eroding stream banks at site 5910-1



Eroding stream banks at site 5910-1



Old stream bed at site 5910-1



Stream at site 5910-1, looking northeast



Stream at site 5910-1, looking west



Stream and eroding banks at site 5910-1



Stream and eroding banks at site 5910-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/26/03

Weather Conditions: cloudy

Project: Juneau Access Project – Wetlands Task Investigators: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 5980+00 Plot ID: 5980-1 Cowardin Class: E2EM1N

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____	_____
2 _____	_____	_____	_____	_____
3 _____	_____	_____	_____	_____
4 _____	_____	_____	_____	_____
5 _____	_____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Relative Coverage</u>	<u>Rank</u>
1 <u>Deschampsia cespitosa</u>	<u>FAC</u>	<u>10</u>	_____	_____
2 <u>Poa eminens</u>	<u>FAC</u>	<u>5</u>	_____	_____
3 <u>Carex lyngbyei</u>	<u>OBL</u>	<u>80</u>	_____	<u>1</u>
4 <u>Argentina anserina</u>	<u>FACW</u>	<u>20</u>	_____	<u>3</u>
5 <u>Leymus arenarius</u>	<u>FACU</u>	<u>40</u>	_____	<u>2</u>

% of species that are OBL, FACW, and/or FAC: 67% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 67% of dominant species are hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:

Primary Indicators:

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
☒ Drainage Patterns in Wetlands: stream

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): Tidal flat sediments Drainage Class: poorly drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	Yes
Wetland Hydrology Present?	No
Hydric Soils Present?	No
Is this Sampling Point Within a Wetland?	No

Vegetation Photo #: 5980-1-veg Looking: _____

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:



Estuarine emergent vegetation at site 5980-1

Juneau Access Wetland Determination
(According to the 1987 USACE Wetland Delineation Manual)

Date: 7/27/03 Weather Conditions: sunny

Project: Juneau Access Project – Wetlands Task Investigator: Dave Erikson/Kristin Marsh

Range/Township/Section: _____ Station ID: 6090+00 Plot ID: 6090-1 Cowardin Class: E2BB1N

Do Normal Circumstances exist on the site? Yes

Is the site significantly disturbed (Atypical Situation)? No

Is the area a potential Problem Area? No (If needed, explain on reverse.)

Vegetation (list the three dominant species in each vegetation layer [5 if only 1 or 2 layers]).

Indicate species with observed morphological or known physiological adaptations with an asterisk.

Trees

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Saplings/shrubs

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 _____	_____	_____	_____
2 _____	_____	_____	_____
3 _____	_____	_____	_____
4 _____	_____	_____	_____
5 _____	_____	_____	_____

Herbaceous

<u>Species</u>	<u>Indicator Status</u>	<u>% Coverage</u>	<u>Rank</u>
1 <u>Mertensia maritima</u>	<u>FAC</u>	<u>5</u>	_____
2 <u>Honkenya paploides</u>	<u>OBL</u>	<u>15</u>	_____
3 <u>Leymus arenarius</u>	<u>FACU</u>	<u>30</u>	<u>1</u>
4 <u>Ligusticum scothicum</u>	<u>FAC</u>	<u>10</u>	_____
5 <u>Lathyrus japonicus</u>	<u>FAC</u>	<u>30</u>	<u>2</u>

% of species that are OBL, FACW, and/or FAC: 50% Other indicators: _____

Hydrophytic vegetation?: Yes Basis: 50% hydrophytic vegetation

HYDROLOGY

___ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
☒ Aerial Photographs
___ Other
___ No Recorded Data Available

Field Observations:

Depth of Surface Water: NA (in.)
Depth to Free Water in Pit: NA (in.)
Depth to Saturated Soil: NA (in.)

Wetland Hydrology Indicators:**Primary Indicators:**

___ Saturated in Upper 12 Inches
___ Inundated
___ Water Marks
___ Drift Lines
___ Sediment Deposits
___ Drainage Patterns in Wetlands: _____

Secondary Indicators (2 or more required):

___ Oxidized Root Channels in Upper 12 Inches
___ Water-Stained Leaves
___ Local Soil Survey Data
___ Local Soil Survey Data
___ FAC-Neutral Test

SOILS

Map Unit Name

(Series and Phase): _____ Drainage Class: well drained

Field Observations

Taxonomy (Subgroup): _____ Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color	Mottle Color	Mottle Abundance Size/Contrast	Texture/ Structure
0-16					<u>gravel</u>

Hydric Soil Indicators:

___ Histosol	___ Concretions
___ Histic Epipedon	___ High Organic Content in Surface Layer in Sandy Soils
___ Sulfidic Odor	___ Organic Streaking in Sandy Soils
___ Aquic Moisture Regime	___ Listed on Local Hydric Soils List
___ Reducing Conditions	___ Listed on National Hydric Soils List
___ Gleyed or Low-Chroma Colors	___ Other (Explain in Remarks)

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes
Wetland Hydrology Present? No
Hydric Soils Present? No
Is this Sampling Point Within a Wetland? No

Vegetation Photo #: _____ Looking: _____

Soil Photo #: _____

(optional) Photo# _____: Explain: _____

Remarks:

No GPS points or photos; based on field notes, appears to be apart of a local park

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EAST AND WEST LYNN CANAL

AERIAL INTERPRETATION

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Table C-1
List of Sites Evaluated through Aerial Interpretation

East Lynn Canal		West Lynn Canal	
Wetland ID	Cowardin Classification	Wetland ID	Cowardin Classification
115-1	PFO4B	4135-1	PEM1B
125-1	PFO4B	4150-1	E2RS2N
135-1	PFO4B	4450-1	E2RS2N
150-1	PFO4B	4570-1	E2EM1N
165-1	PFO4B	4570-2	E2EM1N
190-1	PFO4B	4570-3	E2BB1N
195-1	PFO4B	4570-4	E2BB1N
200-1	PFO4B	4570-5	R1USN
235-1	PFO4B	4570-6	R3OWH
265-1	PFO4B	4620-1	E2EM1P
270-1	PEM1B	4820-1	R3US1/R3UB1
275-1	PEM1B	4880-3	PEM1B
325-1	R3UB1H	4880-4	PEM1B
680-3	PSS1S/PFL1S	4880-5	PEM1B/PSS1B
690-1	R1UBV/R1FLR	4940-1	PFO4B
690-2	PSS1R	4940-2	PFO4B
780-1	R1UBV	5300-1	R2UBH
915-1	R2OWH	5430-1	R2UBH
920-1	PEM1B/PSS4B	5560-1	PEM1B
975-1	PEM1B/PSS4B	5570-1	PAB4H
990-1	PSS4B/PEM1B	5570-2	PEM1B
1015-1	PFO4B/PEM1B	5580-1	PEM1B
1020-1	PFO4B/PEM1B	5580-2	PAB4H
1070-1	PFO4B/PEM1B	5595-2	PEM1B
1110-1	PEM1B/PSS4B	5645-1	PFO5Fb
1125-1	PEM1B	5670-1	PFO4B
1135-1	PEM1B/PSS4B	5740-1	R3FLA
1150-1	PEM1B/PSS4B	5870-1	E2BB1P
1185-2	PEM1B	5940-1	E2BB1N
1220-1	PFO4B/PSS1B	6040-1	E2BB1N
1260-2	PEM1B/PSS4B		
1275-1	PFO4B		
1300-1	E2RS2N/E2US1N		
1360-1	PFO4B		
1375-1	PFO4B		
1380-1	E2RS2N/E2US1N		
1480-1	E2RS2N		
2590-1	E2EM1N		
2620-1	R1UBV/R1FLR		
2670-1	E2EM1P		
2690-1	E2EM1P		
2745-1	E2RS2N		
2750-1	E2EM1N		
2765-1	E2RS2N		
2800-1	E2RS2N		
2985-1	E2RS2N		

