ALASKA ENERGY AUTHORITY

ELECTRONICALLY SUBMITTED December 23, 2024

Honorable Debbie-Anne Reese, Secretary
Federal Energy Regulatory Commission
88 First Street, N.E.
Washington, D.C. 20426

RE: Bradley Lake Project FERC Project No. 8221
Dixon Diversion Amendment Terrestrial Study Reports

Dear Secretary Reese:

The Alaska Energy Authority (AEA) is pursuing a Federal Energy Regulatory Commission (FERC) license amendment associated with the existing 120-megawatt Bradley Lake Hydroelectric Project (Bradley Lake Project, FERC No. P-8221). The purpose of the amendment is to gain authorization to increase the Bradley Lake Dam height and divert meltwater from the Dixon Glacier to Bradley Lake to generate additional power. The Bradley Lake Project is located on the Bradley River in the Kenai Peninsula Borough northeast of the town of Homer in Southcentral Alaska. AEA is providing study reports related to terrestrial resources for the proposed license amendment.

On April 27, 2022, AEA initiated the amendment process by filing its Initial Consultation Document. AEA hosted a Joint Agency and Public Meeting in Homer, Alaska on June 14, 2022, and representatives from the U.S. Fish and Wildlife Service (USFWS), National Oceanic and Atmospheric Administration Fisheries, Alaska Department of Fish and Game (ADF&G), Alaska Department of Natural Resources, USFWS Kenai National Wildlife Refuge, and members of the public attended. On November 2, 2022, AEA provided the Draft Study Plan (DSP) for proposed studies and conducted a Study Plan meeting on November 17, 2022, to review the DSP and associated study plan and implementation process schedule. Comments on the DSP were received at the end of December 2022 from ADF&G, USFWS, and Water Policy Consulting, LLC.

On February 5, 2024, AEA filed with FERC and distributed to interested parties a letter providing a revised proposed action and updated process schedule. AEA held public meetings specific to terrestrial resources on March 19, 2024 to review the updated proposed action, stakeholder comments received to the DSP, and proposed modifications to the DSP. Additional consultation was held on April 1, 2024 with the USFWS and ADF&G

and May 7, 2024 with the U.S. Army Corps of Engineers to finalize the study plans.[1] AEA conducted two terrestrial resource-related studies during 2024 in accordance with the DSP and stakeholder comments. Attached herein are the Wetland Delineation Study Report and 2024 Vegetation and Wildlife Habitat Mapping Study Report. Methodologies/requests from stakeholders that were not incorporated in the studies are addressed in the consultation matrix appended to each of the reports.

AEA intends to host a **Terrestrial Resources Meeting in Anchorage, Alaska on January 30 from 9:30 to 11:30 am.** The agenda for the meeting will consist of: (a) a description of the study plans, (b) a review of the data collected in 2024, and (c) a discussion of any anticipated 2025 field efforts.

To assist with meeting planning and logistics, AEA requests that all participants planning to attend the meeting **RSVP to Ryan McLaughlin at rmclaughlin@akenergyauthority.org or by phone at (907) 771-3012 by January 16, 2025**.

AEA appreciates continued stakeholder and agency review and input of the proposed studies associated with the Dixon Diversion amendment to the Bradley Lake Project. Questions regarding this amendment proposal and process schedule can be directed to Bryan Carey, Alaska Energy Authority, at bcarey@akenergyauthority.org.

Sincerely,

ALASKA ENERGY AUTHORITY

Bryan Carey, P.E.
Director of Owned Assets, Alaska Energy Authority

Electronic CC: Distribution List
FERC Docket

[1] According to the Updated Process Schedule provided to FERC and stakeholders on February 5, 2024, the Final Study Plan was to be filed in April 2024; however, this document was not distributed.

2024 Terrestrial Resources Reports

Bradley Lake Hydroelectric Project
FERC No. P-8221

Dixon Diversion Amendment

Prepared for:
Alaska Energy Authority

Prepared by:
Kleinschmidt Associates

December 2024

Kleinschmidt

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ACRONYMS

A

ADF&G	Alaska Department of Fish and Game
AEA	Alaska Energy Authority

B

BLVD	Bradley Lake Vertical Datum

D

DLA	Draft License Application
DAA	Draft Amendment Application
DSP	Draft Study Plan

F

FERC	Federal Energy Regulatory Commission

I

ICD	Initial Consultation Document

M

MOU	Memorandum of Understanding

U

USFWS	United States Fish and Wildlife Service

1.0 INTRODUCTION

The Alaska Energy Authority (AEA), Licensee and owner of the 120-megawatt Bradley Lake Hydroelectric Project (Bradley Lake Project; Federal Energy Regulatory Commission [FERC] No. P-8221), is pursuing a FERC license amendment. The purpose of the proposed amendment is to gain authorization to divert seasonal meltwater coming from Dixon Glacier at the headwaters of the Martin River to the Bradley Lake to increase power production.

AEA filed an Initial Consultation Document (ICD) (Kleinschmidt Associates 2022a) with FERC on April 27, 2022. The ICD describes existing facilities and current Bradley Lake Project operations; characterizes the affected environment; and describes two proposed project alternatives for producing energy from Dixon Glacier meltwater. Following the ICD filing, AEA hosted Joint Agency and Public Meetings in Homer, Alaska on June 14, 2022 to discuss the ICD and receive stakeholder input. In November 2022, AEA filed a Draft Study Plan (DSP) (Kleinschmidt Associates 2022b) with FERC, based on the two alternatives, outlining ten studies; stakeholders filed comments to the DSP in December 2022. AEA received comments from the Alaska Department of Fish and Game (ADF&G), the United States Fish and Wildlife Service (USFWS), and Water Policy Consulting, LLC.

AEA briefly paused the FERC amendment process while it conducted additional feasibility studies during 2023 and narrowed down the proposed project alternatives. Based on further investigations, AEA decided to move forward with the proposed alternative diverting Dixon Glacier meltwater to Bradley Lake (Dixon Diversion Project or Project). AEA re-initiated the license amendment process in 2024 by hosting public meetings in March and April 2024 to review the selected Project alternative, stakeholder comments to the DSP and AEA’s proposed modifications to the DSP. Additional consultation was held on April 1, 2024 with the USFWS and ADF&G and May 7, 2024 with the U.S. Army Corps of Engineers to finalize the terrestrial resources study plans. AEA implemented several studies in 2024.

AEA is submitting the following study reports to describe the results of the terrestrial resources studies conducted in the summer of 2024:

- Wetlands Delineation Study Report (Attachment 1)
- 2024 Vegetation and Wildlife Habitat Mapping Study Report (Attachment 2)

2.0 PROJECT DESCRIPTION

At the time the DSP (Kleinschmidt Associates 2022b) was prepared, AEA was considering two project alternatives: the Dixon-Martin Alternative and the Dixon-Bradley Alternative. Since the DSP, AEA eliminated the Dixon-Martin Alternative from further consideration and selected the Dixon-Bradley Alternative. As described in the DSP, the Dixon-Bradley Alternative included construction of 7.3 miles of new road extending from the existing Upper Battle Creek diversion access road to the proposed Dixon Diversion-Bradley Lake tunnel outlet and up to the proposed Dixon Diversion Dam. AEA has further refined the proposed Project (Figure 2-1) to reduce potential environmental impacts and has eliminated construction of a new access road up to the Dixon Diversion Dam, reducing the amount of new access road proposed to be constructed from 7.3 miles to approximately 1 mile.

As part of the Project, AEA is proposing to raise the Bradley Lake Dam and spillway by 7, 14 or 28 feet from current heights. An increase of 28 feet would increase the normal full pool of Bradley Lake elevation from 1,180 feet up to 1,208 feet, the surface area from 3,820 acres up to 4,224 acres, and the storage capacity from 284,000 acre-feet up to 386,000 acre-feet. The Dixon Diversion structure would be constructed below the toe of the Dixon Glacier at an elevation of approximately 1,275 feet Bradley Lake Vertical Datum (BLVD). Water would be diverted to Bradley Lake via a 4.9-mile-long tunnel bored through the mountain extending from the Dixon Diversion structure. Approximately 1 mile of new, 16-foot-wide, gravel-surfaced access road would be constructed from the existing Upper Battle Creek diversion access road to the outlet of the proposed diversion tunnel. No new overhead transmission is proposed; The additional power generated from the proposed diversion would be transmitted from the existing Bradley Lake powerhouse substation and connect to the Homer Electric Association line between Fritz Creek and Soldotna via the existing 115-kV transmission line.

The entire proposed Project is located on State-owned land. Additional information pertaining to the proposed Dixon to Bradley Lake diversion alternative is provided in the ICD and DSP.

Figure 2-1 Location of the proposed Dixon Diversion Project at the Bradley Lake Hydroelectric Project (FERC No. P-8221) near Kachemak Bay, Alaska.

3.0 PROCESS AND SCHEDULE

Table 3-1 provides the Bradley Lake license amendment schedule for the Dixon Diversion Project. The Stage I portion of the process was concluded with receipt of agency and stakeholder comments on the ICD and study requests.

Table 3-1 Dixon Diversion Project Remaining Process, Plan and Schedule.

Responsible Party	Activity	Dates
Stage 2 Study Planning and Implementation		
AEA	2024 Study Reports	Dec 2024/Jan 2025
Stakeholders	Comments on Study Reports	Feb 2025
AEA/Stakeholders	Pre-Field Season Meeting	Mar 2025
AEA	Conduct 2025 Season Studies Ongoing consultation with Stakeholders	Spring - Fall 2025
AEA/Stakeholders	2025 Field Season Debrief Meeting	Nov/Dec 2025
AEA	2025 Study Reports	Dec 2025
AEA	Draft Amendment Application (DAA)	Jan 2026
FERC/Stakeholders	Comments on DAA	Mar 2026
Stage 3 License Application Filing and FERC Review		
AEA	Final Amendment Application	May 2026

4.0 STATUS OF TERRESTRIAL STUDIES

The DSP identified four terrestrial resources studies. The status of each study is presented below. The study area for all studies was modified to reflect AEA's currently proposed Dixon Diversion Project as described above.

4.1 Wetland Delineation Study

The *Wetland Delineation Study* is considered complete and the study report is provided as Attachment 1 to this document. The wetland delineation data will be used to assess potential impacts to wetlands in the FERC license amendment application, develop avoidance and minimization measures, identify compensatory mitigation requirements, and obtain a USACE Section 404 permit. A functional assessment of jurisdictional wetlands will be completed at the time of Section 404 permitting.

4.1.1 Modifications to the Draft Study Plan

The DSP for the *Wetland Delineation Study* included a wetland functional assessment as a goal of the study with specific objectives of analyzing wetland impacts, obtaining a USACE Section 404 permit for jurisdictional wetlands, and identifying avoidance and minimization measures and compensatory mitigation for jurisdictional wetlands. AEA will assess wetland impacts in the Draft Amendment Application to be filed with FERC. Preliminary avoidance and minimization measures will be considered in the amendment application. These measures as well as compensatory mitigation would be finalized through consultation with USACE during the Section 404 permitting process which would occur after submittal of the amendment application. Based on consultation with USACE, it was determined that the wetland functional assessment would also be completed at the time of Section 404 permitting. Accordingly, these goals and objectives were removed from the study.

4.2 Vegetation and Wildlife Habitat Mapping Study

The study area was defined through consultation with ADF&G and USFWS in the spring of 2024. Consultation was initiated at the March 19, 2024 Terrestrial Resources Meeting. Subsequent to the meeting, ADF&G (2024) and USFWS (2024) provided recommendations for the vegetation and wildlife habitat mapping extent and/or wildlife species to include in the habitat evaluation analysis. A second consultation meeting was held on April 1, 2024 and AEA adopted the recommendations of both agencies. Accordingly, the fine-scale mapping extent for this study encompasses the impact area and a surrounding 250-meter- (820-foot-) wide buffer. In addition, broadscale mapping will be completed in a 2-kilometer- (1.2-mile-) wide area surrounding the proposed diversion tunnel inlet and outlet, new access road and Bradley Lake Dam to account for potential disturbance to certain focal wildlife species during construction.

Preliminary vegetation and wildlife habitat maps were developed for the portion of the study area lying outside of the mainstem Martin River and a field survey was conducted to ground truth the mapping. The results can be found in the *2024 Vegetation and Wildlife Habitat Mapping Study Report* (Attachment 2). The remainder of the study area will be mapped in 2025. Data collected in 2024 will be used to support the expanded mapping areas and habitat change analyses to be completed in 2025.

4.3 Wildlife Habitat Evaluation Study

This study is an office-based effort, to be performed after the Vegetation and Wildlife Habitat Mapping Study for the Dixon Diversion Project area is completed. The first task of this study entails the selection of a set of focal wildlife species through consultation for which Dixon Diversion Project-related habitat impacts will be evaluated. This was completed during 2024.

AEA presented a preliminary list of potential focal species at the March 19, 2024 Terrestrial Resources Meeting to discuss further with stakeholders. Ten mammals and 21 avian species were preliminarily selected if they met one or more of the following criteria:

- A federally- or state-protected species.
- A bird species of conservation and management concern, determined from lists maintained by various management agencies, agency working groups, and non-governmental conservation organizations (as outlined in the FERC–USFWS Memorandum of Understanding [MOU] on migratory birds; FERC and USFWS [2011]).
- A bird or mammal species of management concern for federal and/or state management agencies (primarily game and furbearer species).
- A species that is an important subsistence resource or is culturally significant for Alaska Natives.
- An ecologically important species with demonstrable ecosystem effects, such as ecosystem engineers (e.g., beaver), and species that occupy prominent positions in the trophic structure as predators or prey.

ADF&G recommended the addition of black bear, brown bear, wolverine, hoary marmot and Keen's myotis to the list of species to be evaluated and removal of the Alaska marmot (ADF&G 2024). The USFWS recommended 28 additional bird species and wolverine and tundra vole (USFWS 2024). AEA agreed to include all species recommended by ADF&G and USFWS. The complete list of species to be evaluated in the Wildlife Habitat Evaluation Study is shown in Table 4-1. The analysis and a final report will be developed in 2025.

Table 4-1 Wildlife Species to be included in the Wildlife Habitat Evaluation Study.

Avian Species		
Northern Pintail	Red-tailed Hawk	Kittlitz's Murrelet
Long-tailed Duck	Bald Eagle	Alder Flycatcher
Steller's Eider	Golden Eagle	Olive-sided Flycatcher
Herring Gull	Northern Harrier	Rock Sandpiper
Bonaparte's Gull	Peregrine Falcon	Wilson's Warbler
Black-legged Kittiwake	Short-eared Owl	Orange-crowned Warbler
Arctic tern	Belted Kingfisher	Yellow Warbler
Pelagic Cormorant	Semipalmated Plover	Blackpoll Warbler
Common Goldeneye	Spotted Sandpiper	Fox Sparrow
Barrow's Goldeneye	Greater Yellowlegs	Song Sparrow
Harlequin Duck	Western Sandpiper	Savannah Sparrow
Black Scoter	Lesser Yellowlegs	Bank Swallow
Red-breasted Merganser	Semipalmated Sandpiper	American Pipit
Common Merganser	Short-billed Dowitcher	Horned Lark
Red-throated Loon	Wandering Tattler	Lapland Longspur
Willow Ptarmigan	Marbled Murrelet	Rufous Hummingbird
Rock Ptarmigan		
Mammals		
Keen's Myotis	Dusky shrew	Mountain goat
Little brown bat	American water shrew	River otter
Snowshoe hare	Black bear	American beaver
Singing vole	Brown bear	Hoary Marmot
Tundra Vole	Moose	Wolverine

4.4 Raptor Nesting and Migration

This study has not been initiated. It will be completed during 2025.

5.0 REFERENCES

Alaska Department of Fish and Game (ADF&G). 2024. Alaska Department of Fish and Game's (ADF&G) Recommendations for the Wildlife Habitat Evaluation Study and Vegetation and Wildlife Habitat Change Study for the proposed Dixon Diversion of the Bradley Lake Hydroelectric Project (P-8221). Prepared by Leah Ellis, ADF&G FERC Hydropower Coordinator, Jason Herreman, ADF&G Wildlife Biologist, and Kyle Smith, ADF&G Wildlife Biologist. Submitted to Alaska Energy Authority. March 28, 2024. ADFG Recommended Species List and Habitat Mapping Extent 3/22/24.

FERC and U.S. Fish and Wildlife Service (FERC and USFWS). 2011. Memorandum of Understanding between the Federal Energy Regulatory Commission and the U.S. Department of the Interior United States Fish and Wildlife Service Regarding Implementation of Executive Order 13186, "Responsibilities of Federal Agencies to protect Migratory Birds." March 2011. 13 pp.

Kleinschmidt Associates. 2022a. Initial Consultation Document. Amendment to Bradley Lake Hydroelectric Project (FERC No. 8221), Proposed Dixon Diversion. Prepared for the Alaska Energy Authority. April 27, 2022.

Kleinschmidt Associates. 2022b. Draft Study Plan. Amendment to Bradley Lake Hydroelectric Project (FERC No. 8221), Proposed Dixon Diversion. Prepared for the Alaska Energy Authority. November 2022.

United States Fish and Wildlife Service (USFWS). 2024. DixonSpecies_Final.xls. Prepared by MaryKate Swenarton, Senior Fish and Wildlife Biologist, Anchorage Fish and Wildlife Conservation Office. Submitted to Alaska Energy Authority March 39, 2024. USFWS Dixon Species List Final 3/29/24,

ATTACHMENT 1

WETLAND DELINEATION STUDY REPORT

AMENDMENT TO BRADLEY LAKE HYDROELECTRIC PROJECT (FERC No. 8221), DIXON DIVERSION PROJECT

Wetland Delineation Report

Prepared for:

Alaska Energy Authority
813 West Northern Lights Boulevard
Anchorage, Alaska 99503-2495

Prepared by:

DOWL
5015 Business Park Blvd., Suite 4000
Anchorage, Alaska 99503

December 2024

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ACRONYMS AND ABBREVIATIONS

A

ADF&G	Alaska Department of Fish & Game
AEA	Alaska Energy Authority

D

DOWL	DOWL, LLC
DSP	Draft Study Plan

F

FAC	Facultative
FACU	Facultative Upland
FACW	Facultative Wetland
FERC	Federal Energy Regulatory Commission

G

GIS	Geographic Information System
GHCN	Global Historical Climatology Network

H

HGM	Hydrogeomorphic
HUC	Hydrologic Unit Code

I

ICD	Initial Consultation Document

M

MW	megawatt

N

N/A	Not applicable
NRCS	Natural Resources Conservation Service
NWI	National Wetland Inventory

O

OBL	Obligate
OHW	Ordinary High Water

P

PWS	Professional Wetland Scientist

S

SP	Sampling Point

U

USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1.0 INTRODUCTION

1.1 Background

The Alaska Energy Authority (AEA), Licensee and owner of the 120-megawatt Bradley Lake Hydroelectric Project (Bradley Lake Project; Federal Energy Regulatory Commission [FERC] No. P-8221), is pursuing a FERC license amendment. The purpose of the proposed amendment is to gain authorization to divert storm and seasonal meltwater coming from Dixon Glacier at the headwaters of the Martin River to the Bradley Lake to increase power production.

AEA filed an Initial Consultation Document (ICD) (Kleinschmidt Associates 2022a) with FERC on April 27, 2022. The ICD describes existing facilities and current Bradley Lake Project operations; characterizes the affected environment; and describes two proposed project alternatives for producing energy from Dixon Glacier meltwater. Following the ICD filing, AEA hosted Joint Agency and Public Meetings in Homer, Alaska on June 14, 2022 to discuss the ICD and receive stakeholder input. In November 2022, AEA filed a Draft Study Plan (DSP) (Kleinschmidt Associates 2022b) with FERC, based on the two alternatives, outlining ten studies, including the *Wetland Delineation Study;* Stakeholders filed comments to the DSP in December 2022; no comments were made to the *Wetland Delineation Study*. AEA briefly paused the FERC amendment process while it conducted additional feasibility studies and narrowed down the proposed project alternatives.

Based on further investigations, AEA decided to move forward with the proposed alternative diverting Dixon Glacier meltwater to Bradley Lake (Dixon Diversion Project or Project). The proposed Project would include construction of: a diversion dam near the toe of the Dixon Glacier; an approximately 4.9-mile-long diversion tunnel bored through the mountain extending from Dixon Glacier to Bradley Lake, diverting water from the Martin River basin to Bradley Lake; approximately 1 mile of new, 16-foot-wide, gravel-surfaced access road from the existing Upper Battle Creek diversion access road to the outlet of the proposed diversion tunnel; and modification of the existing Bradley Lake Dam to raise the maximum normal pool elevation currently at 1,180 feet by as much as 7, 14, or 28 feet (1,208 feet elevation). The entire proposed Project is located on State-owned land.

AEA re-initiated the amendment process in 2024 by hosting public meetings in March and April 2024 to review the selected Project alternative, stakeholder comments to the

DSP and AEA's proposed modifications to the DSP. AEA also held a pre-application meeting with the United States Army Corps of Engineers (USACE) in May 2024. Consultation specific to this study can be found in Appendix A.

AEA implemented several studies in 2024. This report describes the results of the *Wetland Delineation Study* completed by DOWL, LLC (DOWL) during 2024 under Section 404 of the Clean Water Act, in accordance with Part IV of the U. USACE Wetland Delineation Manual (USACE 1987), and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region [Version 2.0, (USACE 2007)]. This report provides information for assessing potential impacts to wetlands and for future permitting with USACE for impacts to aquatic resources subject to jurisdiction under Section 404 of the Clean Water Act.

1.2 Modifications to the Draft Study Plan

The DSP for the *Wetland Delineation Study* included a wetland functional assessment as a goal of the study with specific objectives of analyzing wetland impacts, obtaining a USACE Section 404 permit for jurisdictional wetlands, and identifying avoidance and minimization measures and compensatory mitigation for jurisdictional wetlands. AEA will assess wetland impacts in the Draft Amendment Application to be filed with FERC. Preliminary avoidance and minimization measures will be considered in the amendment application. These measures as well as compensatory mitigation would be finalized through consultation with USACE during the Section 404 permitting process which would occur after submittal of the amendment application. Based on consultation with USACE, it was determined that the wetland functional assessment would also be completed at the time of Section 404 permitting (Appendix A). Accordingly, these goals and objectives were removed from the study.

2.0 GOALS AND OBJECTIVES

The goal of the wetland delineation study is to identify wetlands and waterbody extents potentially impacted by the proposed Dixon Diversion Project.

The specific objective of the study is to:

- Delineate wetlands into distinct polygons based on Cowardin Classification (Subclass designation) (Cowardin et al. 1979), Viereck Class IV vegetation types (Viereck et al. 1992), and hydrogeomorphic classes to provide acreages.

The results of this study will provide information for AEA to assess potential impacts to wetlands, develop avoidance and minimization measures, identify USACE Section 404 jurisdictional wetlands and determine compensatory mitigation requirements consistent with Section 404(b)(1) guidelines, if necessary, and obtain a USACE permit. Based on direction provided by USACE during the May 7, 2024 pre-application meeting (Appendix A), AEA will complete a functional assessment of the jurisdictional wetlands at the time of permitting.

3.0 STUDY AREA

The study area consists of the project footprint with buffers as follows:

- 1-mile-long new access road: 80-foot buffer around centerline;
- Dixon Diversion tunnel: 100-foot buffer around inlet and outlet;
- Bradley Lake Dam: 250-foot buffer around the dam site; and
- Bradley Lake pool raise area: area between elevations 1,180 and 1,208 feet around Bradley Lake.

The total study area evaluated for wetlands and aquatic resources is 456.4 acres (Appendix B: Figure 1). The study area is within the Township, Range, and Sections in the Seward Meridian listed in Table 3-1.

Table 3-1 Location information.

Township	Range	Sections
5 South	10 West	36
5 South	9 West	8, 9, 10, 11, 14, 15, 16, 17, 22, 23, 24, 25, 26, 36
5 South	8 West	19, 20, 29, 30, 31
6 South	10 West	1

The study area is within the Alaska Pacific Coastal Mountains ecoregion. The Alaska Pacific Coastal Mountains ecoregion has steep terrain with most of the gradients exceeding 7 degrees. This ecoregion was heavily glaciated during the Pleistocene epoch, with active glaciers in higher elevations. The study area is near the southern boundary of the Cook Inlet ecoregion with similar characteristics. Dwarf and low scrub species dominate the region as slopes are typically barren to sparsely vegetated, while lower elevations near drainage systems consist of needleleaf forests and dense thickets of low scrub communities (Gallant 1995). The annual growing season spans from May 29 to September 27 (USACE 2007). Most of the soils in the ecoregion are covered by glaciers, ice fields, or rock outcrops with the developed soil formed in gravelly till and colluvium.

Bradley Lake is connected to Kachemak Bay with headwaters from Kachemak and Nuka glaciers. Streams connected to Bradley Lake include many small, high gradient streams and two major tributary streams. Meltwater from the Dixon Glacier terminus, where the tunnel intake starts, flows to the Martin River that is connected to Kachemak Bay southwest from where the Bradley River connects to the bay.

Uplands within the study area consist of a steep hillside surrounding Bradley Lake, areas of glacial outwash and stream deposits, and previously disturbed and filled access roads and infrastructure.

4.0 METHODS AND DATA SOURCES

4.1 Precipitation

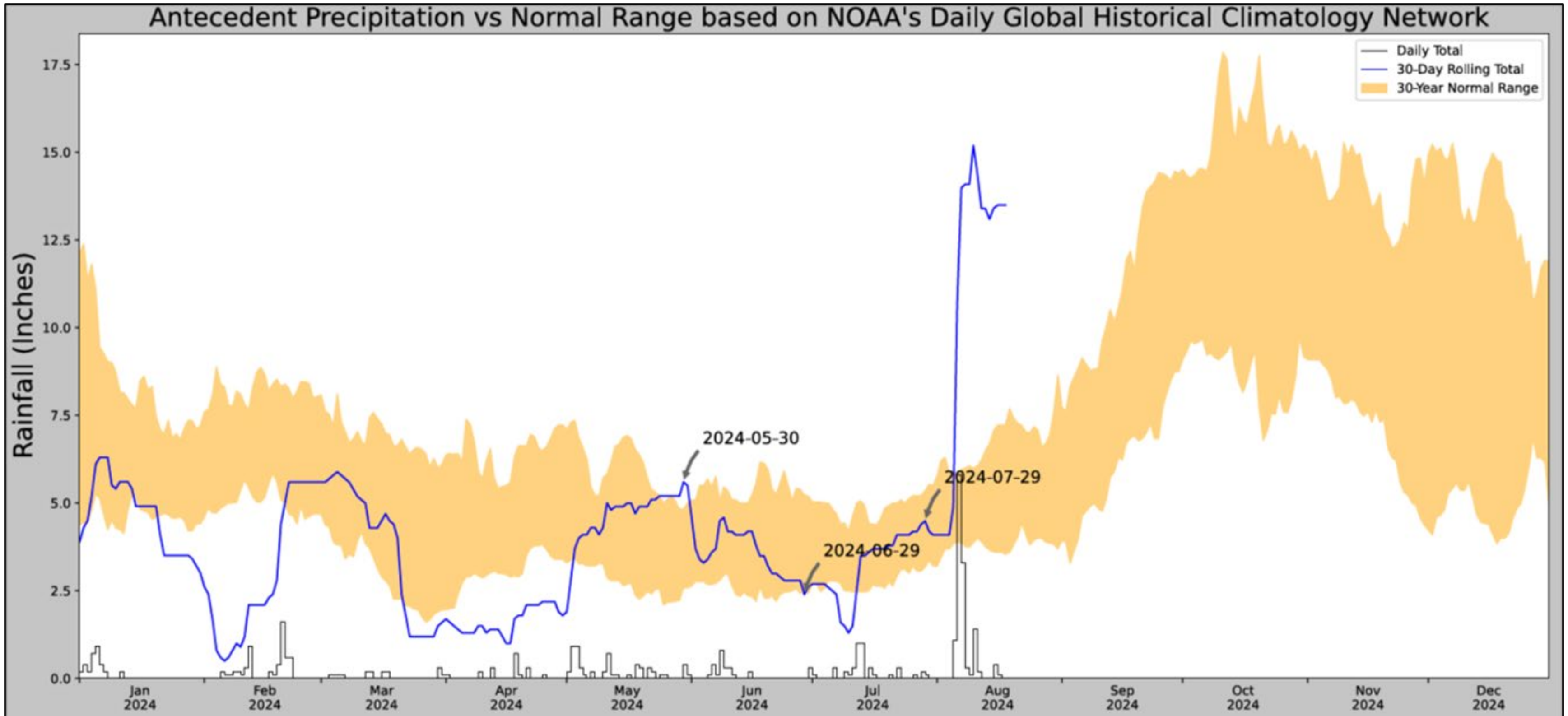
The Antecedent Precipitation Tool Version 2.0 was used to determine precipitation conditions using the Nuka Glacier, Middle Fork Bradley, and Homer weather station data from National Oceanic and Atmospheric Administration's Daily Global Historical Climatology Network (GHCN) (Figure 4-1). Daily precipitation values over a 30-day rolling cycle were averaged for the three-months preceding the field delineation activities to determine if observation of surface hydrology or soil moisture conditions were expected to be drier than normal, normal, or wetter than normal. Fieldwork was conducted July 29 to August 2, 2024, during the dry season for the region.

For the three months preceding fieldwork, precipitation observations were considered normal within the study area. Wetland formation is driven by the frequency and duration of hydrology sources through precipitation, groundwater, stream/pond, or a combination of each. Based on the area receiving normal precipitation, it is anticipated wetlands formed with dominant water source of groundwater and/or precipitation would have primary hydrologic indicators present during data collection activities. The amount of precipitation the week and days prior to fieldwork influences precipitation driven wetlands (e.g., ponding). Field observations may observe a dry season water table between 12 and 24 inches for a mineral soil and between 12 and 40 inches for an organic soil.

The study area normally receives up to 5.3 inches of rainfall during the month of July. In July 2024, the study area received 4.5 inches of rainfall. June precipitation was drier than normal, while May precipitation was wetter than normal.

4.2 Surface Hydrology

The Project will modify wetlands in three contiguous Hydrologic Unit Code (HUC)12 watersheds: Martin River (190203011104), Battle Creek (190203011103), and Bradley Lake (190203011101) watersheds. These HUC12 watersheds make up about 25 percent of the larger Quiet Creek-Frontal Kachemak Bay HUC10 (1902030111) watershed at the headwaters of Kachemak Bay. The U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) wetland mapper shows that the study area drains into estuarine and marine wetlands (E2USN) on the coast of Kachemak Bay (USFWS 2024).



Coordinates	59.745633, -150.834833
Observation Date	2024-07-29
Elevation (ft)	1263.719
Drought Index (PDSI)	Not available
WebWIMP H_2O Balance	Dry Season

30 Days Ending	30th %ile (in)	70th %ile (in)	Observed (in)	Wetness Condition	Condition Value	Month Weight	Product
2024-07-29	3.170473	5.349606	4.488189	Normal	2	3	6
2024-06-29	2.524016	5.226772	2.393701	Dry	1	2	2
2024-05-30	2.586614	4.825984	5.598425	Wet	3	1	3
Result							Normal Conditions - 11

US Army Corps of Engineers

ERDC

Figures and tables made by the Antecedent Precipitation Tool Version 2.0

Developed by: U.S. Army Corps of Engineers and U.S. Army Engineer Research and Development Center

Weather Station Name	Coordinates	Elevation (ft)	Distance (mi)	Elevation Δ	Weighted Δ	Days Normal	Days Antecedent
Nuka Glacier	59.7, -150.71	1250.0	5.371	13.719	2.491	10475	90
Middle Fork Bradley	59.78, -150.76	2299.869	5.795	1049.869	8.692	370	0
HOMER 8 NW	59.7444, -151.6347	1080.053	32.359	169.947	20.061	507	0

Figure 4-1 Nuka Glacier, Middle Fork Bradley, and Homer. National Oceanic and Atmospheric Administration daily GHCN 2024 precipitation data.

4.3 National Wetland Inventory

USFWS NWI existing wetland mapping data (USFWS 2023) was reviewed to establish a coarse wetland mapping baseline. The USFWS NWI dataset describes the extent and type of wetlands and waters of the U.S. in the study area (scale 1:24,000). The mapped extents are shown in Appendix B: Figure 2.1 through Figure 2.12. The NWI mapping identified 2.8 acres of lacustrine, 2.1 acres of palustrine, and 114.7 acres of riverine wetlands in the study area (Table 4-1).

Table 4-1 National Wetlands Inventory acres in the study area by Cowardin Classification.

Cowardin Classification	Acres	Percent of Study Area
Lacustrine	2.8	0.6
Palustrine	2.1	0.5
Riverine	114.7	25.1
Subtotal	**119.6**	**26.2**

4.4 Soil Type Data

Natural Resources Conservation Service (NRCS) Web Soil Survey data (NRCS 2024) is listed below and described in Table 4-2 as a percentage of the study area. Four soil types are mapped in the study area, with no hydric soil conditions (Appendix B: Figures 3.1-3.12).

Table 4-2 Natural Resources Conservation Service soil types in study area.

Map Unit Name	Percent of Study Area
No Information	95%
Lithic Haplocryands-Alic Haplocryands-Rock outcrop complex, 25 to 45 percent slopes	0.3%
Lithic Haplocryands-Alic Haplocryands-Rock outcrop complex, 45 to 100 percent slopes	0.6%
Tutka-Kasitsna-Rock outcrop complex, very steep	1.8%
Urban land	1.3%
Water, fresh	0.9%

4.5 Other Data Sources

Data from the following sources were also reviewed:

- Aerial Imagery: ESRI World Imagery (July 2022) was used for wetland mapping. Other available aerial imagery from Google Earth taken in 2003, 2005, 2017, and 2021 were referenced for changes in vegetation signature.
- U.S. Geological Service (USGS) Hydrography Datasets: The National Hydrography Dataset identified 10,281.2 linear feet of streams within the study area (Appendix B: Figures 2.1-2.12) (USGS 2024).
- Alaska Department of Fish & Game (ADF&G) Anadromous Waters Catalog: No streams are mapped within the anadromous waters catalog within the study area (ADF&G 2024).

4.6 Field Data Collection and Wetland Mapping

DOWL Environmental Specialists Josh Grabel, PWS #2638 and Emily Anderson conducted the wetland delineation fieldwork on July 29 through August 2, 2024 in accordance with Part IV of the Corps of Engineers Wetlands Delineation Manual (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region [Version 2.0, (USACE 2007)]. Wetlands were classified and grouped according to guidelines outlined in the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979) and Hydrogeomorphic Classification for Wetlands (Brinson 1993).

Data was collected at sampling points using the three-parameter approach combining site-specific indicators of hydrophytic vegetation, hydric soils, and wetland hydrology. Field notes were taken to document landscape topography, and general site characteristics. At each sampling point, soil pits were excavated to a depth of at least 24 inches, or to the presence of a restrictive digging layer. Soil and hydrology characteristics of texture, color, saturation, and depth to water table were recorded on USACE Routine Wetland Determination forms (Appendix C). Soil color was recorded using Munsell Soil-Color Charts (Munsell Color 2012). Data reported for sampling points are prefixed with "SP." Additionally, photo points were taken to document site conditions, confirm dominant plant species, extrapolate data to similar habitat areas, or to make a wetland/upland determination when soil excavation was not necessary (Appendix C). Photo point locations are prefixed with "PP."

The following references were used to assist with field identification of dominant vegetative species:

- Alaska Trees and Shrubs (Viereck et al. 2007)
- Plants of the Pacific Northwest Coast: Washington, Oregon, British Columbia & Alaska (Pojar and MacKinnon 2016)
- Alpine Plants of the Northwest: Wyoming to Alaska (Pojar and MacKinnon 2013)
- Field Guide to Alaskan Wildflowers (Pratt 1990)
- Wetland Sedges of Alaska (Tande et al. 2003)
- Willows of Southcentral Alaska (Collet 2002)
- 2022 National Wetland Plant List version 3.6-Alaska Region

An Apple iPad tablet with ESRI Arc Collector Global Positioning System with 15-feet accuracy was used to collect spatial location field data. ESRI ArcMap was used to delineate wetland/upland boundaries and calculate acreages. Final mapping was based on interpretation of aerial and site photos, topographic data, and field observations.

5.0 RESULTS

5.1 Study Area Characteristics

The study area contains approximately 4.0 acres of wetlands (0.9 percent), 154.3 acres of waters (33.8 percent), primarily comprised of riverine (147.4 acres), followed by lake (4.8 acres) and pond (2.1 acres) water types, and approximately 298.1 of uplands (65.3 percent). Results of the field investigation are discussed below. Data sheets for sampling points and photo points are in Appendix C.

All dominant plant species observed in the study area are listed in Table 5-1 and all plant species observed in the field are included in Appendix C.

Table 5-1 Dominant plant species observed in study area.

Scientific Name	Common Name	Indicator Status
Achillea millefolium	common yarrow	FACU
Aconitum delphiniifolium	larkspur-leaf monkshood	FAC
Alnus incana	speckled alder	FAC
Alnus viridis	Sitka alder	FAC
Artemisia tilesii	Tilesius' wormwood	FACU
Calamagrostis canadensis	Bluejoint	FAC
Carex aquatilis	Leafy tussock sedge	OBL
Carex macrochaeta	Alaska long-awn sedge	FACW
Carex microchaeta	Alpine-tundra sedge	FAC
Chamaenerion angustifolium	Narrow-leaf fireweed	FACU
Empetrum nigrum	Black crowberry	FAC
Epilobium palustre	Marsh willowherb	OBL
Eriophorum angustifolium	Tall cotton-grass	OBL
Eriophorum vaginatum	Tussock cotton-grass	FACW
Eurybia sibirica	Siberian wood-aster	FAC
Lupinus arcticus	Arctic lupine	FACU
Maianthemum dilatatum	Two-leaf false Solomon's-seal	FAC
Oplopanax horridus	Devil's-club	FACU
Poa pratensis	Kentucky blue grass	FACU
Pyrola asarifolia	Pink wintergreen	FACU
Rubus arcticus	Northern blackberry	FAC
Rubus pedatus	Strawberry-leaf raspberry	FAC
Salix alaxensis	Felt-leaf willow	FAC

Scientific Name	Common Name	Indicator Status
Salix barclayi	Barclay's willow	FAC
Salix pulchra	Diamond-leaf willow	FACW
Salix sitchensis	Sitka willow	FAC
Sanguisorba canadensis	Canadian burnet	FACW
Sedum lanceolatum	Spearleaf stonecrop	UPL
Spiraea stevenii	Steven's meadowsweet	FACU
Trichophorum caespitosum	Tufted leafless-bulrush	OBL
Trientalis europaea	Arctic starflower	FACU
Vaccinium uliginosum	Alpine blueberry	FAC
Vaccinium vitis-idaea	Northern mountain-cranberry	FAC
Veratrum viride	American false hellebore	FAC
Viola palustris	Alpine-marsh violet	FACW

Notes: FAC = Facultative; FACU = Facultative Upland; FACW = Facultative Wetland; OBL = Obligate; UPL = Upland.

5.1.1 Wetlands

Study area wetlands consist of the following dominant vegetation: speckled alder (*Alnus incana*), Sitka alder (*A. viridis*), bluejoint (*Calamagrostis canadensis*), leafy tussock sedge (*Carex aquatilis*), Alaska long-awn sedge (*C. macrochaeta*), alpine-tundra sedge (*C. macrochaeta*), narrow-leaf fireweed (*Chamaenerion angustifolium*), black crowberry (*Empetrum nigrum)*, marsh willowherb (*Epilobium palustre*), tall cotton-grass (*Eriophorum angustifolium*), tussock cotton-grass (*E. vaginatum*), strawberry-leaf raspberry (*Rubus pedatus*), felt-leaf willow (*Salix alaxensis*), diamond-leaf willow (*S. pulchra*), Sitka willow (*S. barclayi*), Canadian burnet (*Sanguisorba canadensis*), Arctic starflower (*Trientalis europaea*), alpine blueberry (*Vaccinium uliginosum*), and alpine-marsh violet (*Viola palustris*). Hydrophytic vegetation met dominance and/or prevalence index indicators. Typical wetlands within the study area are shown in Photo 5-1.