Table C-1 (continued)
List of Sites Evaluated through Aerial Interpretation

3000-1	E2RS2N	
3000-2	R2USN	
3300-1	E2RS2N	
3560-1	PEM1B	
3565-1	PSS4B	
3580-1	E2RS2N	
3615-3	POWH	
Dewey Creek	R2OWH	

ATTACHMENT D
FUNCTIONS AND VALUES SUMMARY SHEETS

Attachment D: Functions and Values Summary Sheets

EAST LYNN CANAL	D-1
WEST LYNN CANAL	D-85

EAST LYNN CANAL
FUNCTIONS AND VALUES SUMMARY SHEETS

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East Lynn Canal – Sub-region 1

Plot ID: 115-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – muskeg wetland

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: High - Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 125-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – muskeg wetland

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: High - Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 135-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – muskeg wetland

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: High - Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 150-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – muskeg wetland

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: High - Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 165-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – muskeg wetland

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: High - Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 190-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – muskeg wetland

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: High - Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 195-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – muskeg wetland

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: High - Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 200-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – muskeg wetland

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: High - Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 235-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – muskeg wetland

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: High - Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 265-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – muskeg wetland

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: High - Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 340-1

Cowardin Class: PSS1B/PFO4B

Groundwater Recharge: High to Moderate – muskeg wetland

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: High - Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Moderate-High - One of the following communities is present: deciduous woodland, deciduous scrub-shrub

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate-High - Forest occupies 25-50% of the wetland and peat soils are present

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 330-1

Cowardin Class: PFO4B/PSS1B

Groundwater Recharge: High to Moderate – muskeg wetland

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: High - Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Moderate-High - One of the following communities is present: deciduous woodland, deciduous scrub-shrub

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: Moderate-High - Forest occupies 25-50% of the wetland and peat soils are present

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 415-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – muskeg wetland

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: High - Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3%

Sediment or Toxicant Retention: Low - Tidal wetlands and wetlands with >7% slope

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 800-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – muskeg wetland

Groundwater Discharge and Lateral Flow: Low - Wetland is hydrologically isolated from estuaries and streams

Surface Hydrologic Control: Moderate-High - Wetland is nontidal and groundwater discharge = low (i.e., soils not saturated for most of year), an outlet may or may not be present and wetland has peat or other hydric soils and shrubby vegetation and slopes <7%

Sediment or Toxicant Retention: High - Peat soils prevail, much of wetland is in a landscape depression, and slope angle is 0-3%

Nutrient Transformation and Export: Low - Wetland has no surface water outlet (not even intermittent) to the estuary or freshwater body

Riparian Support: Low - Wetland is hydrologically isolated from streams and estuaries

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 800-3

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – muskeg wetland

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 830-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – muskeg wetland

Groundwater Discharge and Lateral Flow: Low - Wetland is hydrologically isolated from estuaries and streams

Surface Hydrologic Control: Moderate-High - Wetland is nontidal and groundwater discharge = low (i.e., soils not saturated for most of year), an outlet may or may not be present and wetland has peat or other hydric soils and shrubby vegetation and slopes <7%

Sediment or Toxicant Retention: High - Peat soils prevail, much of wetland is in a landscape depression, and slope angle is 0-3%

Nutrient Transformation and Export: Low - Wetland has no surface water outlet (not even intermittent) to the estuary or freshwater body

Riparian Support: Low - Wetland is hydrologically isolated from streams and estuaries

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 735-4

Cowardin Class: PFO1A/PSS1A

Groundwater Recharge: High to Moderate – Muskegs wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - One of the following communities is present: deciduous woodland, deciduous scrub-shrub and the wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 680-2

Cowardin Class: PFO1A

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - One of the following communities is present: deciduous woodland, deciduous scrub-shrub and the wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 735-2

Cowardin Class: PEM1S

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: High - Existing survey data indicate that the wetland is frequently used by waterfowl and shorebirds and/or a high number of great blue heron, Vancouver Canada Goose, mallard, or bald eagle relative to other, similar wetlands in the area (Juneau Fish and Wildlife Office and Waterfowl Management – Juneau, USFWS. 2003 Wildlife and Human Use of the Shoreline and Near-shore Waters of Berners Bay, Southeast Alaska, Preliminary Report)

Regional Ecological Diversity: High - The wetland is tidal (estuarine) emergent and directly abuts a nontidal (palustrine) emergent wetland, or is nontidal emergent and abuts a tidal emergent wetland

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 420-1

Cowardin Class: PEM1B/PSS4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-Low - The wetland contains one of the following habitat features: 10 logs, >8 snags, >2 upturned trees (with root wads), largest tree >40 in. dbh, >90% evergreen canopy, >80% deciduous canopy, site dominated by deciduous trees 18-24 ft, at least 3 pools larger than 16 square ft

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 440-1

Cowardin Class: PEM1B/PSS4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-Low - The wetland contains one of the following habitat features: 10 logs, >8 snags, >2 upturned trees (with root wads), largest tree >40 in. dbh, >90% evergreen canopy, >80% deciduous canopy, site dominated by deciduous trees 18-24 ft, at least 3 pools larger than 16 square ft

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 320-1

Cowardin Class: PEM1B/PSS1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Low - Slope is generally >7% or wetland is mostly unvegetated

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - One of the following communities is present: deciduous woodland, deciduous scrub-shrub

Erosion Sensitivity: Moderate-High - Wetland contains slopes of 3-20% and not dominantly forested, and having either a) groundwater discharge conditions, or b) more highly erosive soils (e.g., Kupreanof, Kina, Kogish, Fu, Maybeso)

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 330-2

Cowardin Class: PEM1B/PFO4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Moderate-High - One of the following communities is present: deciduous woodland, deciduous scrub-shrub

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate-High - Forest occupies 25-50% of the wetland and peat soils are present

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 270-1

Cowardin Class: PEM1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 275-1

Cowardin Class: PEM1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 800-2

Cowardin Class: PEM1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 800-4

Cowardin Class: PEM1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: Low - Wetland is hydrologically isolated from estuaries and streams

Surface Hydrologic Control: High - Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3%