Photo 5-1 Typical wetlands within the study area (SP17).

Hydrologic indicators consisted of high-water table, soil saturation, dry season water table, algal mat, inundation visible on aerial imagery, water-stained leaves, drainage patterns, presence of reduced iron, geomorphic position, microtopographic relief, and passing the FAC-neutral test. The most common primary indicators were high water table and soil saturation. Typical wetlands soil and hydrology (soil saturation, dry season water table) in the study area are shown in Photo 5-2.

Photo 5-2 Typical wetland soils within the study area (SP7).

In general, soils in wetlands had a thick organic layer and met Histosol or Histic Epipedon. Soils without a thick organic layer but considered hydric soil based on best professional judgment include SP5 and SP11. SP5 contained gravelly soils with low organic-carbon content. SP11 contained problematic hydric soils within a stream channel with drift deposits, geomorphic position, FAC-neutral, and hydrophytic vegetation. Table 5-2 lists soil characteristics observed at sampling points.

Table 5-2 Soil observations at sampling point within the study area.

Sampling Point	Organic Mat Thickness (inches)	Hydric Soil
SP1	3	No
SP2	4	No
SP3	2	No
SP4	3	No
SP5	4	Yes, Problematic gravelly soils
SP6	3	No
SP7	18	Yes, Histosol
SP8	8	Yes, Histic Epipedon
SP9	5	No
SP10	1	No
SP11	0	Yes, problematic sandy soils in stream channel
SP12	5	No
SP13	5	No
SP14	4	No
SP15	20	Yes, Histosol
SP16	4	No
SP17	11	Yes, Histic Epipedon
SP18	6	No
SP19	4	No
SP20	1	No
SP21	2	No

5.1.2 Streams

Two major tributary streams discharge into the eastern extent of Bradley Lake. Along the steep slopes of the Bradley Lake shoreline, several small, high gradient streams flow to Bradley Lake. Bradley Lake discharges to the Bradley River. Meltwater from the Dixon Glacier terminus at the tunnel intake flows to the Martin River. Both the Bradley River and the Martin River flow to Kachemak Bay, a traditional navigable water.

The major tributaries (Nuka River, Kachemak Creek) that discharge into Bradley Lake are braided streams with multi-threaded channels consisting of vegetated or non-vegetated areas that seasonally flood during high water and have dynamic channels with large sediment movement. In braided streams, the outer channel banks and everything in between are considered the extent of the Riverine System (Federal Geographic Data Committee 2013). The Ordinary High Water (OHW) of the outermost channels in the braided streams were considered the base elevation for stream classification. One of the braided tributaries feeding Bradley Lake contained two islands with elevations above the OHW. Any vegetated areas below the OHW elevation within the stream braids were considered stream channel and not wetlands. No mineral or organic soils were present in these areas. Signs of hydrology flow through these areas included drift deposits and shrubs stripped of leaves from recent flow events. A typical stream within the study area is shown in Photo 5-3.

Photo 5-3 Typical stream within the study area (Photo Point 43).

5.1.3 Uplands

Study area uplands consist of the following dominant vegetation: common yarrow (*Achillea millefolium*), larkspur-leaf monkshood (*Aconitum delphiniifolium*), speckled alder, Sitka alder, Tilesius' wormwood (*Artemisia tilesii*), bluejoint, narrow-leaf fireweed, black crowberry, Siberian wood-aster (*Eurybia sibirica*), Arctic lupine (*Lupinus arcticus*), two-leaf false Solomon's-seal (*Maianthemum dilatatum*), devil's-club (*Oplopanax horridus*), Kentucky blue grass (*Poa pratensis*), pink wintergreen (*Pyrola asarifolia*), northern blackberry (*Rubus arcticus*), strawberry-leaf raspberry *(R. pedatus)*, diamond-leaf willow, Sitka willow, spearleaf stonecrop (*Sedum lanceolatum*), Steven's meadowsweet (*Spiraea stevenii*), tufted leafless-bulrush (*Trichophorum caespitosum*), Arctic starflower, northern mountain-cranberry (*V. vitis-idaea*), and American false hellebore (*Veratrum viride*). Typical uplands within the study area are shown in Photo 5-4. Typical upland soil and lack of hydrologic indicators are shown in Photo 5-5.

Photo 5-4 Typical uplands within the study area (SP12).

Photo 5-5 Typical upland soil with lack of hydrologic indicators (SP9).

Uplands typically meet the dominance or prevalence index indicators of hydrophytic vegetation. However, usually no primary hydrologic indicators were observed, and no hydric soil indicators were met. Upland sampling points matched NRCS upland soil mapping.

5.2 Study Area Summary

Data was collected at 85 photo points and 21 sampling points, as listed in Table 5-3 and Appendix B: Figure 4.1 through Figure 4.31.

Table 5-3 Study area results by Cowardin Classification.

Cowardin	Wildlife Habitat[1]	Viereck Class IV[1]	Acres	Sampling Points (SP)	Photo Points
PEM1C	Riverine Low and Tall Willow, Subalpine and Alpine Dwarf Ericaceous Scrub, Upland and Subalpine Tall Alder Scrub	Dwarf Ericaceous Shrub Tundra, Low Open Willow Shrub, Tall Closed Alder Shrub	0.3	N/A	11, 62, 77
PSS1/EM1C	Riverine Low and Tall Willow	Low Closed Willow Shrub	1.8	15	53, 55, 57
PSS1B	Subalpine and Alpine Dwarf Ericaceous Scrub, Glaciated Subalpine Rock-Shrub Scrub-Meadow Complex	Dwarf Ericaceous Shrub Tundra	0.7	8 & 17	N/A
PSS1C	Riverine Low and Tall Willow, Glaciated Subalpine Rock-Shrub Scrub-Meadow Complex	Low Open Willow Shrub	1.2	5 & 7	27, 32, 33, 70
PUBH	Ponds	Water	2.1	N/A	26
R3UBC	Riverine Barrens, Riverine Low and Tall Willow	Low Open Willow Shrub	24.7	11	36, 37, 39, 41, 42, 44, 45, 48, 66, 69, 80, 82
R3UBH	Riverine Barrens, Riverine Low and Tall Willow, Upland and Subalpine Tall Alder Scrub, Rivers and Streams (high gradient-high flow)	Low Open Willow Shrub, Tall Closed Alder Shrub	122.5	N/A	43, 46, 47, 49-52, 79
R4SBC	Riverine Low and Tall Willow	Low Open Willow Shrub	0.2	N/A	24, 78, 81
L1UBH	Lake	Water	0.2		21
L2UBH	Lake	Water	4.7		21

Cowardin	Wildlife Habitat[1]	Viereck Class IV[1]	Acres	Sampling Points (SP)	Photo Points
U	Artificial Fill, Riverine Low and Tall Willow, Rocky Cliffs, Rocky Shore and Cobble Beach, Glaciated Subalpine Rock-Shrub Scrub-Meadow Complex Subalpine and Alpine Barrens, Subalpine and Alpine Dwarf Ericaceous Scrub, Upland and Subalpine Tall Alder Scrub	Barrens, Dwarf Ericaceous Shrub Tundra, Low Open Willow Shrub, Tall Closed Alder Shrub	298.1	1-4, 6, 9, 12, 13, 14, 16, 18-21	1-10, 14, 16-20, 22-25, 28-38, 56, 58, 60, 61, 63, 65, 67, 68, 71-76, 83, 85

[1]ABR Habitat and Viereck Classification Data. 2024. Vegetation mapping conducted at 1:5,000 scale with wetlands as a subset of the habitats listed.

NWI mapping identified 119.6 acres of riverine, palustrine, and lacustrine wetlands, and Kenai Watershed Forum mapping is not present in the study area (Table 5-4). DOWL mapping identified more acres of wetlands and waters within the study area.

Table 5-4 Study areas – results comparison.

	DOWL Mapping Data		NWI Data	
Cowardin	**Acres**	**Percent of Study Area**	**Acres**	**Percent of Study Area**
PEM1C	0.3	0.1	-	-
PSS1/EM1C	1.8	0.4	-	-
PSS1A	-	-	0.4	0.1
PSS1B	0.7	0.2	-	-
PSS1C	1.2	0.3	-	-
PUBH	2.1	0.5	1.8	0.4
R3UBC	24.7	5.4	-	-
R3UBH	122.5	26.8	3.5	0.8
R3USC	-	-	109.5	24.0
R4SBC	0.2	0.2	-	-
R5UBH	-	-	1.7	0.4
L1UBH	0.2	<0.1	2.8	0.6
L2UBH	4.7	1.0	-	-
TOTAL*	**158.3**	**34.7**	**119.6**	**26.3**

Note: *Numbers have been rounded; “-” = not applicable

NWI wetland mapping was conducted in 1977 before more recent high quality aerial imagery and modern Geographic Information System (GIS) mapping techniques and prior to the completion of the Bradley Lake Hydro Project dam and access roads and the Upper Battle Creek diversion and access road. DOWL wetland mapping consisting of on-the-ground fieldwork combined with GIS landscape-scale wetland mapping identified more wetland acres than the NWI.

Hydrogeomorphic classification (HGM) is used to evaluate geomorphic setting, water source and its transport, and hydrodynamics (Brinson 1993). The wetlands and waters in the study area fall into depressional, riverine, and slope HGM classifications (Table 5-5). Depressional wetlands and waters include kettles, potholes, and vernal pools. They typically receive hydrology from precipitation. Riverine wetlands and waters form linear strips in the landscape and receive hydrology from streams. Slope wetlands include surface water slope and groundwater slope that receive hydrology in the form of precipitation, overland flow, or groundwater.

Table 5-5 HGM classifications of wetlands and riverine waters in the study area.

HGM Classification	Acres	Percent of Study Area
Depressional	2.0	0.4
Riverine	148.5	32.5
Slope	0.9	<0.1
Subtotal	151.4*	33.1

Note: *Numbers have been rounded; Bradley Lake and ponds excluded from HGM table.

All wetlands and waters within the study area are connected by a surface connection through several small, high-gradient streams flowing into Bradley Lake and then the Bradley River or into the Martin River, both of which flow to Kachemak Bay, a traditional navigable water.

6.0 DISCUSSION

A wetland delineation was conducted to assess aquatic resources present within the study area. Wetlands were classified by Cowardin and HGM characteristics in a study area composed of buffered components of the proposed Project with fill placement or inundation due to Bradley Lake level rise. This report identifies 4.0 acres of wetlands (PEM and PSS), 7.0 acres of ponds and lakes (PUBH and L2UBH), and 147.4 acres of streams (R3 and R4) (6,247,940 linear feet) in the study area (Table 5-3 Cowardin Classifications).

Due to the receding glaciers at the head of Bradley Lake, soil development is relatively new with dominant gravels and cobbles and thin to no organic layers. The braided stream channels consisted of active channel, recently disturbed areas devoid of vegetation, and vegetated areas with minimal soil development and less frequent hydrologic indicators. These areas within the braided stream system and located below the bankfull elevation of the active channel are mapped as part of the riverine system. Positive hydrologic observations include drift deposits and alders stripped of lower leaves (higher leaves intact).

7.0 STUDY STATUS AND SCHEDULE

The *Wetland Delineation Study* is considered complete. This wetland delineation report and data will be used to assess potential impacts to wetlands in the FERC license amendment application, develop avoidance and minimization measures, identify compensatory mitigation requirements, and obtain a USACE Section 404 permit. A functional assessment of jurisdictional wetlands will be completed at the time of Section 404 permitting.

8.0 REFERENCES

Alaska Department of Fish and Game (ADF&G). 2024. Alaska Fish Resource Monitor, Anadromous Waters Catalog. Data downloaded September 2024: https://adfg.maps.arcgis.com/apps/MapSeries/index.html?appid=a05883caa7ef4f7ba17c99274f2c198f.

Brinson, M.M. 1993. A hydrogeomorphic classification for wetlands. Prepared for the U.S. Army Corps of Engineers. Page 101. Technical report; WRP-DE-4.

Collet, Dominique M. 2002. Willows of Southcentral Alaska. Kenai Watershed Forum.

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

Gallant, Alisa L., Binnian, Emily F., Omernik, James M., Shasby, Mark B. 1995. Ecoregions of Alaska. U.S. Geological Survey Professional Paper 1567. Prepared in cooperation with Colorado State University and the Environmental Protection Agency.

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

Kleinschmidt Associates. 2022a. Initial Consultation Document. Amendment to Bradley Lake Hydroelectric Project (FERC No. 8221), Proposed Dixon Diversion. Prepared for the Alaska Energy Authority. April 27, 2022.

Kleinschmidt Associates. 2022b. Draft Study Plan. Amendment to Bradley Lake Hydroelectric Project (FERC No. 8221), Proposed Dixon Diversion. Prepared for the Alaska Energy Authority. November 2022.

Kleinschmidt Associates. 2024. 2024 Study Reports. Amendment to Bradley Lake Hydroelectric Project (FERC No. 8221), Proposed Dixon Diversion. Prepared for the Alaska Energy Authority. November 2024.

Natural Resources Conservation Service (NRCS). 2024. Web Soil Survey. United States Department of Agriculture. Data downloaded September 2024: https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx.

Pojar, Jim and A. MacKinnon. 2013. Alpine Plants of the Northwest: Wyoming to Alaska. Lone Pine Media Productions (B.C.) Ltd.: B.C. Ministry of Forests, Vancouver, British Columbia.

Pojar, Jim and A. MacKinnon. 2016. Plants of the Pacific Northwest Coast: Washington, Oregon, British Columbia & Alaska. Lone Pine Media Productions (B.C.) Ltd.: B.C. Ministry of Forests, Vancouver, British Columbia.

Pratt, Verna E. 1990. Field Guide to Alaskan Wildflowers: Commonly Seen Along Highways and Byways. Alaskakrafts; 1st edition.

Tande, Gerald and Robert Lipkin. 2003. Wetland Sedges of Alaska. Alaska Natural Heritage Program. Environment and Natural Resources Institute, University of Alaska Anchorage.

United States Army Corps of Engineers (USACE). 1987. Environmental Laboratory. Corps of Engineers Wetland Delineation Manual. Technical Report Y-871. Vicksburg, Mississippi. Corps, Waterways, Experiment Station.

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

USACE. 2023. 2022 National Wetland Plant List version 3.6-Alaska Region. US Army Engineer Research and Development Center, Vicksburg, MS.

United States Fish and Wildlife Service (USFWS). 2024. National Wetland Inventory, Wetlands Mapper. Data downloaded September 2024: https://www.fws.gov/wetlands/data/mapper.html.

United States Geological Survey (USGS). 2024. NHDPlus High Resolution (National Hydrography Dataset). Data downloaded September 2024: https://www.usgs.gov/core-science-systems/ngp/nationalhydrography/nhdplus-high-resolution.

Viereck, L.A., C.G. Dyrness, A.R. Batten, and K.J. Wenzlick. 1992. “The Alaska Vegetation Classification.” U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, Oregon. Gen. Tech. Rep. PNW-GTR-286.

APPENDIX A

CONSULTATION RECORD

ALASKA ENERGY AUTHORITY

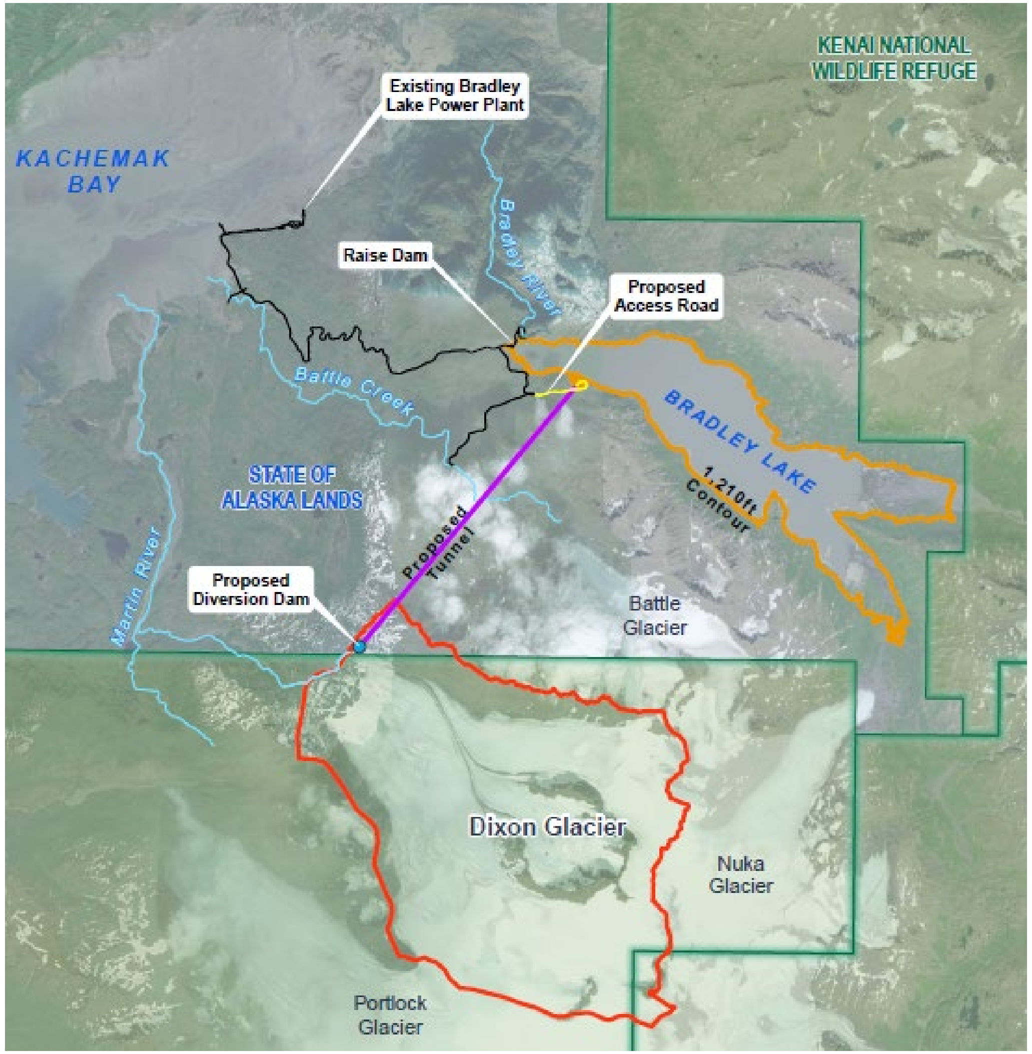
DIXON DIVERSION

Bryan Carey, P.E.
Director of Owned Assets

USACE Pre-application Meeting
May 7, 2024

ALASKA ENERGY AUTHORITY

Project Overview

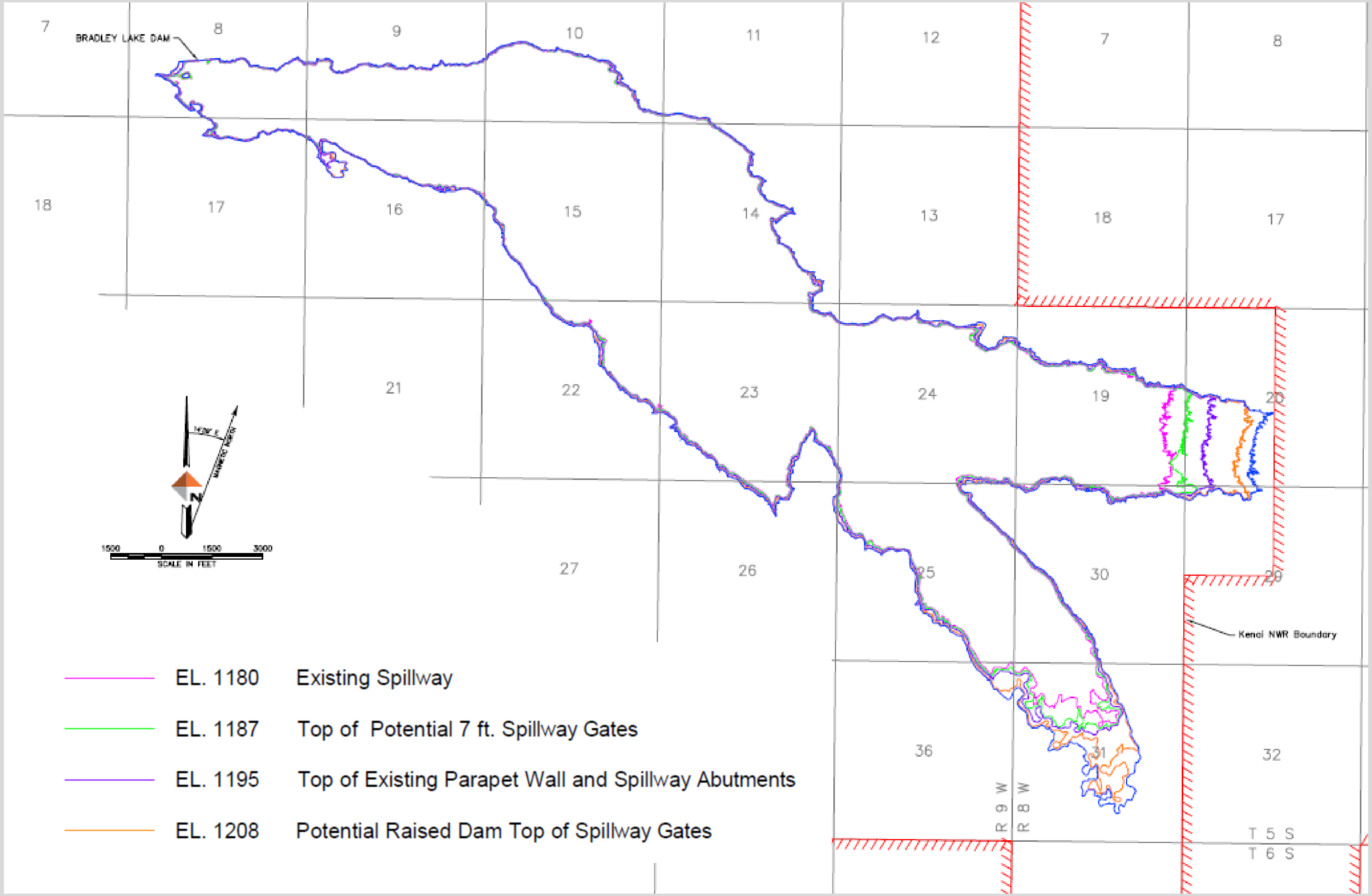


Project Elements:

- Raise Bradley Dam and Lake
- New Dixon Diversion Dam
- Diversion Tunnel to Bradley Lake
- New Access Road from Battle Creek road to tunnel outlet
- Underground Power Line

Bradley Lake Dam and Pool Raise

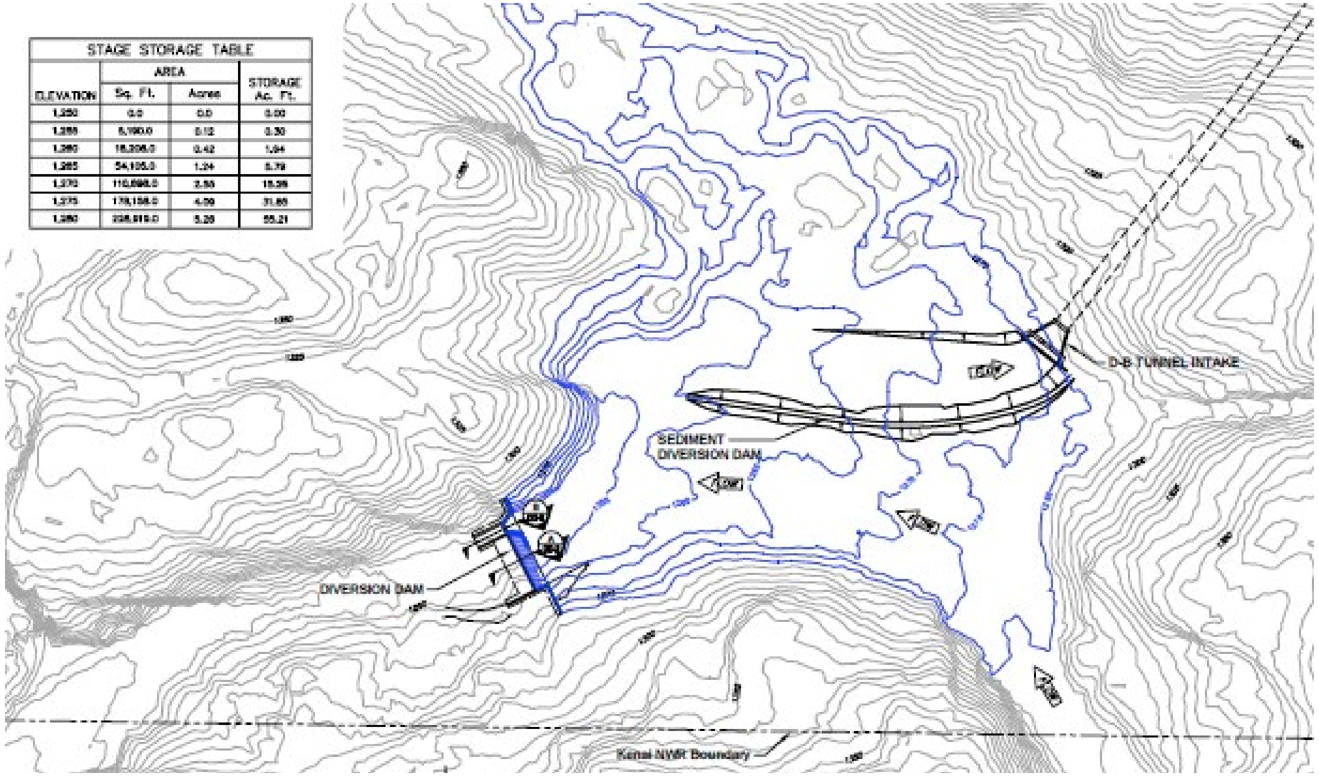
- Up to 28-ft WSE increase
  - 1,208 ft elev
  - 404 acres
  - State land



Dixon Glacier Source

Dixon Diversion Dam and Intake Location

- 25 ft high, ~75 ft long diversion dam near toe of Dixon Glacier

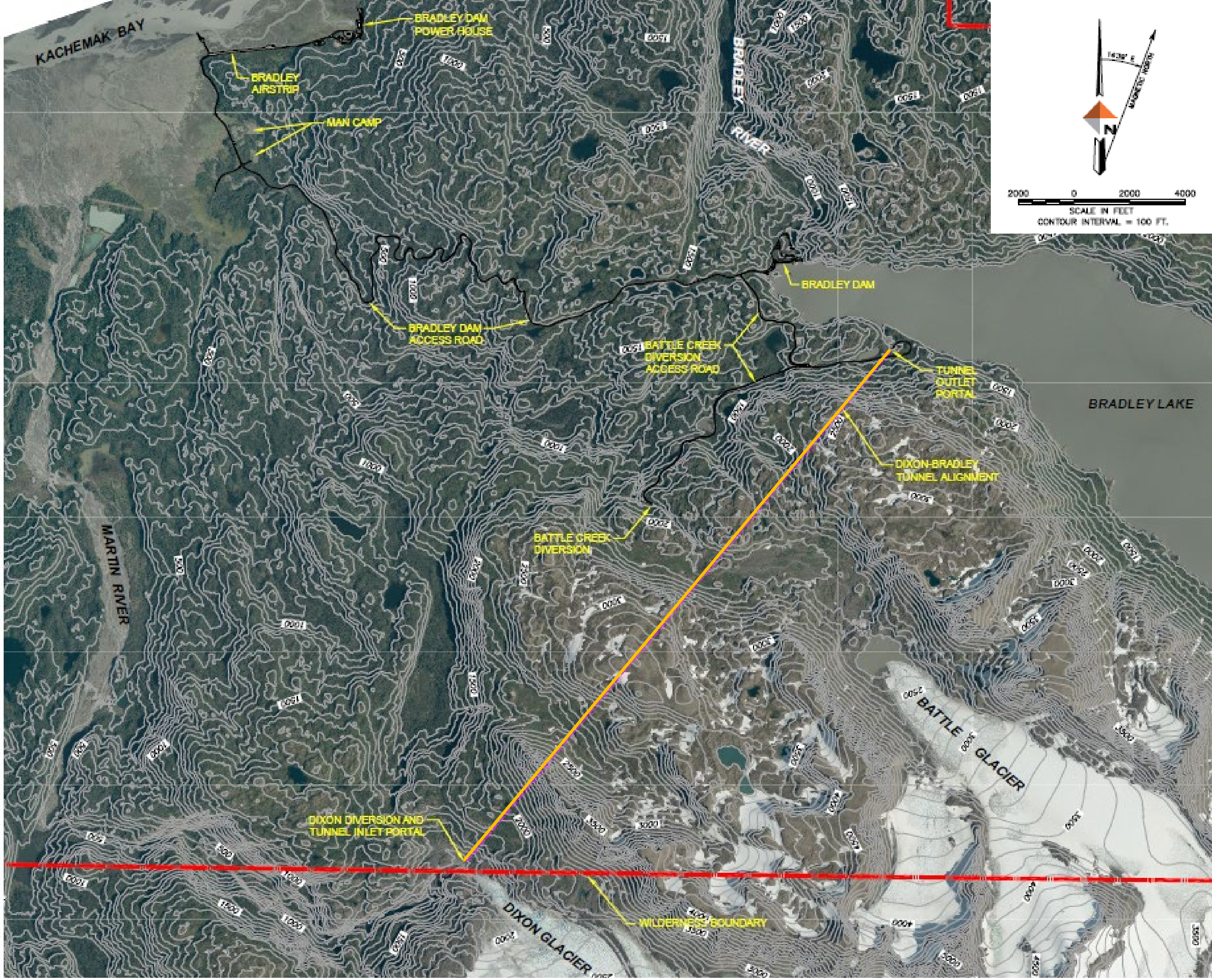


STAGE STORAGE TABLE			
	AREA		STORAGE
ELEVATION	Sq. Ft.	Acres	Ac. Ft.
1,250	0.0	0.0	0.00
1,255	5,190.0	0.12	0.30
1,260	18,206.0	0.42	1.64
1,265	54,105.0	1.24	5.79
1,270	110,898.0	2.55	15.39
1,275	178,158.0	4.09	31.85
1,280	228,818.0	5.26	55.21

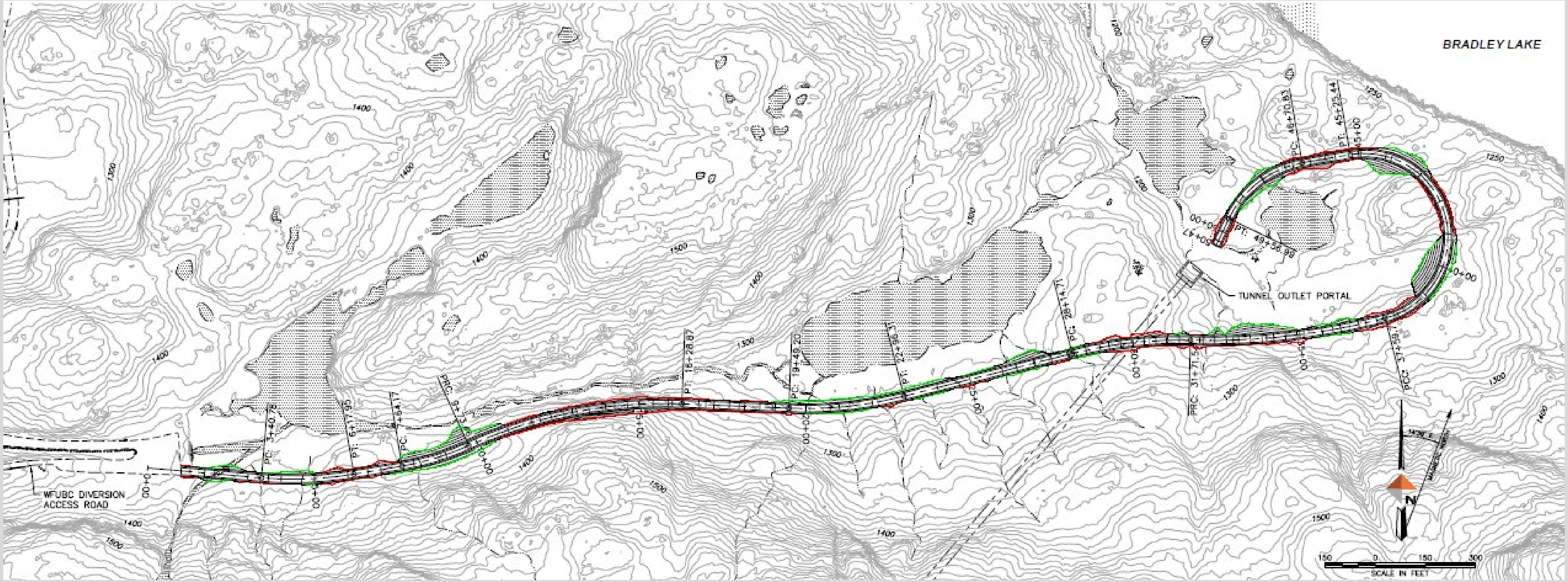
This is an example rendition of potential design alternative

Diversion Tunnel

- Diversion Dam to Bradley Lake
- 4.7 miles long



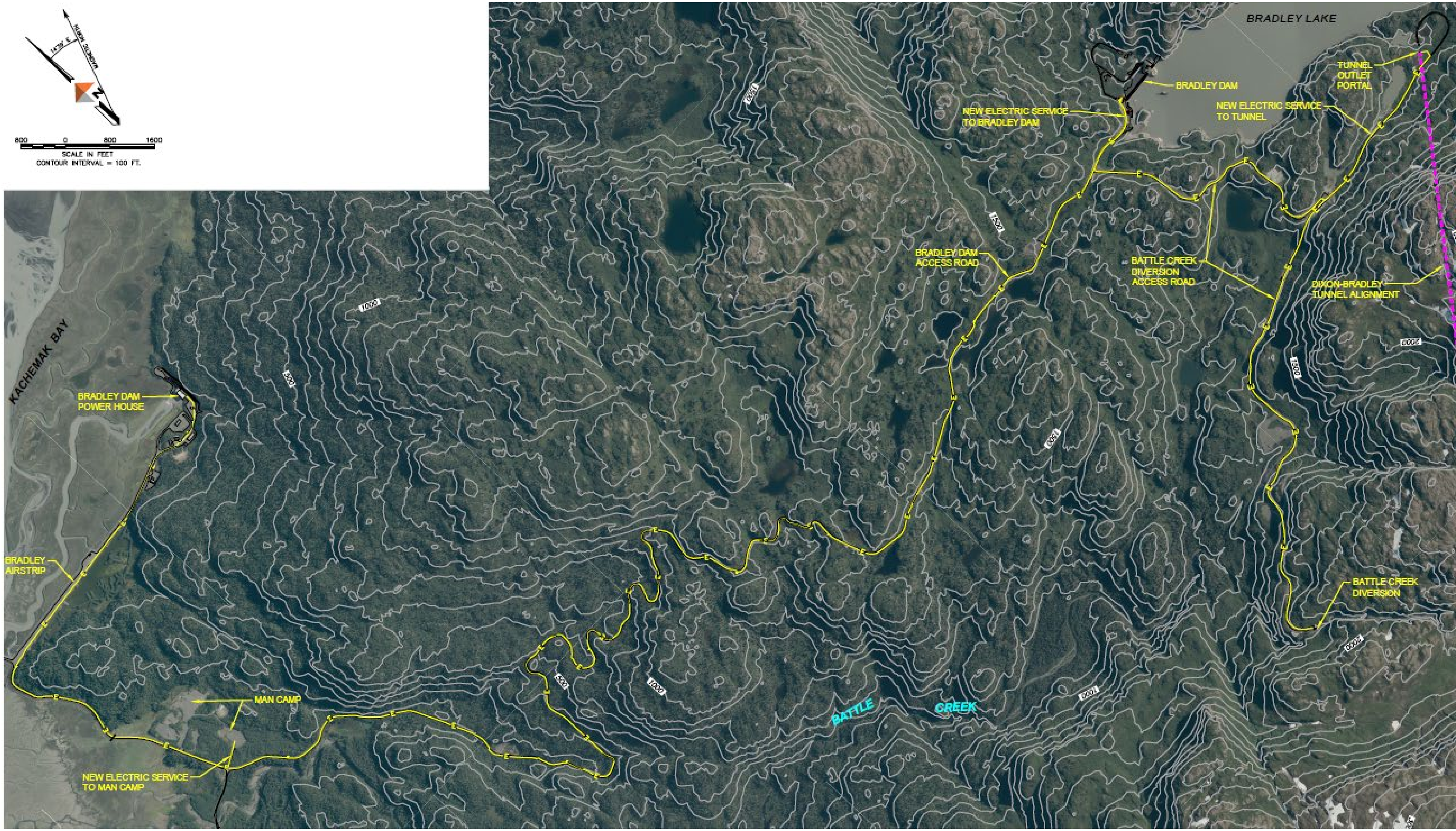
New Access Road



New 16-ft wide gravel-surfaced access road from WFUBC Diversion Road to the Dixon Tunnel outlet portal

Underground Power Line

- Along existing road from powerhouse to Bradley Dam, and Battle Creek Diversion
- Along new road to Dixon tunnel outlet portal
- Within tunnel to Dixon Diversion
- Spur to worker camp



QUESTIONS?

From:	Josh Grabel
To:	Baggett, Nicholas S CIV USARMY CEPOA (USA)
Cc:	Betsy McGregor
Subject:	Dixon Diversion Project Pre-App Info
Date:	Friday, May 3, 2024 2:46:58 PM

Nick,

Here is some reference information before our Pre-app meeting next week:

https://www.akenergyauthority.org/What-We-Do/Railbelt-Energy/Bradley-Lake-Hydroelectric-Project/Dixon-Diversion-Project

https://www.akenergyauthority.org/Portals/0/Bradley%20Lake%20Hydroelectric%20Project/2022.04.01%20Dixon%20Diversion%20ICD.pdf?ver=2022-05-17-162731-313

The current project includes:

- Raise Bradley Dam and Lake
- New Dixon Diversion Dam
- Diversion Tunnel to Bradley Lake
- New Access Road from Battle Creek Road to tunnel outlet
- Underground Power Line

ABR put together a nice presentation with an AEA overview here:

https://www.akenergyauthority.org/Portals/0/Bradley%20Lake%20Hydroelectric%20Project/2024.03.19%20AEA%20Dixon%20Division%20JAM%20Terrestrial%20FSP%20(Final).pdf?ver=reCrYLn0ebBgjJuox66Ang%3d%3d

Slide Pages 8-11 are the current project being proposed.

Here is a proposed agenda for our discussion:

1. Introductions
2. Project Overview
3. 2024 Wetland Delineation Plan
4. Section 404 Permitting

Thanks,

Josh Grabel, PWS
Environmental Specialist

DOWL

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MEETING NOTES

PROJECT:	Dixon Diversion Project	DATE:	May 7, 2024
PROJECT NUMBER:	DOWL 63471	TIME:	2:00 pm
ORGANIZER:	Josh Grabel	SUBJECT:	2024 Wetland Delineation

PARTICIPANTS:	ORGANIZATION:
Nicholas Baggett	US Army Corps of Engineers (USACE), Project Manager
Josh Grabel	DOWL
Betsy McGregor	Kleinschmidt
Bryan Carey	Alaska Energy Authority
Ryan McLaughlin	Alaska Energy Authority

Agenda

1. Introductions
2. Project Overview- Bryan
3. 2024 Wetland Delineation Plan- Josh
4. Section 404 Permitting
5. Questions

Notes

Bryan gave a complete project overview and Josh went through the 2024 wetland delineation plan to evaluate the 5 areas presented in the project overview:

- Raise Bradley Dam and Lake
- New Dixon Diversion Dam
- Diversion Tunnel to Bradley Lake
- New Access Road from Battle Creek Road to tunnel outlet
- Underground Power Line

Nick- indicated new impounded areas of Bradley Lake will need wetlands delineation data and to be included in the report. At tunnel inlet, need to collect wetland delineation data for impounded area behind diversion dam.

Betsy- AEA, has OHW been documented at the tunnel inlet?

Bryan- OHW has not been set with flagging or markers on the ground. Lidar data has been collected.

Josh- the wetland delineation would collect photo points at the tunnel inlet since the proposed fill and inundation area is rocky, with limited vegetation, and digging may not be possible for a sample point soil pit.

Nick- for the 1-mile access road, USACE needs to know the location of all the stream/drainage crossings by type (intermittent, ephemeral, perennial) and width. No functional assessment is needed for the wetland delineation study area and should be completed for impacts associated with the permit application.

Betsy- AEA, would hydrology be maintained under the road?

Bryan- yes, culverts would be put in place to maintain hydrology. Otherwise, the road could get washed out with water backing up behind it. There is approximately 9 feet of precipitation per year in the area. Having the road washout would be expensive for a remote location. It is cheaper to install culverts. What used to be the headwaters of East Fork Battle Creek, at the west end of the proposed road, flows year-round. AEA is thinking a large culvert or bridge would be placed across it. Bradley Lake does not have any fish and there are no resident or anadromous fish in the project area. The ponds north of the proposed road and at the tunnel outlet flow into Bradley Lake.

Betsy- USACE, would the inundation be considered impacts to waters of the U.S.?

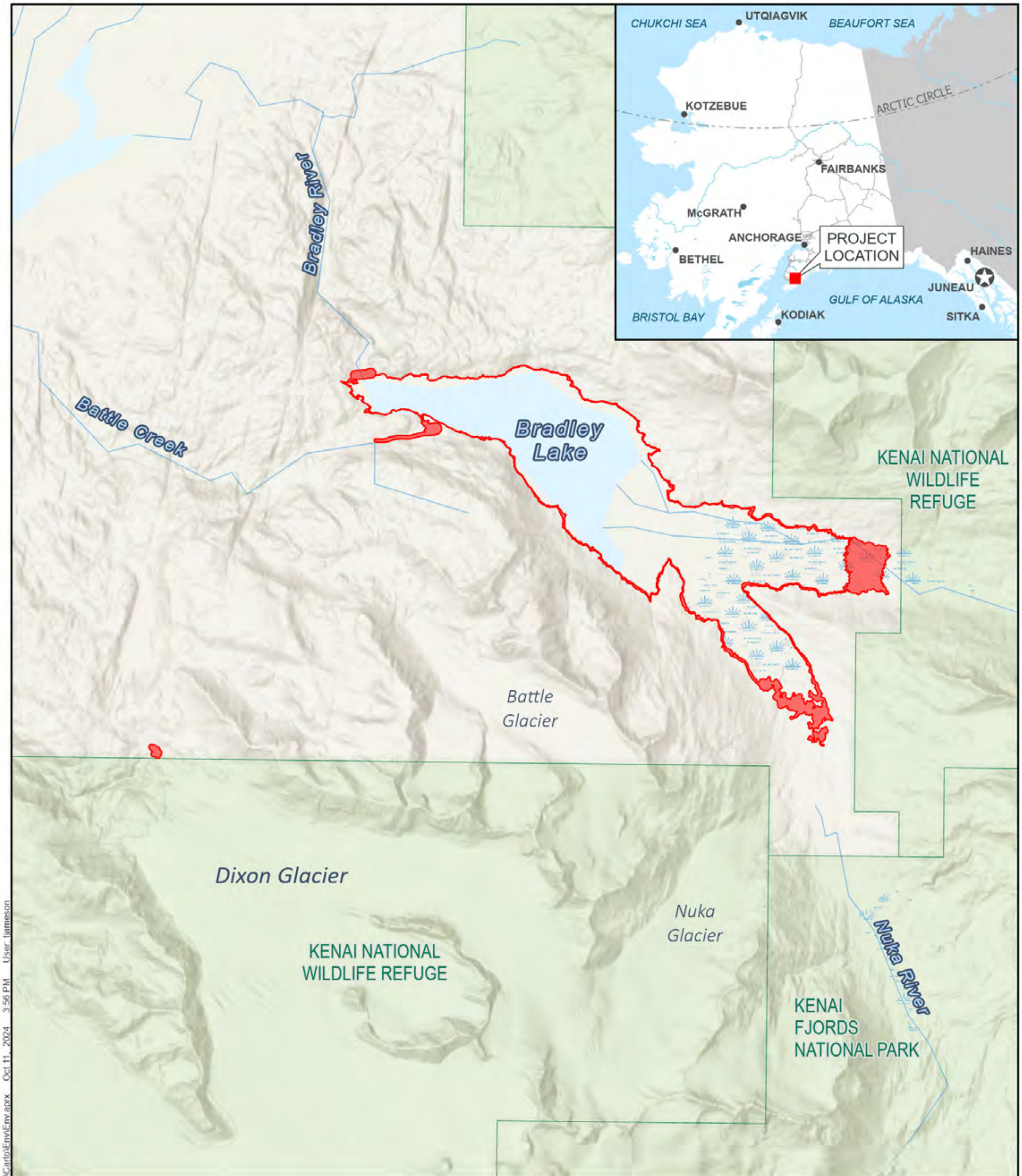
Nick- USACE has to consider all impacts including the impounded area even though it isn't considered fill. Nick will look into permitting through USACE based on impacts. Mitigation discussions should be early on in permitting. Currently, USACE is missing several staff and a 2024 Fall wetlands report deliverable is ideal for review.

Bryan- historically, there was a lake. The site was identified as a potential hydropower resource in the 1950s. The USACE had first considered constructing a hydro project at the site, but the State took over when the project stalled. The State licensed and constructed the existing Bradley Lake Dam. The lake level rise and dam were mitigated for during the original permit. The West Fork Upper Battle Creek diversion did not increase the maximum normal pool elevation of the lake..

Action Item	Assigned To	Completed
Forward 2017 permit to USACE for Battle Creek Diversion	Josh	5/7/2024
Review impounded area decision to include in wetland delineation	Nick	5/7/2024

APPENDIX B

FIGURES



Study Area

N

0 0.75 1.5 Miles

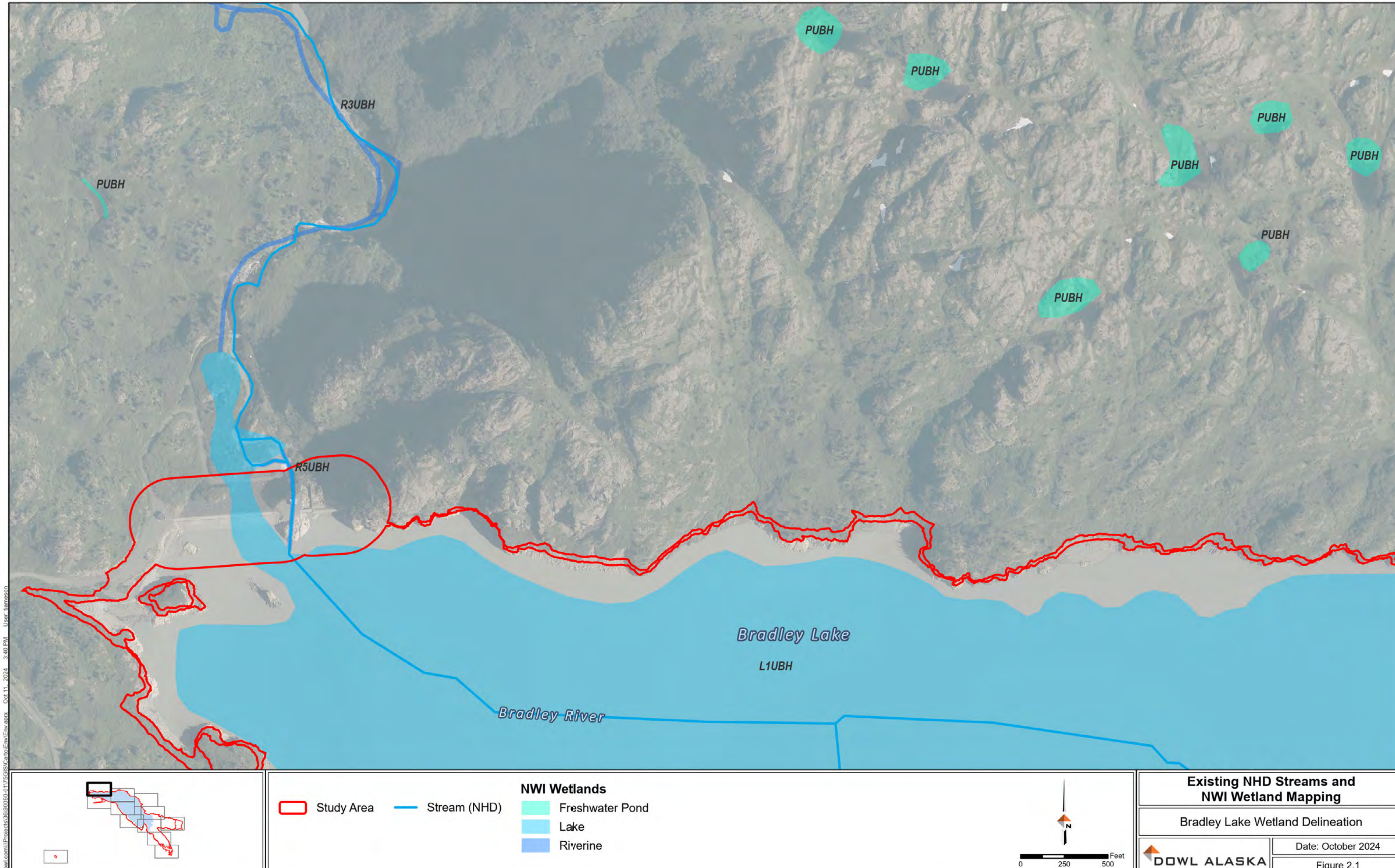
Project Location

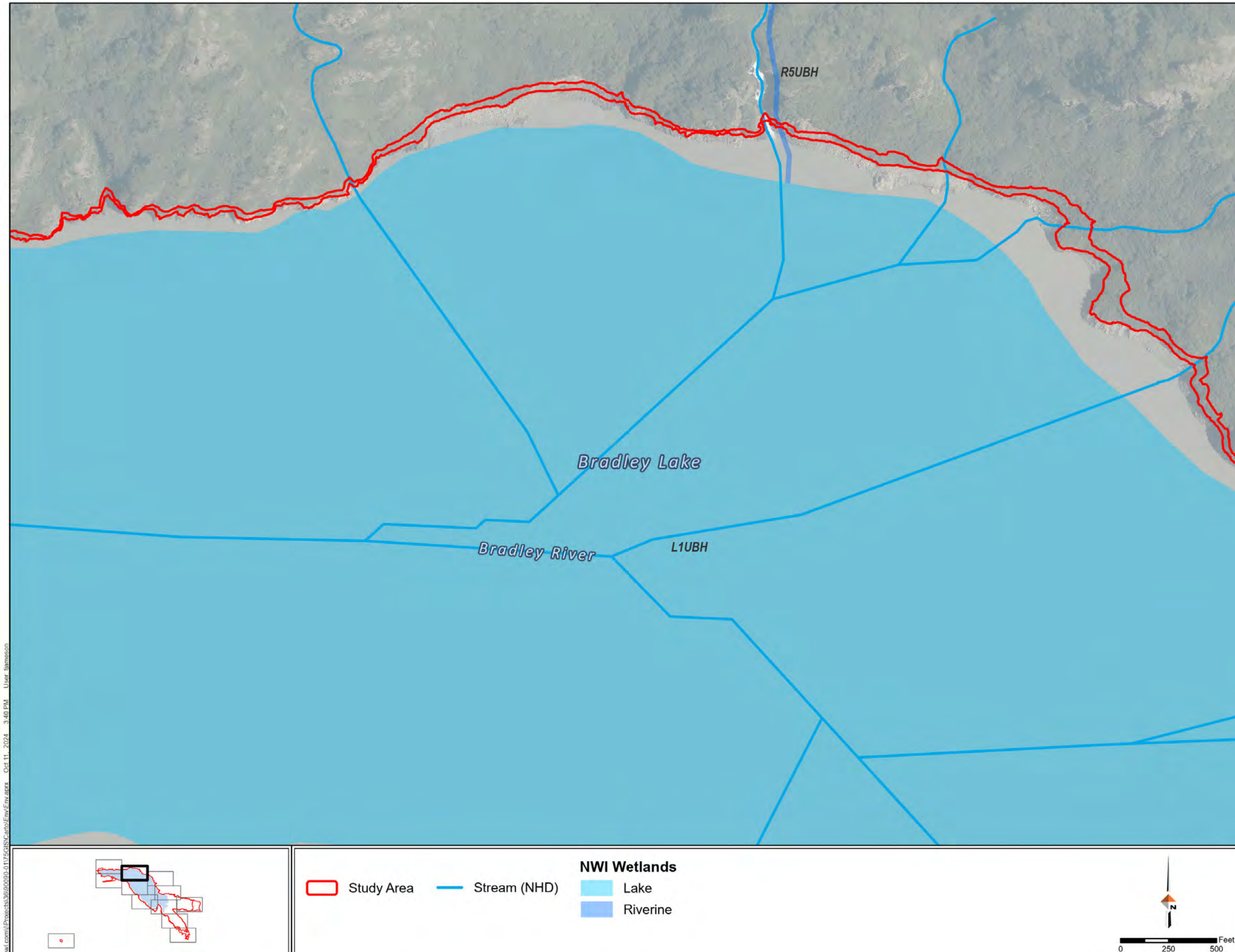
Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 1


PUBH
PUBH
R3UBH
PUBH
PUBH
PUBH
PUBH
PUBH
PUBH
PUBH
R5UBH
Bradley Lake
L1UBH
Bradley River
Study Area
Stream (NHD)
NWI Wetlands
Freshwater Pond
Lake
Riverine
N
Feet
0
250
500
Existing NHD Streams and
NWI Wetland Mapping
Bradley Lake Wetland Delineation
DOWL ALASKA
Date: October 2024
Figure 2.1



Existing NHD Streams and NWI Wetland Mapping

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 2.2

Study Area

Stream (NHD)

NWI Wetlands

Freshwater Forested/Shrub Wetland

Lake

Riverine

Feet 0 250 500

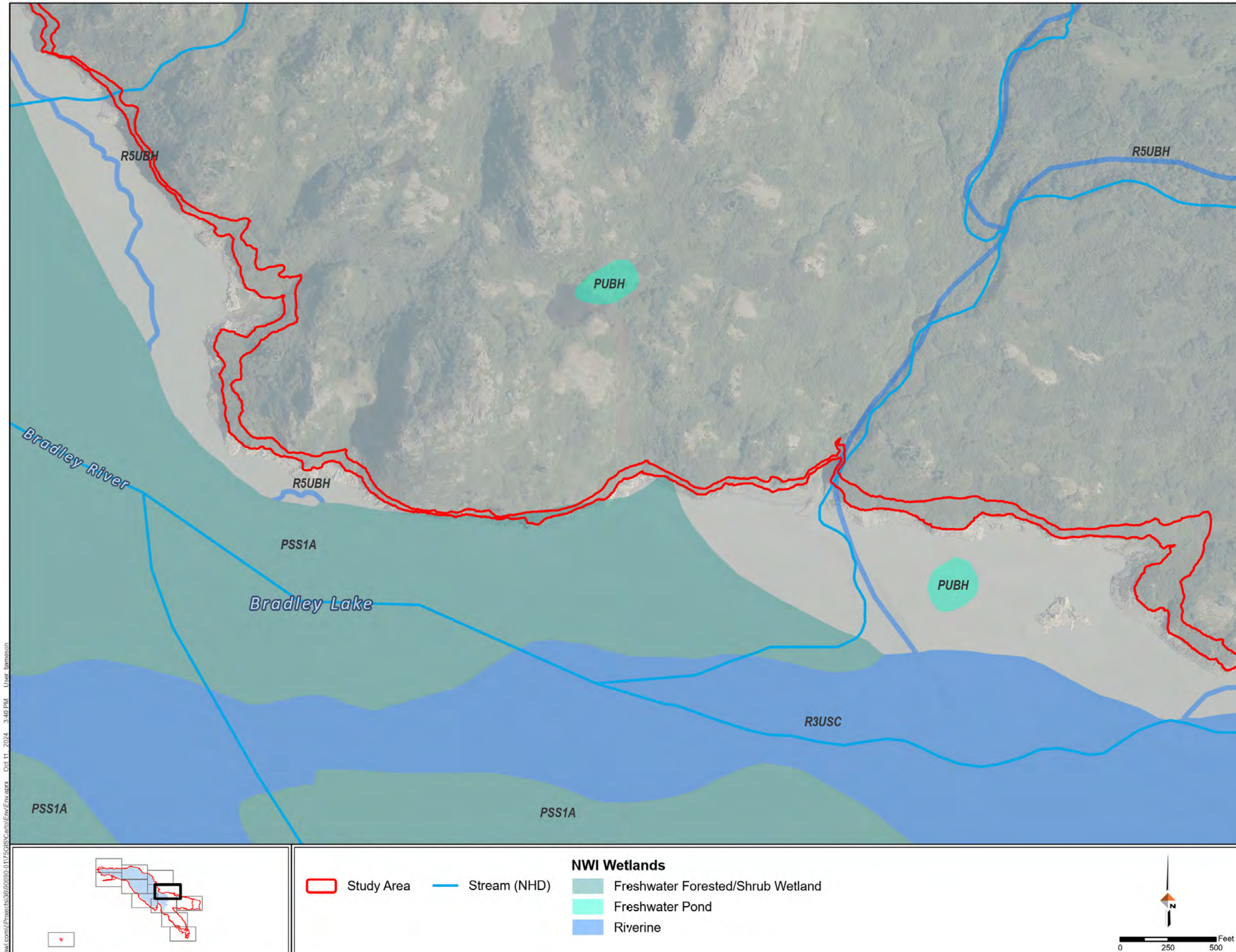
Existing NHD Streams and NWI Wetland Mapping