Sediment or Toxicant Retention: High - Peat soils prevail, much of wetland is in a landscape depression, and slope angle is 0-3%

Nutrient Transformation and Export: Low - Wetland has no surface water outlet (not even intermittent) to the estuary or freshwater body

Riparian Support: Low - Wetland is hydrologically isolated from streams and estuaries

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 830-2

Cowardin Class: PEM1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: Low - Wetland is hydrologically isolated from estuaries and streams

Surface Hydrologic Control: High - Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3%

Sediment or Toxicant Retention: High - Peat soils prevail, much of wetland is in a landscape depression, and slope angle is 0-3%

Nutrient Transformation and Export: Low - Wetland has no surface water outlet (not even intermittent) to the estuary or freshwater body

Riparian Support: Low - Wetland is hydrologically isolated from streams and estuaries

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 370-T

Cowardin Class: E2RS2N

Groundwater Recharge: Low – Estuarine wetland with substrate of fragipan, bedrock, or marine sediments

Groundwater Discharge and Lateral Flow: Low - Estuarine wetland with substrate of fragipan, bedrock or marine sediments

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Low - Slope is generally >7% or wetland is mostly unvegetated

Nutrient Transformation and Export: Not Applicable

Riparian Support: Not Applicable

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: High - Existing survey data indicate that the wetland is frequently used by waterfowl and shorebirds and/or a high number of great blue heron, Vancouver Canada Goose, mallard, or bald eagle relative to other, similar wetlands in the area

Regional Ecological Diversity: High - This area is important to eulachon, herring, steelhead, Montana Creek chum salmon, Mendenhall sockeye, or Dolly Varden

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 680-3

Cowardin Class: PSS1S/PFL1S

Groundwater Recharge: High to Moderate – Evidence of varying water levels: drift lines, watermarks, etc

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - One of the following communities is present: deciduous woodland, deciduous scrub-shrub

Erosion Sensitivity: Moderate-High - Wetland contains slopes of 3-20% and not dominantly forested, and having either a) groundwater discharge conditions, or b) more highly erosive soils (e.g., Kupreanof, Kina, Kogish, Fu, Maybeso)

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 690-2

Cowardin Class: PSS1R

Groundwater Recharge: High to Moderate – Evidence of varying water levels: drift lines, watermarks, etc

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - One of the following communities is present: deciduous woodland, deciduous scrub-shrub

Erosion Sensitivity: Moderate-High - Wetland contains slopes of 3-20% and not dominantly forested, and having either a) groundwater discharge conditions, or b) more highly erosive soils (e.g., Kupreanof, Kina, Kogish, Fu, Maybeso)

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 1

Plot ID: 735-1

Cowardin Class: E2EM1P

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: High - It is an estuarine emergent wetland

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: High - Existing survey data indicate that the wetland is frequently used by waterfowl and shorebirds and/or a high number of great blue heron, Vancouver Canada Goose, mallard, or bald eagle relative to other, similar wetlands in the area

Regional Ecological Diversity: High - The wetland is tidal (estuarine) emergent and directly abuts a nontidal (palustrine) emergent wetland, or is nontidal emergent and abuts a tidal emergent wetland

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: High - Wetland is an emergent, estuarine wetland

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 990-1

Cowardin Class: PSS4B/PEM1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: High - The wetland contains > 2 contiguous acres of permanent standing fresh or brackish water or permanently flooded fresh emergent marsh (or is within 300 feet of such) and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - Any wetlands not isolated from natural landcover and classified by the NWI classification as having a shrub-scrub component bordering (within 300 ft) of a stream or pond

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 1015-1

Cowardin Class: PFO4B/PEM1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: Moderate-High - Forest occupies 25-50% of the wetland and peat soils are present

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 1020-1

Cowardin Class: PFO4B/PEM1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: Moderate-High - Forest occupies 25-50% of the wetland and peat soils are present

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 895-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Low - Slope is generally >7% or wetland is mostly unvegetated

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 910-2

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – Evidence of varying water levels: drift lines, watermarks, etc.

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: High - Upslope or downslope areas are mostly forested; stream (if any) contains several unshaded reaches

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 955-2

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: High - Wetland is connected by channel flow to a creek or river, and it is large relative to its watershed (5+% by area or smaller)

Riparian Support: High - Upslope or downslope areas are mostly forested; stream (if any) contains several unshaded reaches

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: High - The wetland contains > 2 contiguous acres of permanent standing fresh or brackish water or permanently flooded fresh emergent marsh (or is within 300 feet of such) and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 920-1

Cowardin Class: PEM1B/PSS4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 950-1

Cowardin Class: PEM1B/PSS4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: High - The wetland contains > 2 contiguous acres of permanent standing fresh or brackish water or permanently flooded fresh emergent marsh (or is within 300 feet of such) and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 955-1

Cowardin Class: PEM1B/PSS4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: High - The wetland contains > 2 contiguous acres of permanent standing fresh or brackish water or permanently flooded fresh emergent marsh (or is within 300 feet of such) and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 975-1

Cowardin Class: PEM1B/PSS4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 1010-1

Cowardin Class: PEM1B/PSS4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 1040-1

Cowardin Class: PEM1B/PSS4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Moderate-High - Wetland contains slopes of 3-20% and not dominantly forested, and having either a) groundwater discharge conditions, or b) more highly erosive soils (e.g., Kupreanof, Kina, Kogish, Fu, Maybeso)

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 1185-1

Cowardin Class: PFO4B/PSS1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: High - Wetland is connected by channel flow to a creek or river, and it: has dense emergent and/or woody vegetation

Riparian Support: High - Upslope or downslope areas are mostly forested; stream (if any) contains several unshaded reaches

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 1220-1

Cowardin Class: PFO4B/PEM1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-Low - The wetland contains one of the following habitat features: 10 logs, >8 snags, >2 upturned trees (with root wads), largest tree >40 in. dbh, >90% evergreen canopy, >80% deciduous canopy, site dominated by deciduous trees 18-24 ft, at least 3 pools larger than 16 square ft

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate-High - Forest occupies 25-50% of the wetland and peat soils are present

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 1070-1

Cowardin Class: PFO4B/PEM1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-Low - The wetland contains one of the following habitat features: 10 logs, >8 snags, >2 upturned trees (with root wads), largest tree >40 in. dbh, >90% evergreen canopy, >80% deciduous canopy, site dominated by deciduous trees 18-24 ft, at least 3 pools larger than 16 square ft

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate-High - Forest occupies 25-50% of the wetland and peat soils are present

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 1260-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Low - Slope is generally >7% or wetland is mostly unvegetated

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-Low - The wetland contains one of the following habitat features: 10 logs, >8 snags, >2 upturned trees (with root wads), largest tree >40 in. dbh, >90% evergreen canopy, >80% deciduous canopy, site dominated by deciduous trees 18-24 ft, at least 3 pools larger than 16 square ft,

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 1275-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-Low - The wetland contains one of the following habitat features: 10 logs, >8 snags, >2 upturned trees (with root wads), largest tree >40 in. dbh, >90% evergreen canopy, >80% deciduous canopy, site dominated by deciduous trees 18-24 ft, at least 3 pools larger than 16 square ft,

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 1110-1

Cowardin Class: PEM1B/PSS4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 1135-1

Cowardin Class: PEM1B/PSS4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 1150-1

Cowardin Class: PEM1B/PSS4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 1260-2

Cowardin Class: PEM1B/PSS4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Moderate-High - Wetland contains slopes of 3-20% and not dominantly forested, and having either a) groundwater discharge conditions, or b) more highly erosive soils (e.g., Kupreanof, Kina, Kogish, Fu, Maybeso)

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 1125-1

Cowardin Class: PEM1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 1185-2

Cowardin Class: PEM1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 900-1

Cowardin Class: E2EM1P

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: High - Wetland is connected by channel flow to a creek or river, and it: has dense emergent and/or dense woody vegetation

Riparian Support: High - It is an estuarine emergent wetland

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritima* and existing survey data indicate that the wetland is frequently used by waterfowl and shorebirds and/or a high number of great blue heron, Vancouver Canada Goose, mallard, or bald eagle relative to other, similar wetlands in the area

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), farnorthern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Moderate-Low - Stream has less than 5 conditions a-h in the moderate-high category above, or less than 5 of the following conditions: a) slope angle is less than 60% and appears stable or of bedrock; b) lower banks are predominantly vegetated and there is little or no continuous bank cutting; c) lower banks are comprised of muskeg or grasses or sediments are larger than 2.5 in diameter; d) moderately to well-packed e) stream width/depth ratio < 15 and gradient greater than 5%; f) gravel bars are absent or densely vegetated; g) debris is incorporated into banks or streambed and influence >20% of the channel; h) vegetation comprises dense grass flats or muskeg

Ecological Replacement: High - Wetland is an emergent, estuarine wetland

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 2

Plot ID: 900-T

Cowardin Class: E2BB1N

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritima* and existing survey data indicate that the wetland is frequently used by waterfowl and shorebirds and/or a high number of great blue heron, Vancouver Canada Goose, mallard, or bald eagle relative to other, similar wetlands in the area

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 3

Plot ID: 1360-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Low - Slope is generally >7% or wetland is mostly unvegetated

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-Low - The wetland contains one of the following habitat features: 10 logs, >8 snags, >2 upturned trees (with root wads), largest tree >40 in. dbh, >90% evergreen canopy, >80% deciduous canopy, site dominated by deciduous trees 18-24 ft, at least 3 pools larger than 16 square ft,

Erosion Sensitivity: High - Wetland (regardless of vegetation cover) generally contains slope angles exceeding 20%

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 3

Plot ID: 1375-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Low - Slope is generally >7% or wetland is mostly unvegetated

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-Low - The wetland contains one of the following habitat features: 10 logs, >8 snags, >2 upturned trees (with root wads), largest tree >40 in. dbh, >90% evergreen canopy, >80% deciduous canopy, site dominated by deciduous trees 18-24 ft, at least 3 pools larger than 16 square ft,

Erosion Sensitivity: High - Wetland (regardless of vegetation cover) generally contains slope angles exceeding 20%

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 3

Plot ID: 1300-1

Cowardin Class: E2RS2N/E2US1N

Groundwater Recharge: Low – Estuarine wetland with substrate of fragipan, bedrock, or marine sediments

Groundwater Discharge and Lateral Flow: Low - Estuarine wetland with substrate of fragipan, bedrock or marine sediments

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Low - Slope is generally >7% or wetland is mostly unvegetated

Nutrient Transformation and Export: Not Applicable

Riparian Support: Not Applicable

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - This area is important to eulachon, herring, steelhead, Montana Creek chum salmon, Mendenhall sockeye, or Dolly Varden

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 3

Plot ID: 1380-1

Cowardin Class: E2RS2N/E2US1N

Groundwater Recharge: Low – Estuarine wetland with substrate of fragipan, bedrock, or marine sediments

Groundwater Discharge and Lateral Flow: Low - Estuarine wetland with substrate of fragipan, bedrock or marine sediments

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Low - Slope is generally >7% or wetland is mostly unvegetated

Nutrient Transformation and Export: Not Applicable

Riparian Support: Not Applicable

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - This area is important to eulachon, herring, steelhead, Montana Creek chum salmon, Mendenhall sockeye, or Dolly Varden

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 3

Plot ID: 1480-1

Cowardin Class: E2RS2N

Groundwater Recharge: Low – Estuarine wetland with substrate of fragipan, bedrock, or marine sediments

Groundwater Discharge and Lateral Flow: Low - Estuarine wetland with substrate of fragipan, bedrock or marine sediments

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Low - Slope is generally >7% or wetland is mostly unvegetated

Nutrient Transformation and Export: Not Applicable

Riparian Support: Not Applicable

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - This area is important to eulachon, herring, steelhead, Montana Creek chum salmon, Mendenhall sockeye, or Dolly Varden

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 3

Plot ID: 2590-1

Cowardin Class: E2EM1N

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: High - It is an estuarine emergent wetland

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritima*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: High - Wetland is an emergent, estuarine wetland

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 4

Plot ID: 3565-1

Cowardin Class: PSS4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: Low - Wetland is hydrologically isolated from estuaries and streams

Surface Hydrologic Control: High - Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3%

Sediment or Toxicant Retention: High - Peat soils prevail, much of wetland is in a landscape depression, and slope angle is 0-3%

Nutrient Transformation and Export: Low - Wetland has no surface water outlet (not even intermittent) to the estuary or freshwater body

Riparian Support: Low - Wetland is hydrologically isolated from streams and estuaries

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 4

Plot ID: 3560-1

Cowardin Class: PEM1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: Low - Wetland is hydrologically isolated from estuaries and streams

Surface Hydrologic Control: High - Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3%

Sediment or Toxicant Retention: High - Peat soils prevail, much of wetland is in a landscape depression, and slope angle is 0-3%

Nutrient Transformation and Export: Low - Wetland has no surface water outlet (not even intermittent) to the estuary or freshwater body

Riparian Support: Low - Wetland is hydrologically isolated from streams and estuaries

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 4

Plot ID: 2745-T

Cowardin Class: E2RS2N

Groundwater Recharge: Low – Estuarine wetland with substrate of fragipan, bedrock, or marine sediments

Groundwater Discharge and Lateral Flow: Low - Estuarine wetland with substrate of fragipan, bedrock or marine sediments

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Low - Slope is generally >7% or wetland is mostly unvegetated

Nutrient Transformation and Export: Not Applicable

Riparian Support: Not Applicable

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - This area is important to eulachon, herring, steelhead, Montana Creek chum salmon, Mendenhall sockeye, or Dolly Varden

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 4

Plot ID: 2765-1

Cowardin Class: E2RS2N

Groundwater Recharge: Low – Estuarine wetland with substrate of fragipan, bedrock, or marine sediments