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 2.3



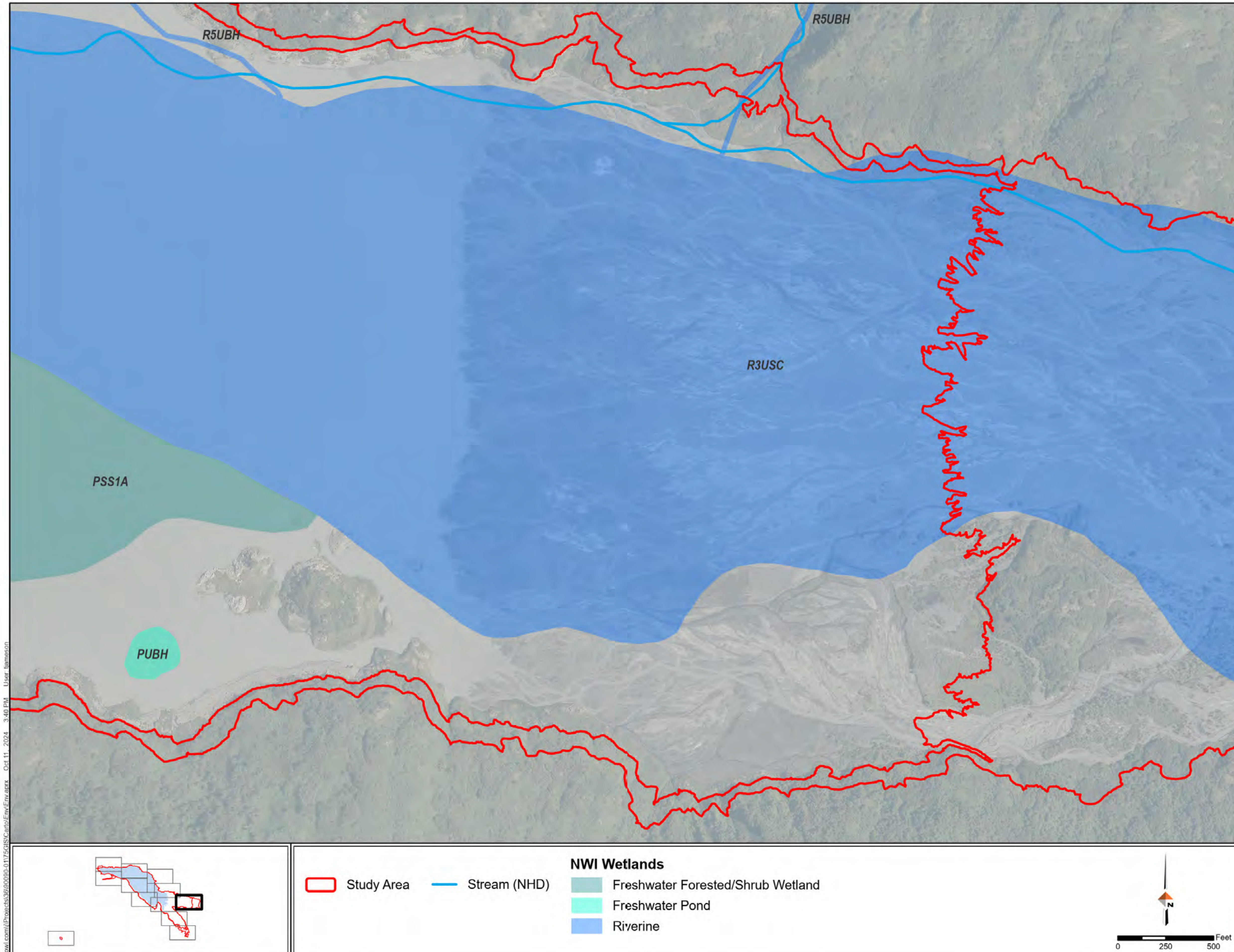
Existing NHD Streams and NWI Wetland Mapping

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 2.4



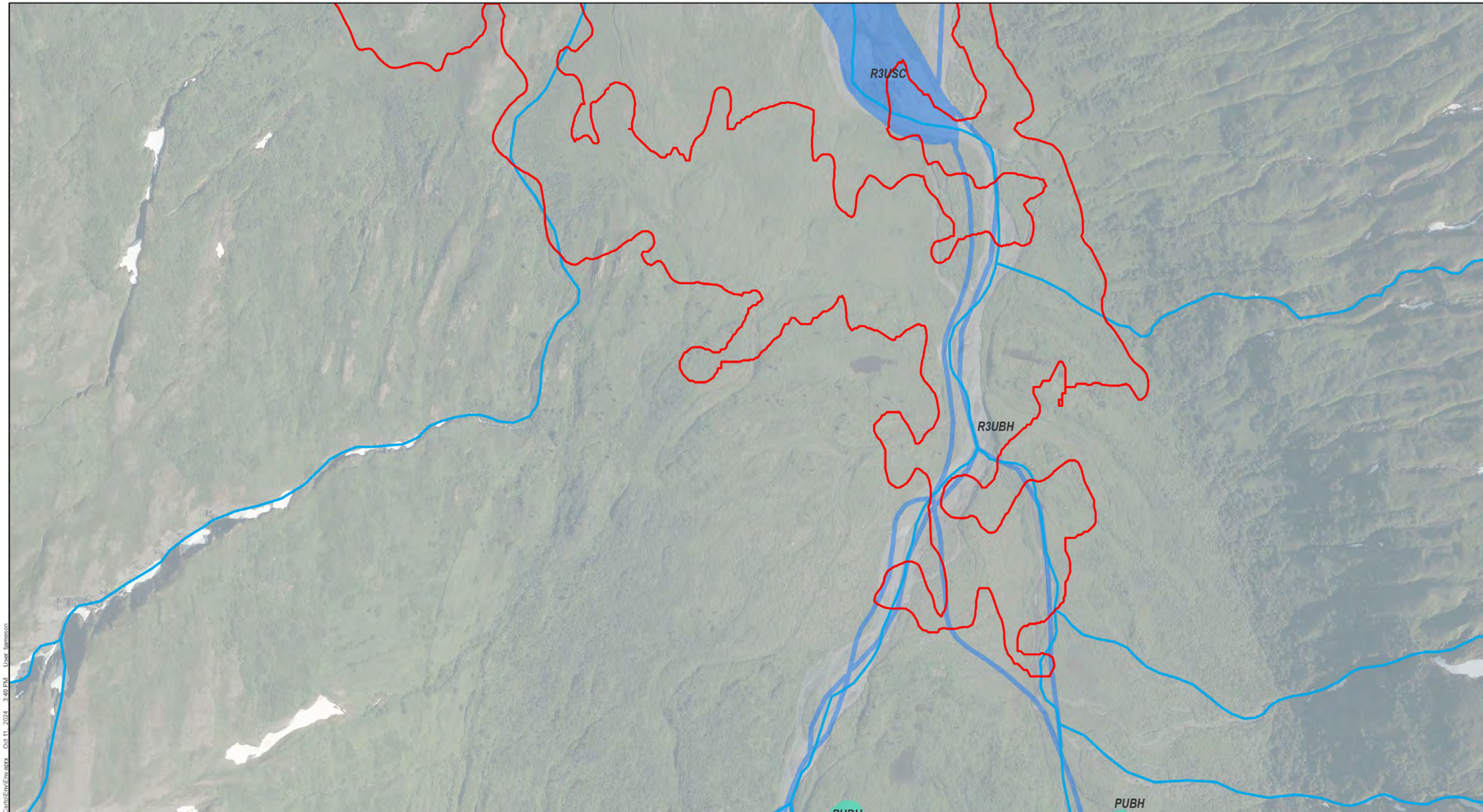
Existing NHD Streams and NWI Wetland Mapping

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 2.5



NWI Wetlands

Study Area
Stream (NHD)
Freshwater Pond
Riverine

Feet
0 250 500

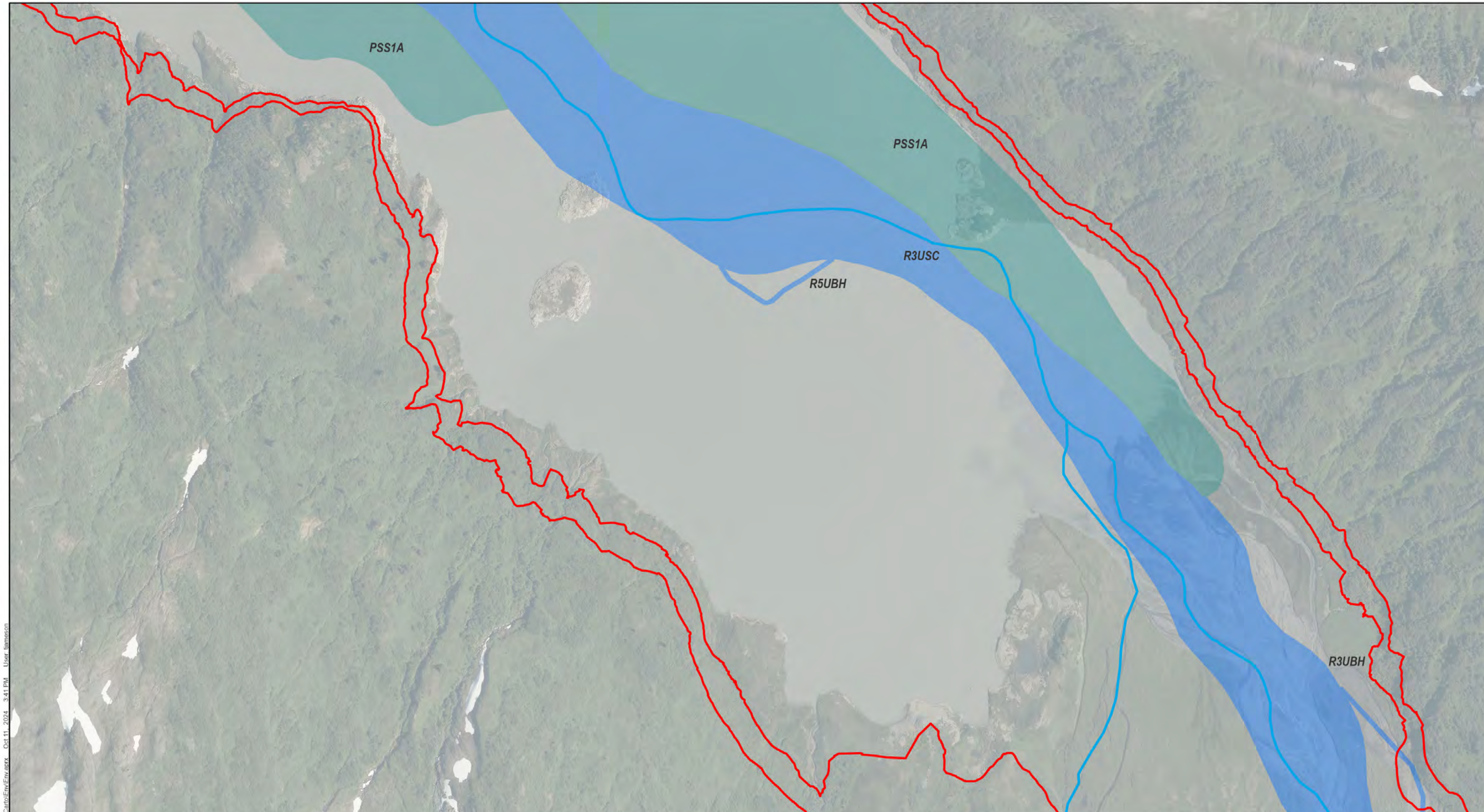
Existing NHD Streams and NWI Wetland Mapping

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 2.6



NWI Wetlands

Study Area
Stream (NHD)
Freshwater Forested/Shrub Wetland
Riverine

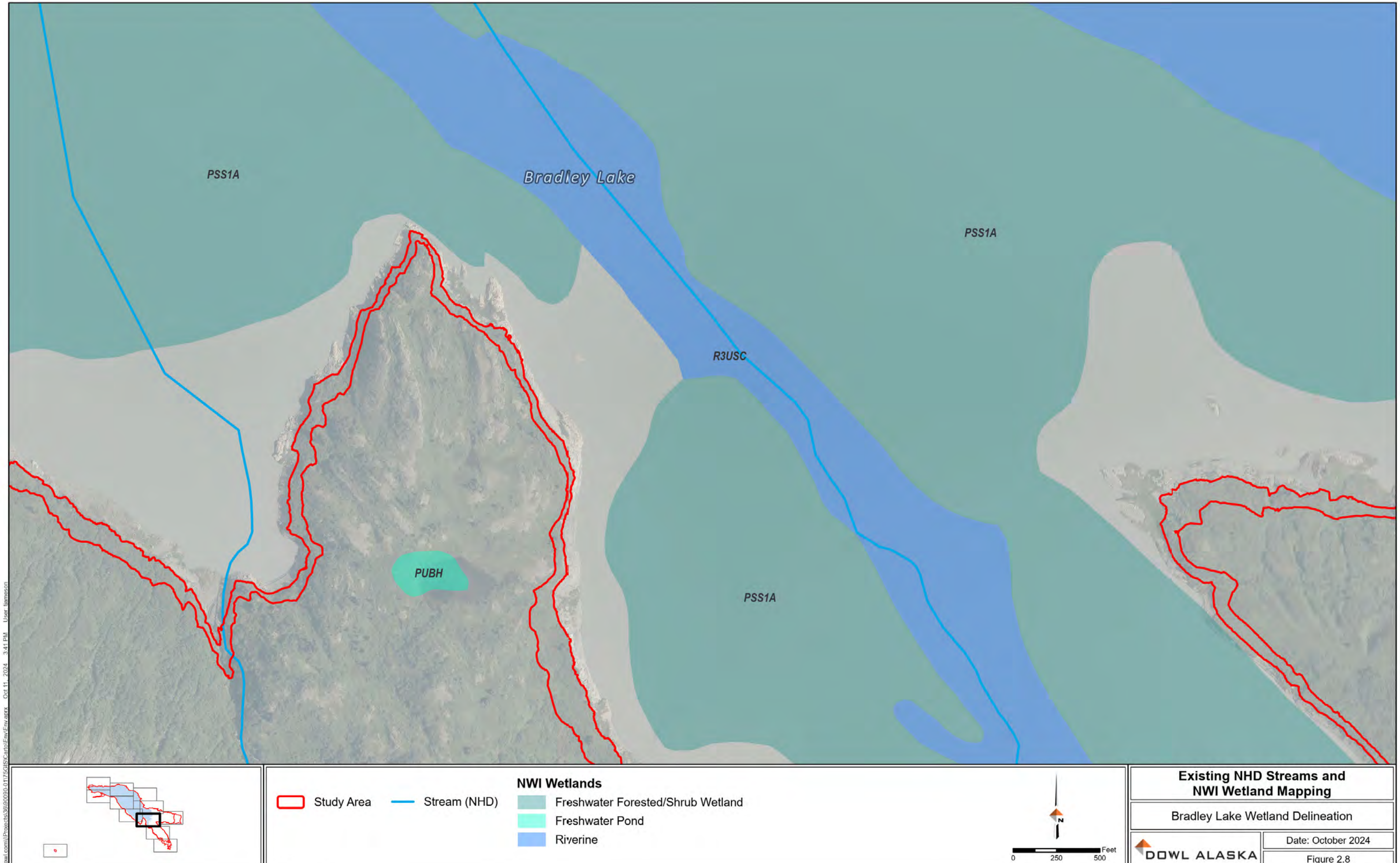
Existing NHD Streams and NWI Wetland Mapping

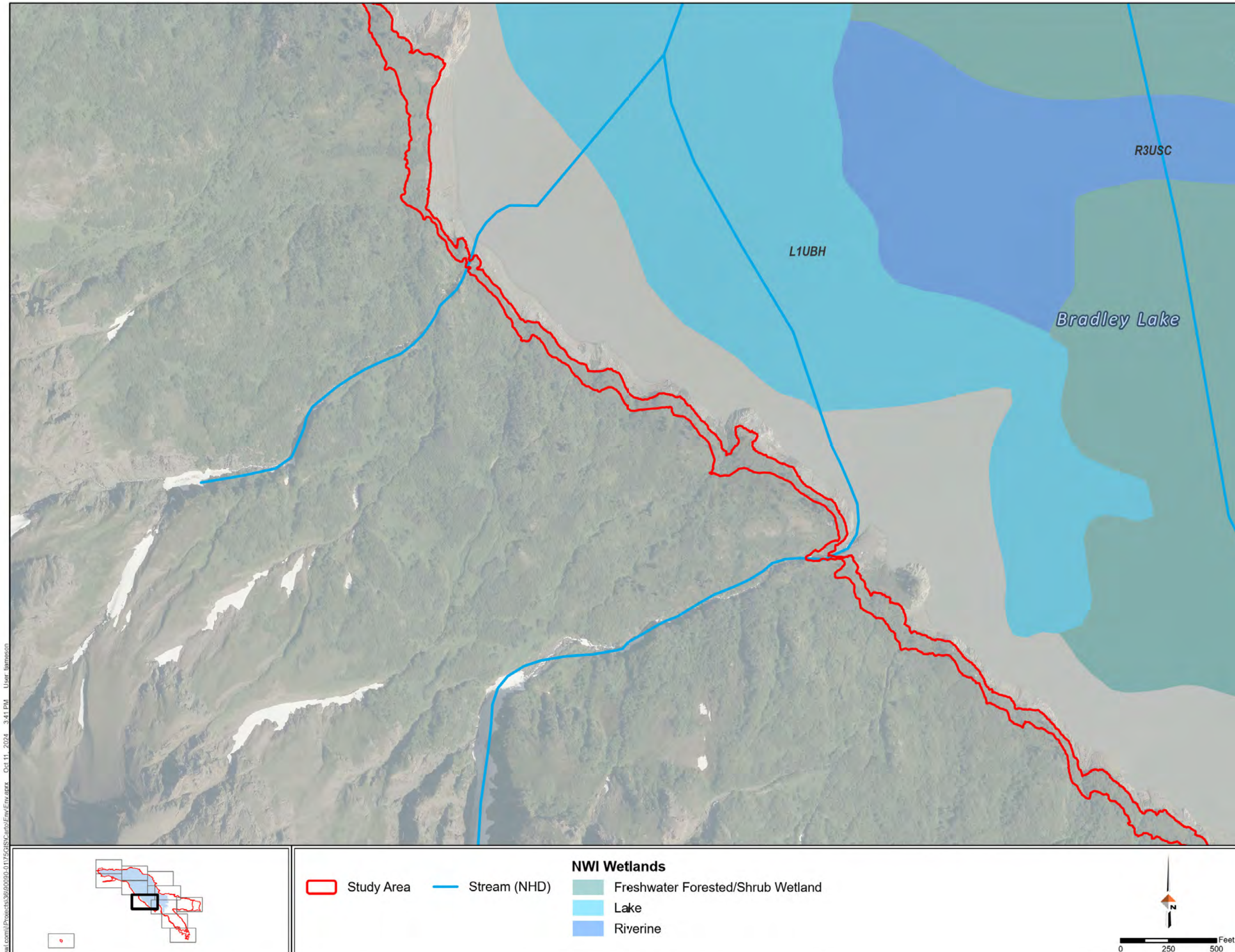
Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 2.7


PSS1A
Bradley Lake
PSS1A
R3USC
PUBH
PSS1A
Study Area
Stream (NHD)
NWI Wetlands
Freshwater Forested/Shrub Wetland
Freshwater Pond
Riverine
N
0
250
500
Feet
Existing NHD Streams and
NWI Wetland Mapping
Bradley Lake Wetland Delineation
DOWL ALASKA
Date: October 2024
Figure 2.8



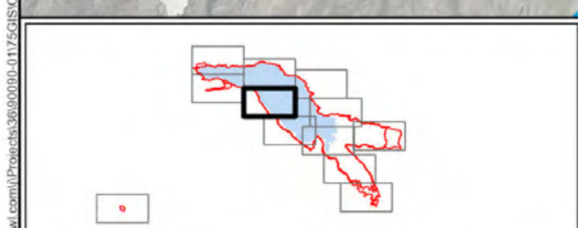
Existing NHD Streams and NWI Wetland Mapping

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 2.9



Study Area

Stream (NHD)