Groundwater Discharge and Lateral Flow: Low - Estuarine wetland with substrate of fragipan, bedrock or marine sediments

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Low - Slope is generally >7% or wetland is mostly unvegetated

Nutrient Transformation and Export: Not Applicable

Riparian Support: Not Applicable

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - This area is important to eulachon, herring, steelhead, Montana Creek chum salmon, Mendenhall sockeye, or Dolly Varden

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 4

Plot ID: 2800-1

Cowardin Class: E2RS2N

Groundwater Recharge: Low – Estuarine wetland with substrate of fragipan, bedrock, or marine sediments

Groundwater Discharge and Lateral Flow: Low - Estuarine wetland with substrate of fragipan, bedrock or marine sediments

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Low - Slope is generally >7% or wetland is mostly unvegetated

Nutrient Transformation and Export: Not Applicable

Riparian Support: Not Applicable

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - This area is important to eulachon, herring, steelhead, Montana Creek chum salmon, Mendenhall sockeye, or Dolly Varden

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 4

Plot ID: 2985-1

Cowardin Class: E2RS2N

Groundwater Recharge: Low – Estuarine wetland with substrate of fragipan, bedrock, or marine sediments

Groundwater Discharge and Lateral Flow: Low - Estuarine wetland with substrate of fragipan, bedrock or marine sediments

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Low - Slope is generally >7% or wetland is mostly unvegetated

Nutrient Transformation and Export: Not Applicable

Riparian Support: Not Applicable

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - This area is important to eulachon, herring, steelhead, Montana Creek chum salmon, Mendenhall sockeye, or Dolly Varden

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 4

Plot ID: 3000-1

Cowardin Class: E2RS2N

Groundwater Recharge: Low – Estuarine wetland with substrate of fragipan, bedrock, or marine sediments

Groundwater Discharge and Lateral Flow: Low - Estuarine wetland with substrate of fragipan, bedrock or marine sediments

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Low - Slope is generally >7% or wetland is mostly unvegetated

Nutrient Transformation and Export: Not Applicable

Riparian Support: Not Applicable

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - This area is important to eulachon, herring, steelhead, Montana Creek chum salmon, Mendenhall sockeye, or Dolly Varden

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 4

Plot ID: 3300-1

Cowardin Class: E2RS2N

Groundwater Recharge: Low – Estuarine wetland with substrate of fragipan, bedrock, or marine sediments

Groundwater Discharge and Lateral Flow: Low - Estuarine wetland with substrate of fragipan, bedrock or marine sediments

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Low - Slope is generally >7% or wetland is mostly unvegetated

Nutrient Transformation and Export: Not Applicable

Riparian Support: Not Applicable

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - This area is important to eulachon, herring, steelhead, Montana Creek chum salmon, Mendenhall sockeye, or Dolly Varden

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 4

Plot ID: 3580-1

Cowardin Class: E2RS2N

Groundwater Recharge: Low – Estuarine wetland with substrate of fragipan, bedrock, or marine sediments

Groundwater Discharge and Lateral Flow: Low - Estuarine wetland with substrate of fragipan, bedrock or marine sediments

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Low - Slope is generally >7% or wetland is mostly unvegetated

Nutrient Transformation and Export: Not Applicable

Riparian Support: Not Applicable

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - This area is important to eulachon, herring, steelhead, Montana Creek chum salmon, Mendenhall sockeye, or Dolly Varden

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: High - Coastal structures may be damaged by tidal action in the absence of estuarine wetlands

East Lynn Canal – Sub-region 4

Plot ID: 2670-1

Cowardin Class: E2EM1P

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: High - Wetland is connected by channel flow to a creek or river, and it: has dense emergent and/or dense woody vegetation

Riparian Support: High - It is an estuarine emergent wetland

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritimus*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), farnorthern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: High - Wetland is an emergent, estuarine wetland

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 4

Plot ID: 2690-1

Cowardin Class: E2EM1P

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: High - Wetland is connected by channel flow to a creek or river, and it: has dense emergent and/or dense woody vegetation

Riparian Support: High - It is an estuarine emergent wetland

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritimus*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: High - Wetland is an emergent, estuarine wetland

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 4

Plot ID: 2630-1

Cowardin Class: E2EM1N

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: High – Wetland is connected by channel flow to a creek or river, and it has dense emergent and/or dense woody vegetation

Riparian Support: High - It is an estuarine emergent wetland

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritima*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: High - Wetland is an emergent, estuarine wetland

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 4

Plot ID: 2735-1

Cowardin Class: E2EM1N

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: High - It is an estuarine emergent wetland

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritima*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: High - Wetland is an emergent, estuarine wetland

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 4

Plot ID: 2750-1

Cowardin Class: E2EM1N

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: High - It is an estuarine emergent wetland

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritima*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: High - Wetland is an emergent, estuarine wetland

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 4

Plot ID: 2735-2

Cowardin Class: E2BB1P

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritima*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 4

Plot ID: 3615-1

Cowardin Class: POWH

Groundwater Recharge: High to Moderate – Topographically perched, inundated but water not stagnant

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: High - Wetland is connected by channel flow to a creek or river, and it: Has deep or open water habitats with low flow velocities

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: High - The wetland contains > 2 contiguous acres of permanent standing fresh or brackish water or permanently flooded fresh emergent marsh (or is within 300 feet of such) and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-Low - Any wetland classified by NWI classification as having a forested component bordering a stream or pond

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: High – Local residents downslope depend on waters for hydroelectricity

East Lynn Canal – Sub-region 4

Plot ID: 3615-2

Cowardin Class: POWH

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: High - Wetland is connected by channel flow to a creek or river, and it: Has deep or open water habitats with low flow velocities

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Moderate-High - Fair habitat for rearing, migration, and/or spawning r

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

East Lynn Canal – Sub-region 4

Plot ID: 3615-3

Cowardin Class: POWH

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: High - Wetland is connected by channel flow to a creek or river, and it: Has deep or open water habitats with low flow velocities

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Moderate-High - Fair habitat for rearing, migration, and/or spawning r

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

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WEST LYNN CANAL
FUNCTIONS AND VALUES SUMMARY SHEETS

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West Lynn Canal – Sub-region 1

Plot ID: 4880-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – Evidence of varying water levels: drift lines, watermarks, etc.

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: High - Wetland is connected by channel flow to a creek or river, and it: Is large relative to its watershed (5+% by area or smaller)

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: High - The wetland contains > 2 contiguous acres of permanent standing fresh or brackish water or permanently flooded fresh emergent marsh (or is within 300 feet of such) and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4040-2

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4410-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4940-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4940-2

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: High - Upslope or downslope areas are mostly forested; stream (if any) contains several unshaded reaches

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4040-1

Cowardin Class: PEM1B/PSS1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: High - Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3%

Sediment or Toxicant Retention: High - Peat soils prevail, much of wetland is in a landscape depression, and slope angle is 0-3%

Nutrient Transformation and Export: Low - Wetland has no surface water outlet (not even intermittent) to the estuary or freshwater body

Riparian Support: Low - Wetland is hydrologically isolated from streams and estuaries

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Moderate-High - One of the following communities is present: deciduous woodland, deciduous scrub-shrub

Erosion Sensitivity: Moderate-High - Wetland contains slopes of 3-20% and not dominantly forested, and having either a) groundwater discharge conditions, or b) more highly erosive soils (e.g., Kupreanof, Kina, Kogish, Fu, Maybeso)

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4880-5

Cowardin Class: PEM1B/PSS1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low- Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: High - Wetland is connected by channel flow to a creek or river, and it has dense emergent and/or dense woody vegetation

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: High - The wetland contains > 2 contiguous acres of permanent standing fresh or brackish water or permanently flooded fresh emergent marsh (or is within 300 feet of such) and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - One of the following communities is present: deciduous woodland, deciduous scrub-shrub

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4135-1

Cowardin Class: PEM1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: High - Wetland has no permanent or tidal outlet (though there may be intermittent outlets which lead to permanent waters) and has a slope angle <3%

Sediment or Toxicant Retention: High - Peat soils prevail, much of wetland is in a landscape depression, and slope angle is 0-3%

Nutrient Transformation and Export: Low - Wetland has no surface water outlet (not even intermittent) to the estuary or freshwater body

Riparian Support: Low - Wetland is hydrologically isolated from streams and estuaries

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Moderate-High - Wetland contains slopes of 3-20% and not dominantly forested, and having either a) groundwater discharge conditions, or b) more highly erosive soils (e.g., Kupreanof, Kina, Kogish, Fu, Maybeso)

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4770-1

Cowardin Class: PEM1B

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: High - Wetland is connected by channel flow to a creek or river, and it: Has dense emergent and/or dense woody vegetation

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Low - Access is restricted and habitat is poor even for resident fish

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritimus*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4770-2

Cowardin Class: PEM1B

Groundwater Recharge: High to Moderate - Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: High - Wetland is connected by channel flow to a creek or river, and it: Has dense emergent and/or dense woody vegetation

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Low - Access is restricted and habitat is poor even for resident fish

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritimus*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4880-3

Cowardin Class: PEM1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low- Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: High - The wetland contains > 2 contiguous acres of permanent standing fresh or brackish water or permanently flooded fresh emergent marsh (or is within 300 feet of such) and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4880-4

Cowardin Class: PEM1B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low- Groundwater discharge is rated Moderate or High and slope <7%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-Low - The wetland contains one of the following habitat features: 10 logs, >8 snags, >2 upturned trees (with root wads), largest tree >40 in. dbh, >90% evergreen canopy, >80% deciduous canopy, site dominated by deciduous trees 18-24 ft, at least 3 pools larger than 16 square ft

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4030-T

Cowardin Class: E2RS2N

Groundwater Recharge: Low – Estuarine wetland with substrate of fragipan, bedrock, or marine sediments

Groundwater Discharge and Lateral Flow: Low - Estuarine wetland with substrate of fragipan, bedrock or marine sediments

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Low - Slope is generally >7% or wetland is mostly unvegetated

Nutrient Transformation and Export: Not Applicable

Riparian Support: Not Applicable

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - This area is important to eulachon, herring, steelhead, Montana Creek chum salmon, Mendenhall sockeye, or Dolly Varden

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4150-1

Cowardin Class: E2RS2N

Groundwater Recharge: Low – Estuarine wetland with substrate of fragipan, bedrock, or marine sediments

Groundwater Discharge and Lateral Flow: Low - Estuarine wetland with substrate of fragipan, bedrock or marine sediments

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Low - Slope is generally >7% or wetland is mostly unvegetated

Nutrient Transformation and Export: Not Applicable

Riparian Support: Not Applicable

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - This area is important to eulachon, herring, steelhead, Montana Creek chum salmon, Mendenhall sockeye, or Dolly Varden

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4450-1

Cowardin Class: E2RS2N

Groundwater Recharge: Low – Estuarine wetland with substrate of fragipan, bedrock, or marine sediments

Groundwater Discharge and Lateral Flow: Low - Estuarine wetland with substrate of fragipan, bedrock or marine sediments

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Low - Slope is generally >7% or wetland is mostly unvegetated

Nutrient Transformation and Export: Not Applicable

Riparian Support: Not Applicable

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - This area is important to eulachon, herring, steelhead, Montana Creek chum salmon, Mendenhall sockeye, or Dolly Varden

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 5485-1

Cowardin Class: E2FL1P

Groundwater Recharge: Low – Estuarine wetland with substrate of fragipan, bedrock, or marine sediments

Groundwater Discharge and Lateral Flow: Low - Estuarine wetland with substrate of fragipan, bedrock or marine sediments

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritima*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4620-1

Cowardin Class: E2EM1P

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: High - It is an estuarine emergent wetland

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritima*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: High - Wetland is an emergent, estuarine wetland

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4900-1

Cowardin Class: E2EM1P

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: High - Wetland is connected by channel flow to a creek or river, and it: Has dense emergent and/or dense woody vegetation

Riparian Support: High - It is an estuarine emergent wetland

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritimus*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), farnorthern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Moderate-High - Stream has 5 or more of the following conditions: a) upper banks exceeding 60% slope or are composed of fine sediments; b) lower banks have continuous bank cutting or cutting at toe of slide areas at meander bends; c) lower banks are composed of sands, silt, clay (<20% gravel); d) streambed composed of sands, silt, clay, fine gravel; e) stream width/depth ratio is >25 and channel is moderately to highly sinuous, gradient <3%; f) gravel or sand bars present, unvegetated, and >3 ft high; g) logs and debris positioned such as to cause scouring and bank cutting; h) alders, devil's club, bare ground, pavement, or open stands of spruce predominated on gentle floodplains

Ecological Replacement: High - Wetland is an emergent, estuarine wetland

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4570-1

Cowardin Class: E2EM1N

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: High - Wetland is connected by channel flow to a creek or river, and it: Has dense emergent and/or dense woody vegetation

Riparian Support: High - It is an estuarine emergent wetland

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritimus*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), farnorthern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Moderate-High - Stream has 5 or more of the following conditions: a) upper banks exceeding 60% slope or are composed of fine sediments; b) lower banks have continuous bank cutting or cutting at toe of slide areas at meander bends; c) lower banks are composed of sands, silt, clay (<20% gravel); d) streambed composed of sands, silt, clay, fine gravel; e) stream width/depth ratio is >25 and channel is moderately to highly sinuous, gradient <3%; f) gravel or sand bars present, unvegetated, and >3 ft high; g) logs and debris positioned such as to cause scouring and bank cutting; h) alders, devil's club, bare ground, pavement, or open stands of spruce predominated on gentle floodplains

Ecological Replacement: High - Wetland is an emergent, estuarine wetland

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4570-2

Cowardin Class: E2EM1N

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: High - Wetland is connected by channel flow to a creek or river, and it: Has dense emergent and/or dense woody vegetation