NWI Wetlands

Freshwater Forested/Shrub Wetland

Freshwater Pond

Lake

Feet
0 250 500

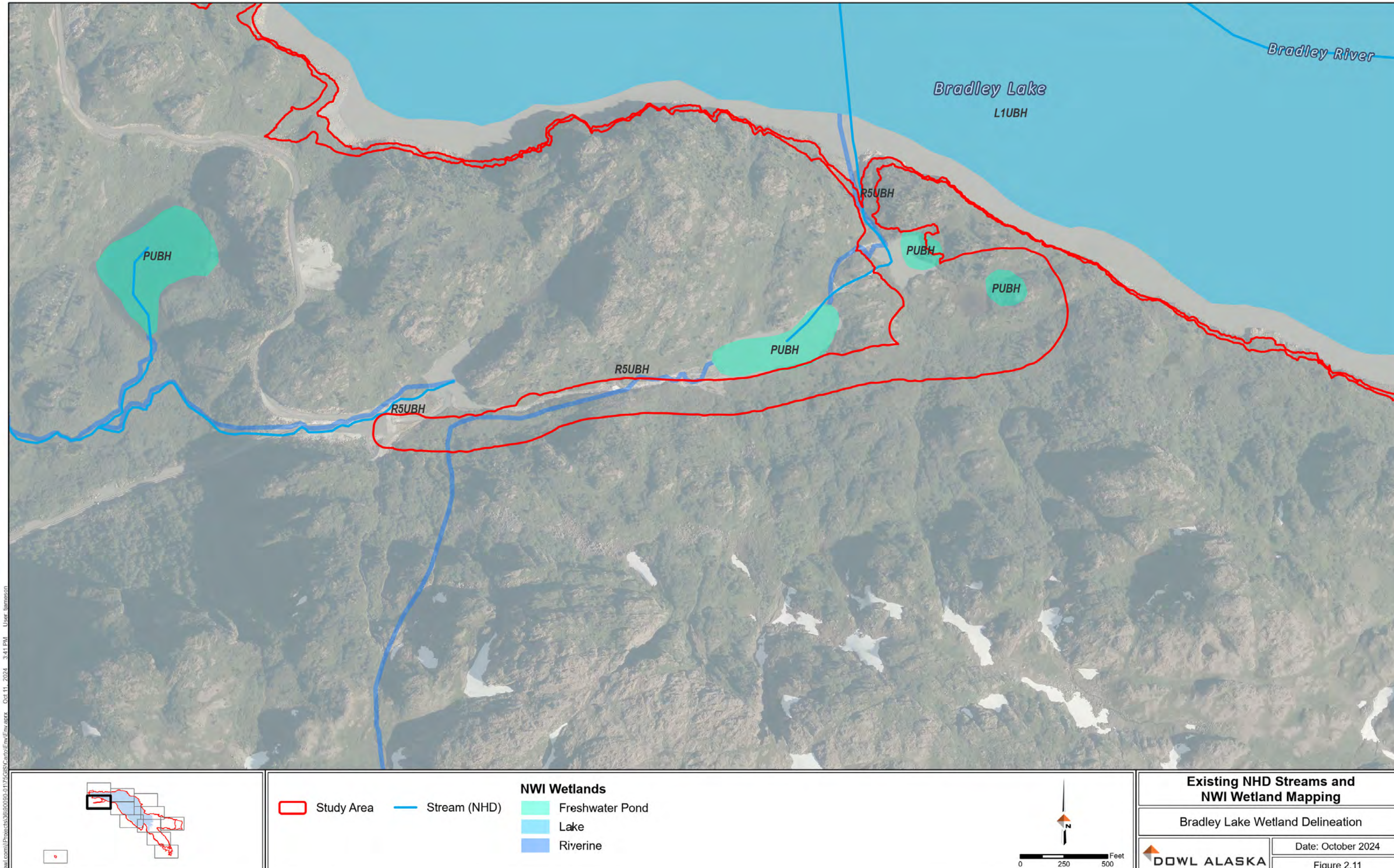
Existing NHD Streams and NWI Wetland Mapping

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 2.10



Existing NHD Streams and NWI Wetland Mapping

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 2.11

Study Area
Stream (NHD)

NWI Wetlands

Freshwater Pond
Riverine

0 250 500 Feet

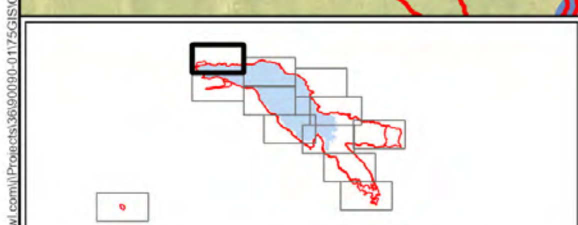
Existing NHD Streams and NWI Wetland Mapping

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 2.12



Study Area

NRCS Soil Unit

- Lithic Haplocryands-Alic Haplocryands-Rock outcrop complex, 25 to 45 percen
- Lithic Haplocryands-Alic Haplocryands-Rock outcrop complex, 45 to 100 perce
- Tutka-Kasitsna-Rock outcrop complex, very steep
- Urban land
- Water

N

0 250 500 Feet

NRCS Mapped Soils

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 3.1

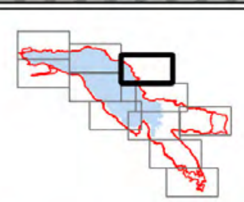
NRCS Mapped Soils

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 3.2



NRCS Soil Unit

- Study Area
- NRCS Soils Data Not Available
- Lithic Haplocryands-Alic Haplocryands-Rock outcrop complex, 45 to 100 perce
- Tutka-Kasitsna-Rock outcrop complex, very steep
- Water

N

0 250 500 Feet

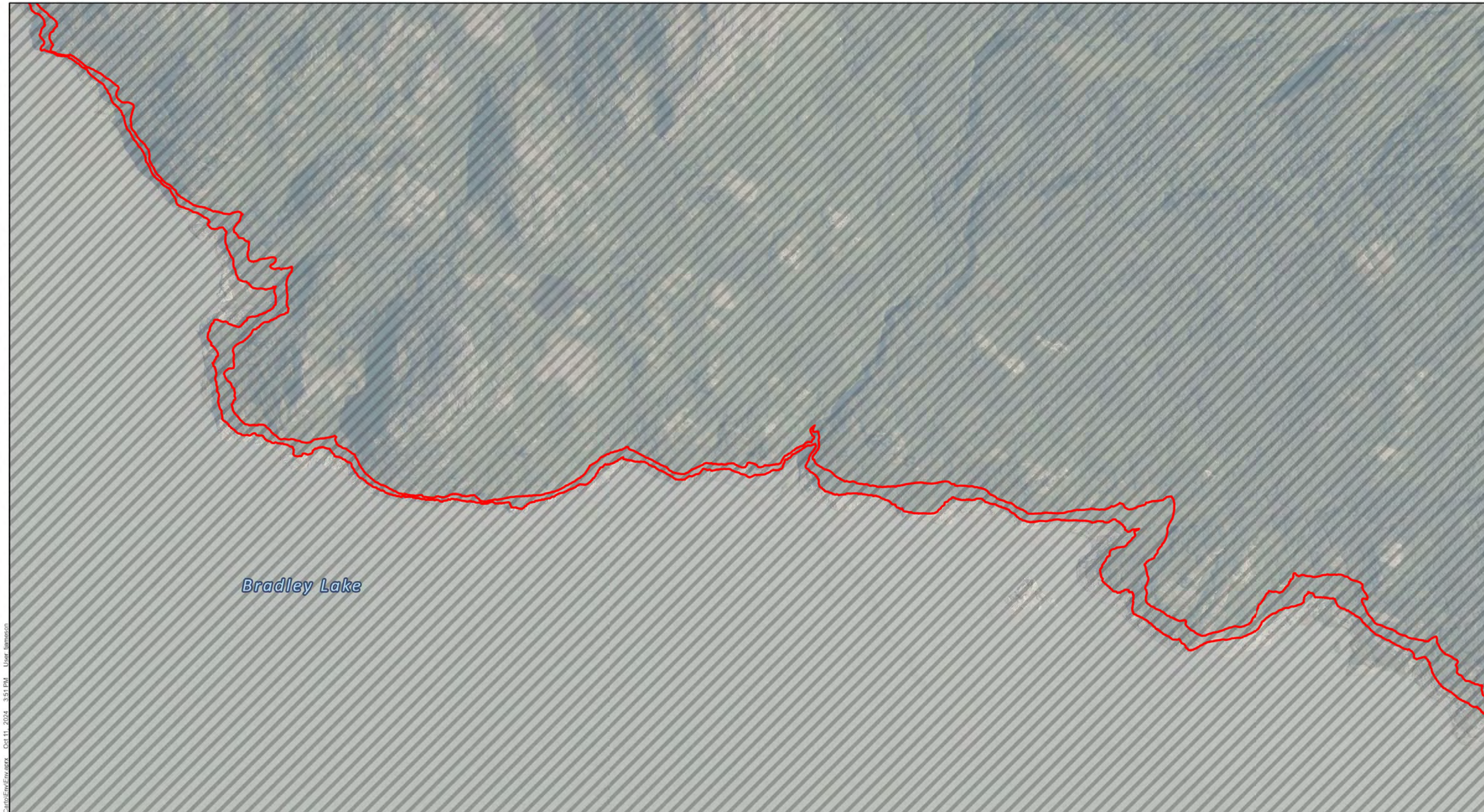
NRCS Mapped Soils

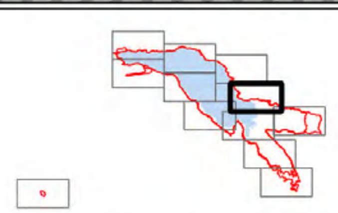
Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 3.3





Study Area

NRCS Soils Data Not Available

Feet
0 250 500

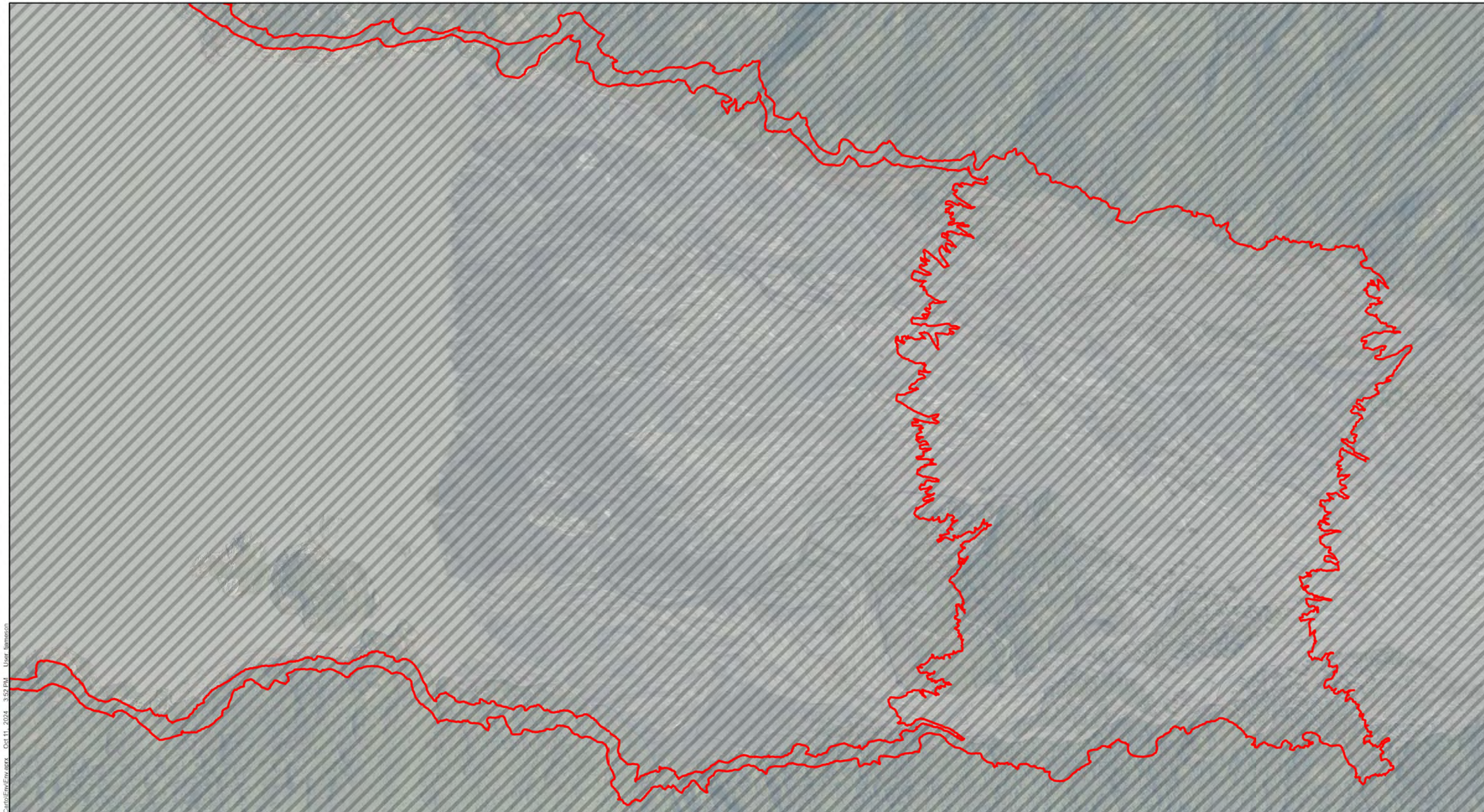
NRCS Mapped Soils

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 3.4



Study Area
NRCS Soils Data Not Available

N

Feet
0 250 500

NRCS Mapped Soils

Bradley Lake Wetland Delineation

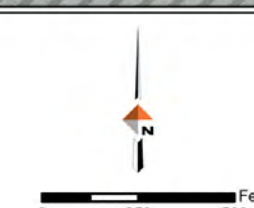
DOWL ALASKA

Date: October 2024

Figure 3.5

Study Area

NRCS Soils Data Not Available



NRCS Mapped Soils

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 3.6

Study Area

NRCS Soils Data Not Available

NRCS Mapped Soils

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 3.7

\\dowl.com\\\Projects\36\90090-01\75GIS\Carto\Env\Env.aprx Oct 11, 2024 3:52 PM User: tjameson

Imagery Credits

Study Area

NRCS Soils Data Not Available

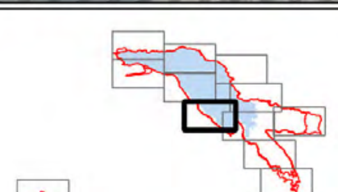
NRCS Mapped Soils

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 3.8



Study Area

NRCS Soils Data Not Available

N

Feet
0 250 500

NRCS Mapped Soils

Bradley Lake Wetland Delineation

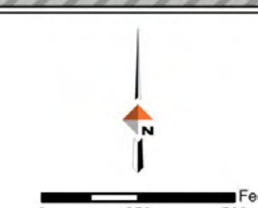
DOWL ALASKA

Date: October 2024

Figure 3.9

Study Area

NRCS Soils Data Not Available



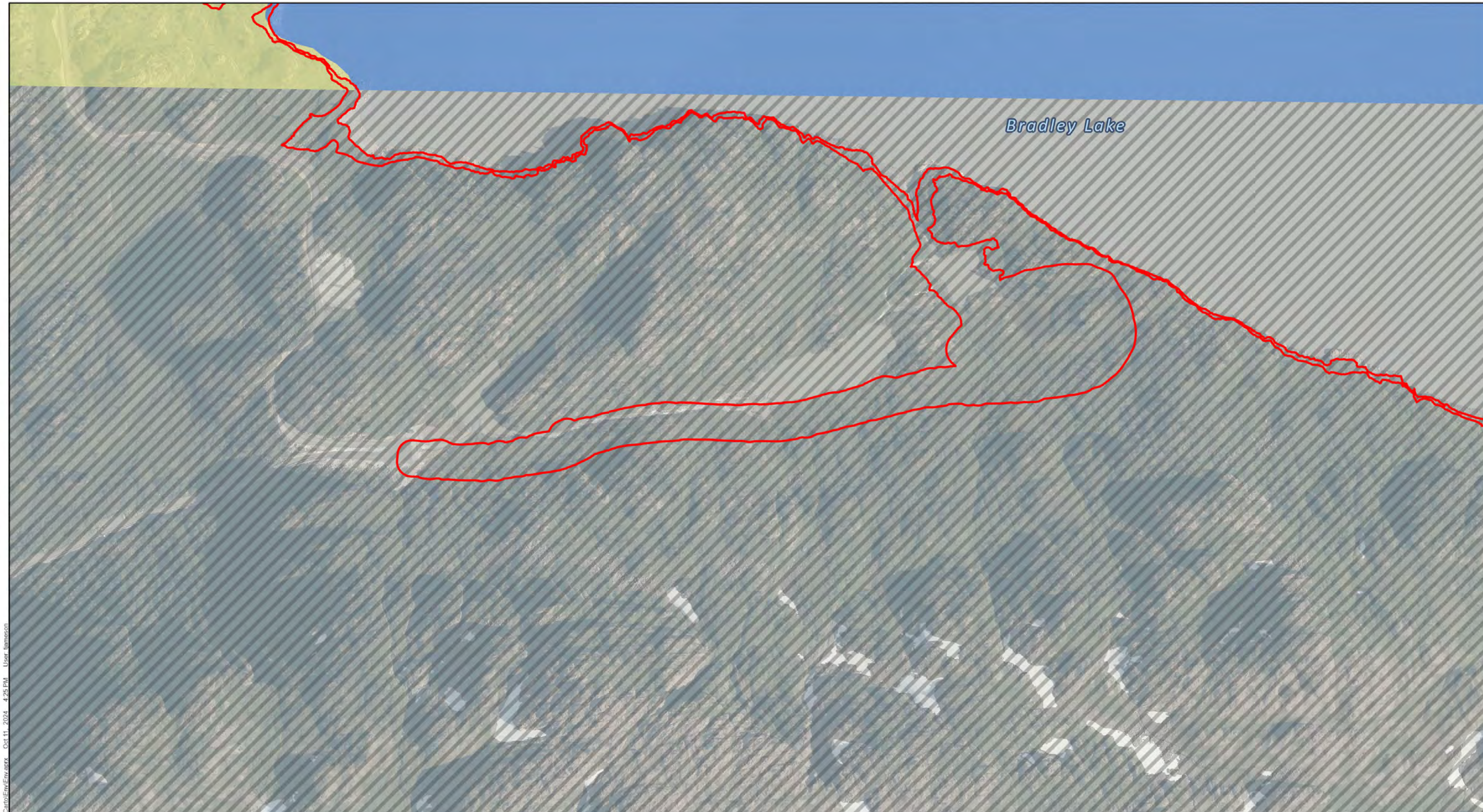
NRCS Mapped Soils

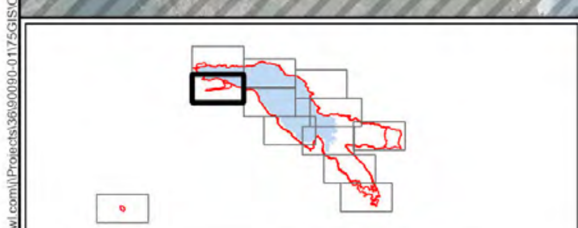
Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 3.10





NRCS Soil Unit

Study Area
NRCS Soils Data Not Available
Lithic Haplocryands-Alic Haplocryands-Rock outcrop complex, 25 to 45 percen
Water

Feet
0 250 500

NRCS Mapped Soils

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 3.11

NRCS Mapped Soils

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 3.12

Field Point
- Study Area
- Photo Point (Stream)
- Photo Point (Upland)

DOWL Mapped Stream (Cowardin)
- R3UBH

DOWL Mapped Wetland (Cowardin)
- L1UBH
- L2UBH
- R3UBH
- Upland

DOWL Mapped HGM
- Riverine
- Slope

Wetland Mapping DOWL Mapped HGM
- Depressional
- Riverine

N

0 125 250 Feet

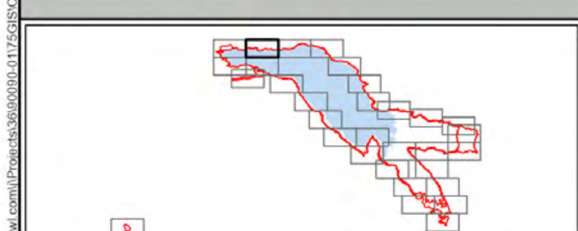
Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.1



Study Area

DOWL Mapped Wetland (Cowardin)

Upland

Wetland Mapping

DOWL Mapped HGM

Depressional

Riverine

Slope

Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.2

Study Area

DOWL Mapped Stream (Cowardin)

R4SBC

DOWL Mapped Wetland (Cowardin)