Riparian Support: High - It is an estuarine emergent wetland

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritimus*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), farnorthern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Moderate-High - Stream has 5 or more of the following conditions: a) upper banks exceeding 60% slope or are composed of fine sediments; b) lower banks have continuous bank cutting or cutting at toe of slide areas at meander bends; c) lower banks are composed of sands, silt, clay (<20% gravel); d) streambed composed of sands, silt, clay, fine gravel; e) stream width/depth ratio is >25 and channel is moderately to highly sinuous, gradient <3%; f) gravel or sand bars present, unvegetated, and >3 ft high; g) logs and debris positioned such as to cause scouring and bank cutting; h) alders, devil's club, bare ground, pavement, or open stands of spruce predominated on gentle floodplains

Ecological Replacement: High - Wetland is an emergent, estuarine wetland

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4570-3

Cowardin Class: E2BB1N

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritima*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 1

Plot ID: 4570-4

Cowardin Class: E2BB1N

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritima*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5645-1

Cowardin Class: PFO5Fb

Groundwater Recharge: High to Moderate – Topographically perched, inundated but water not stagnant and evidence of varying water levels: drift lines, watermarks, etc

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%%

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: High - The wetland contains > 2 contiguous acres of permanent standing fresh or brackish water or permanently flooded fresh emergent marsh (or is within 300 feet of such) and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate - Soil is non-peat and forest vegetation predominates

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5610-1

Cowardin Class: PEM5C/POWH

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: High - The wetland contains > 2 contiguous acres of permanent standing fresh or brackish water or permanently flooded fresh emergent marsh (or is within 300 feet of such) and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), farnorthern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5610-2

Cowardin Class: PEM5C/POWH

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-Low - Any wetland classified by NWI classification as having a forested component bordering a stream or pond

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5565-1

Cowardin Class: PEM5C/PAB4H

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - The wetland is needle-leaved evergreen seasonally flooded scrub-shrub type; needle-leaved evergreen semipermanently flooded scrub-shrub; non-persistent emergent saturated; non-persistent emergent permanently flooded; floating vascular aquatic bed; needle-leaved evergreen seasonally flooded forested

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5565-2

Cowardin Class: PEM5C/PAB4H

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - The wetland is needle-leaved evergreen seasonally flooded scrub-shrub type; needle-leaved evergreen semipermanently flooded scrub-shrub; non-persistent emergent saturated; non-persistent emergent permanently flooded; floating vascular aquatic bed; needle-leaved evergreen seasonally flooded forested

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5610-3

Cowardin Class: PEM5C/PAB4H

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - The wetland is needle-leaved evergreen seasonally flooded scrub-shrub type; needle-leaved evergreen semipermanently flooded scrub-shrub; non-persistent emergent saturated; non-persistent emergent permanently flooded; floating vascular aquatic bed; needle-leaved evergreen seasonally flooded forested

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5610-4

Cowardin Class: PEM5C/PAB4H

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: High - The wetland contains > 2 contiguous acres of permanent standing fresh or brackish water or permanently flooded fresh emergent marsh (or is within 300 feet of such) and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - The wetland is needle-leaved evergreen seasonally flooded scrub-shrub type; needle-leaved evergreen semipermanently flooded scrub-shrub; non-persistent emergent saturated; non-persistent emergent permanently flooded; floating vascular aquatic bed; needle-leaved evergreen seasonally flooded forested

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5615-1

Cowardin Class: PEM5C/PAB4H

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: High - The wetland contains > 2 contiguous acres of permanent standing fresh or brackish water or permanently flooded fresh emergent marsh (or is within 300 feet of such) and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - The wetland is needle-leaved evergreen seasonally flooded scrub-shrub type; needle-leaved evergreen semipermanently flooded scrub-shrub; non-persistent emergent saturated; non-persistent emergent permanently flooded; floating vascular aquatic bed; needle-leaved evergreen seasonally flooded forested

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5640-1

Cowardin Class: PEM5C/PAB4H

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - The wetland is needle-leaved evergreen seasonally flooded scrub-shrub type; needle-leaved evergreen semipermanently flooded scrub-shrub; non-persistent emergent saturated; non-persistent emergent permanently flooded; floating vascular aquatic bed; needle-leaved evergreen seasonally flooded forested

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5655-1

Cowardin Class: PEM5C

Groundwater Recharge: High to Moderate – Topographically perched, inundated but water not stagnant

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5660-2

Cowardin Class: PEM5C

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5600-1

Cowardin Class: PEM5B

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is connected by channel flow to a creek or river, and it: Has dense emergent and/or dense woody vegetation

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5595-1

Cowardin Class: PEM1C/POWH

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), farnorthern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5660-1

Cowardin Class: PEM1C

Groundwater Recharge: High to Moderate – Topographically perched, inundated but water not stagnant

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High y

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Moderate - Soil is peat, and wetland contains exclusively non-forest vegetation

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5560-1

Cowardin Class: PEM1B

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5570-2

Cowardin Class: PEM1B

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5575-1

Cowardin Class: PEM1B

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5580-1

Cowardin Class: PEM1B

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5595-2

Cowardin Class: PEM1B

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-Low - There is no standing water but the wetland contains or abuts a permanent stream, lake, or estuary, or is within 300 feet of such and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5625-1

Cowardin Class: PAB4H/POWH

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: High - Wetland is connected by channel flow to a creek or river, and it: Has deep or open water habitats with low flow velocities

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: High - The wetland contains > 2 contiguous acres of permanent standing fresh or brackish water or permanently flooded fresh emergent marsh (or is within 300 feet of such) and is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - The wetland is needle-leaved evergreen seasonally flooded scrub-shrub type; needle-leaved evergreen semipermanently flooded scrub-shrub; non-persistent emergent saturated; non-persistent emergent permanently flooded; floating vascular aquatic bed; needle-leaved evergreen seasonally flooded forested

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5565-4

Cowardin Class: PAB4H/PEM5C

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - The wetland is needle-leaved evergreen seasonally flooded scrub-shrub type; needle-leaved evergreen semipermanently flooded scrub-shrub; non-persistent emergent saturated; non-persistent emergent permanently flooded; floating vascular aquatic bed; needle-leaved evergreen seasonally flooded forested

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5620-1

Cowardin Class: PAB4H/PEM5C

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - The wetland is needle-leaved evergreen seasonally flooded scrub-shrub type; needle-leaved evergreen semipermanently flooded scrub-shrub; non-persistent emergent saturated; non-persistent emergent permanently flooded; floating vascular aquatic bed; needle-leaved evergreen seasonally flooded forested

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5620-2

Cowardin Class: PAB4H/PEM5C

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - The wetland is needle-leaved evergreen seasonally flooded scrub-shrub type; needle-leaved evergreen semipermanently flooded scrub-shrub; non-persistent emergent saturated; non-persistent emergent permanently flooded; floating vascular aquatic bed; needle-leaved evergreen seasonally flooded forested

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5565-3

Cowardin Class: PAB4H

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - The wetland is needle-leaved evergreen seasonally flooded scrub-shrub type; needle-leaved evergreen semipermanently flooded scrub-shrub; non-persistent emergent saturated; non-persistent emergent permanently flooded; floating vascular aquatic bed; needle-leaved evergreen seasonally flooded forested

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5570-1

Cowardin Class: PAB4H

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - The wetland is needle-leaved evergreen seasonally flooded scrub-shrub type; needle-leaved evergreen semipermanently flooded scrub-shrub; non-persistent emergent saturated; non-persistent emergent permanently flooded; floating vascular aquatic bed; needle-leaved evergreen seasonally flooded forested

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5580-2

Cowardin Class: PAB4H

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - The wetland is needle-leaved evergreen seasonally flooded scrub-shrub type; needle-leaved evergreen semipermanently flooded scrub-shrub; non-persistent emergent saturated; non-persistent emergent permanently flooded; floating vascular aquatic bed; needle-leaved evergreen seasonally flooded forested

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5590-1

Cowardin Class: POWH

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: High - Wetland is connected by channel flow to a creek or river, and it: Has deep or open water habitats with low flow velocities

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 2

Plot ID: 5640-2

Cowardin Class: POWH

Groundwater Recharge: Low – Located at or near sea level, wetland has an outlet, and underlying non-porous substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: High - Wetland is connected by channel flow to a creek or river, and it: Has deep or open water habitats with low flow velocities

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Moderate-High - Any wetlands not isolated from natural landcover and classified by the NWI classification as having a shrub-scrub component bordering (within 300 ft) of a stream or pond

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 3

Plot ID: 5660-3

Cowardin Class: PEM1C

Groundwater Recharge: High to Moderate – Topographically perched, inundated but water not stagnant

Groundwater Discharge and Lateral Flow: High to Moderate - Completely or partly located within 200 feet of stream (discharge)

Surface Hydrologic Control: Moderate-Low - Wetland is usually or mostly nontidal but is within 25 vertical feet of sea level and slope angle is <3%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High y

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Moderate-High - Permanent standing water or permanent emergent freshwater or brackish water marsh is present but is 0.1-1.0 acres in area and the wetlands is adjacent or connected to spruce/hemlock forest, deciduous shrub-scrub (trees < 6m) or, deciduous forest (trees > 6m)

Regional Ecological Diversity: Low - Wetlands not meeting any of the above criteria including those without open water and/or isolated from major forest tracts and without other special features

Erosion Sensitivity: Low - Contains slope angles generally <3%

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 3

Plot ID: 5670-1

Cowardin Class: PFO4B

Groundwater Recharge: High to Moderate – Muskeg wetlands

Groundwater Discharge and Lateral Flow: High to Moderate - Located ~halfway on slope between topo divide and stream (lateral flow)

Surface Hydrologic Control: Moderate-Low - Groundwater discharge is rated Moderate or High and slope <7%%

Sediment or Toxicant Retention: Moderate-Low - Wetland has an outlet, is primarily vegetated and slope is generally <7%, it is not located downstream of potential sediment or toxicant sources

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-Low - Wetland is drained by intermittent streams (excluding artificial ditches) or has a lateral flow or groundwater discharge rating of High

Fish Habitat: Very-Low - No access to any part of the wetland, even during the highest water levels in an average year; or access is purposely excluded (e.g., fish screen)

Wildlife: Low - Wetlands not meeting any of the other criteria

Regional Ecological Diversity: Moderate-High - The wetland contains one of the following habitat features: >20 logs, >15 snags, >4 upturned trees (with root wads), largest tree >45 in. dbh, >98% evergreen canopy, >98% deciduous canopy, site dominated by deciduous trees >24 ft, presence of herbaceous veg >6 ft tall, at least 4 pools larger than 16 square ft

Erosion Sensitivity: Moderate-Low - Wetland contains slope angles of 3-20% and is dominated by forest

Ecological Replacement: High - Forest occupies >50% of the wetland and either, a) peat soils are present or, b) maximum tree diameter is at least 40 dbh

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 3

Plot ID: 5980-1

Cowardin Class: E2EM1N

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: High - It is an estuarine emergent wetland

Fish Habitat: High - NMFS has designated the wetland as essential fish habitat (EFH) for one or more species of fish

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritima*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: High - Wetland is an emergent, estuarine wetland

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 3

Plot ID: 5870-1

Cowardin Class: E2BB1P

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritima*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 3

Plot ID: 5940-1

Cowardin Class: E2BB1N

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritima*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 3

Plot ID: 6040-1

Cowardin Class: E2BB1N

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritima*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: Low - The wetland rating for this function is neither High nor Moderate

West Lynn Canal – Sub-region 3

Plot ID: 6090-1

Cowardin Class: E2BB1N

Groundwater Recharge: High to Moderate – Estuarine wetland with alluvial, gravel or sandy substrate

Groundwater Discharge and Lateral Flow: High to Moderate - Estuarine wetland with alluvial, gravel or sandy substrate (lateral flow)

Surface Hydrologic Control: Low - Tidal wetlands and wetlands with >7% slope

Sediment or Toxicant Retention: Moderate-High - Wetland is tidal or primarily lacustrine or regularly supports beaver

Nutrient Transformation and Export: Moderate - Wetland is mostly vegetated and has an outlet (intermittent or permanent) to the estuary or other freshwater body or directly abuts and runs off into the estuary or other freshwater body, but does not meet the criteria listed for high function

Riparian Support: Moderate-High - Wetland contains, or is neighboring, bordering, or contiguous with (i.e., there is hydrologic and/or habitat connectivity) a mostly permanent stream, lake, or estuary

Fish Habitat: Moderate-Low - Access is restricted* (e.g., obstacle(s) present, very limited frequency and duration of inundation), but habitat is at least fair

Wildlife: High - The wetland contains *Carex lyngbyei*, *Plantago maritima*, *Triglochin maritima*, or *Ruppia maritima*

Regional Ecological Diversity: High - One of the following plant species is present; Lyngbye sedge (*Carex lyngbyei*), smooth sedge (*C. laeviculmis*), Bebb's sedge (*C. bebbii*), Chara (*Chara sp.*), sweet gale (*Myrica gale*), Kamchatka spike-rush (*Eleocharis kamtschatica*), green-keeled cottongrass (*Eriophorum viridicarinatum*), Kamchatka alkali grass (*Puccinellia kamtschatica*), far northern buttercup (*Ranunculus hyperboreus*), ditch grass (*Ruppia maritima*), common eel-grass (*Zostera marina*), narrow-leaved burreed (*Sparganium angustifolium*), marsh cinquefoil (*Comarum palustre*), or Burreed community

Erosion Sensitivity: Low - Contains slope angles generally <3%,

Ecological Replacement: Low - Soil is non-peat, none of the wetland is classified as forested, e.g., many ponds, emergent (minus estuarine), and scrub-shrub wetlands

Downstream/Coastal Beneficiary Sites: High - Coastal structures may be damaged by tidal action in the absence of estuarine wetlands