Upland

Wetland Mapping

DOWL Mapped HGM

Depressional

Riverine

Slope

0 125 250 Feet

Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.3

Study Area

DOWL Mapped Stream (Cowardin)
- R3UBH
- R4SBC

DOWL Mapped Wetland (Cowardin)
- Upland

Wetland Mapping

DOWL Mapped HGM
- Depressional
- Riverine
- Slope

N

0 125 250 Feet

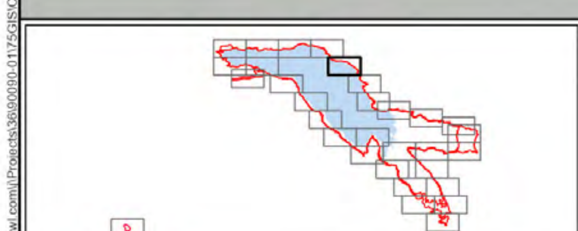
Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.4



Study Area	**DOWL Mapped Stream (Cowardin)**	**DOWL Mapped Wetland (Cowardin)**	Riverine
	R4SBC	Upland	Slope
		Wetland Mapping	
		DOWL Mapped HGM	
		Depressional	

0 125 250 Feet

Wetland Delineation

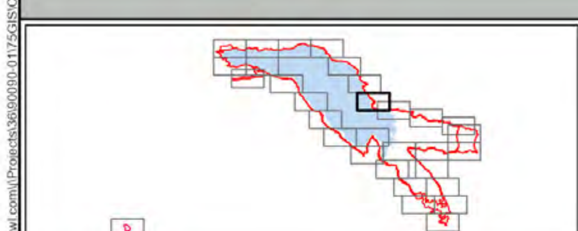
Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.5


Bradley Lake
DOWL Mapped Stream (Cowardin)
Study Area
R4SBC
DOWL Mapped Wetland (Cowardin)
Upland
Wetland Mapping
DOWL Mapped HGM
Depressional
Riverine
Slope
N
0
125
250
Feet
Wetland Delineation
Bradley Lake Wetland Delineation
DOWL ALASKA
Date: October 2024
Figure 4.6



Study Area

DOWL Mapped Stream (Cowardin)

R4SBC

DOWL Mapped Wetland (Cowardin)

Upland

Wetland Mapping

DOWL Mapped HGM

Depressional

Riverine

Slope

Feet
0 125 250

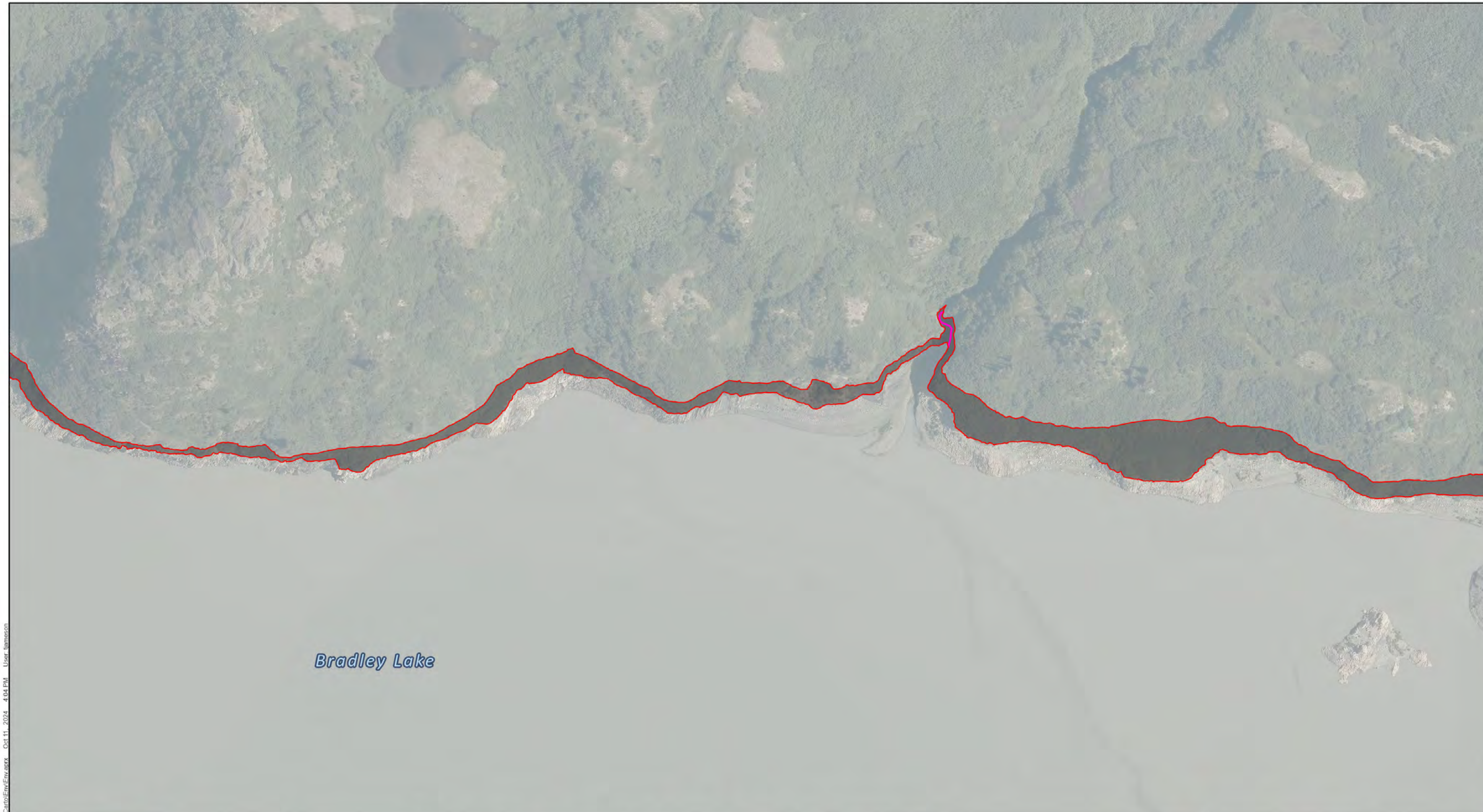
Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.7



Study Area	**DOWL Mapped Stream (Cowardin)** R4SBC	**DOWL Mapped Wetland (Cowardin)** Upland **Wetland Mapping** **DOWL Mapped HGM** Depressional	Riverine Slope

Feet 0 125 250

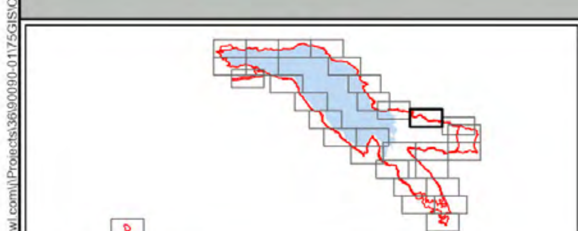
Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.8



Study Area

DOWL Mapped Wetland (Cowardin)

Upland

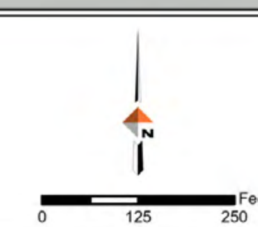
Wetland Mapping

DOWL Mapped HGM

Depressional

Riverine

Slope



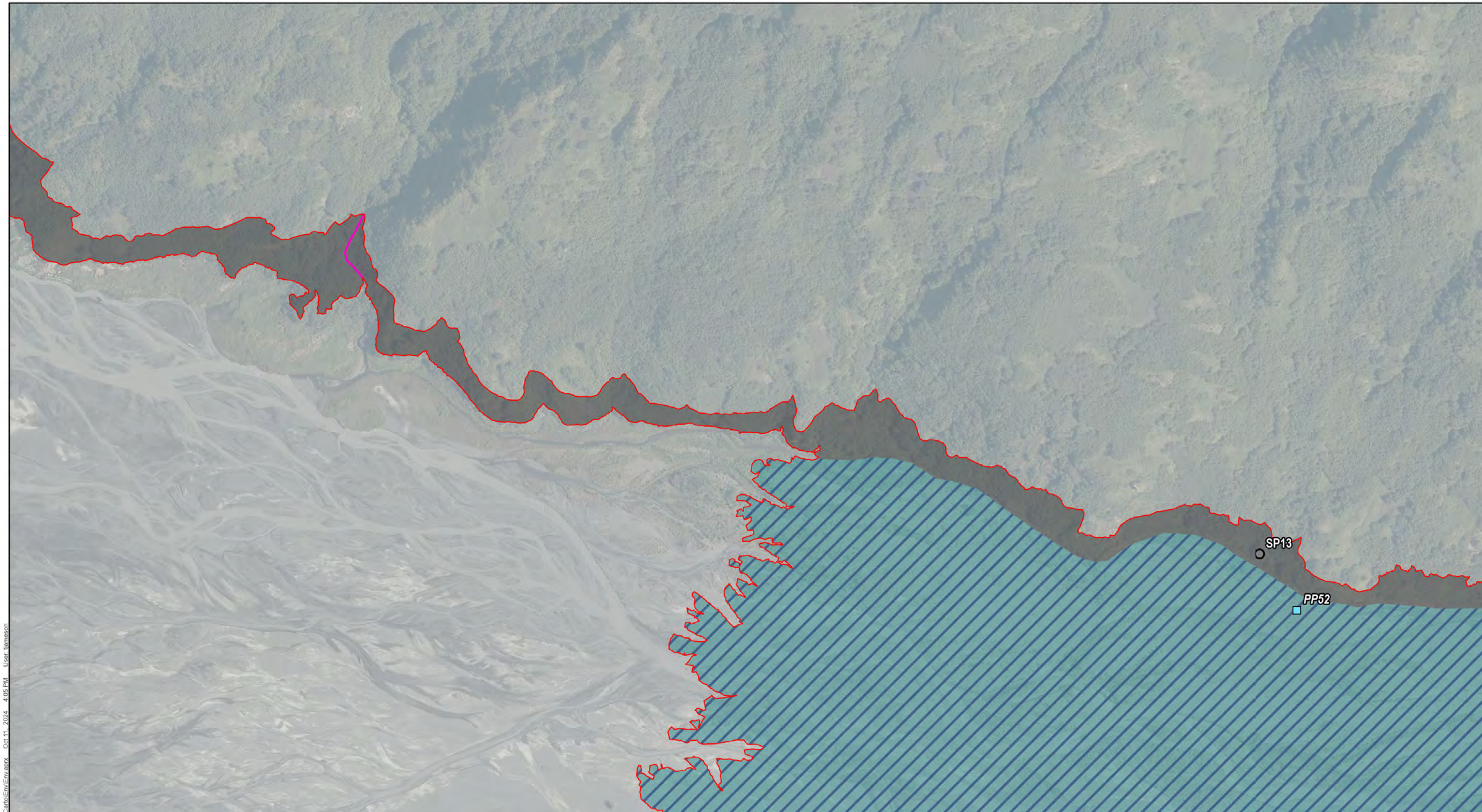
Wetland Delineation

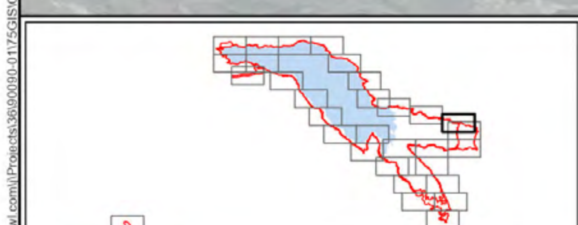
Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.9





Study Area

Field Point
Photo Point (Stream)
Sample Point (Upland)

DOWL Mapped Stream (Cowardin)
R4SBC

DOWL Mapped Wetland (Cowardin)
R3UBH
Upland

DOWL Mapped HGM
Riverine

Wetland Mapping

DOWL Mapped HGM
Depressional
Riverine

Slope

N

0 125 250 Feet

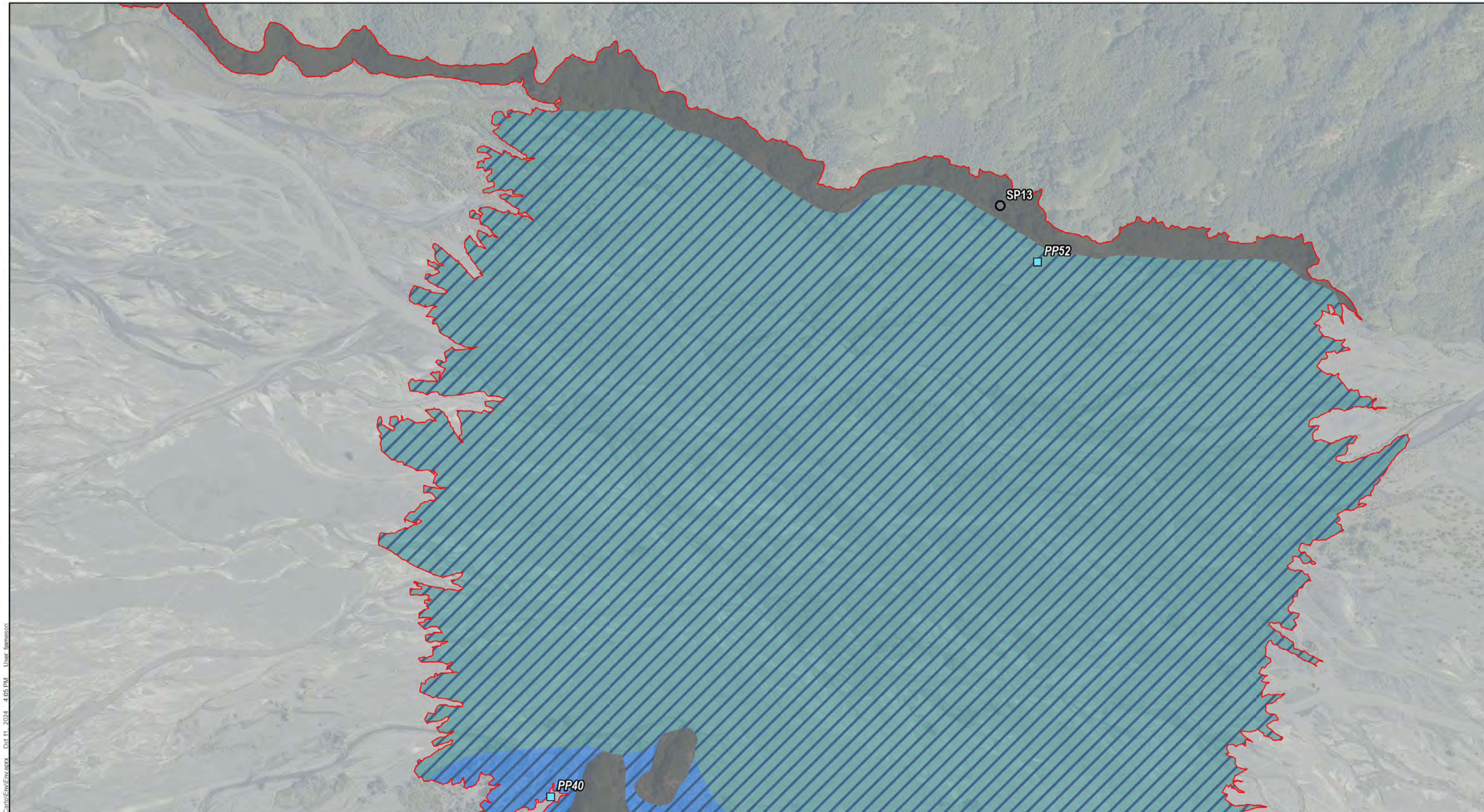
Wetland Delineation

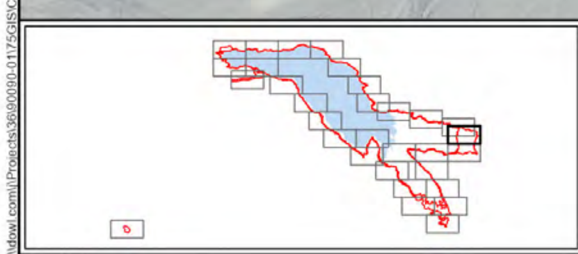
Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.10





Study Area

Field Point
Photo Point (Stream)
Sample Point (Upland)

DOWL Mapped Wetland (Cowardin)
R3UBC
R3UBH
Upland

DOWL Mapped HGM
Riverine

Wetland Mapping

DOWL Mapped HGM
Depressional

Riverine
Slope

N

0 125 250 Feet

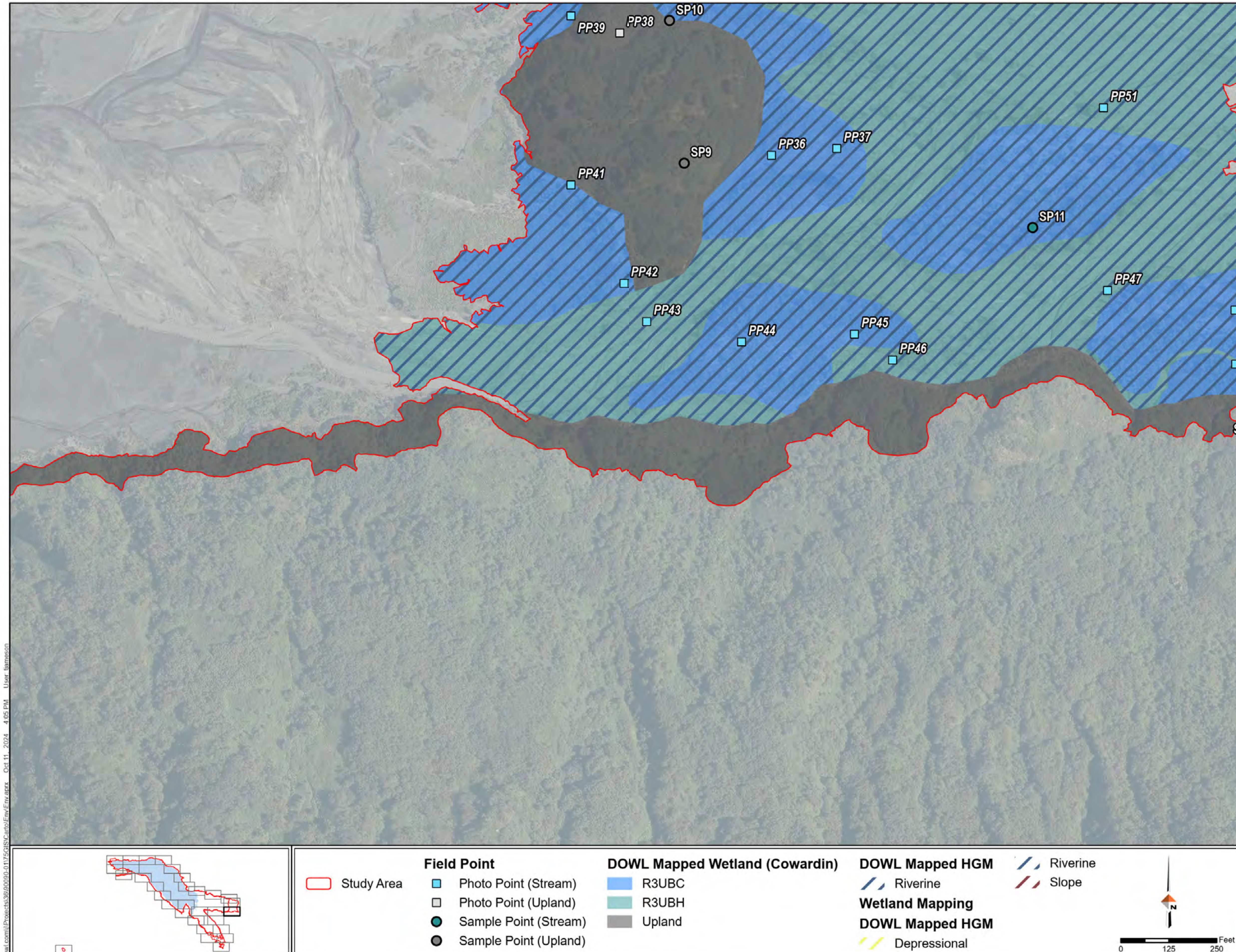
Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.11



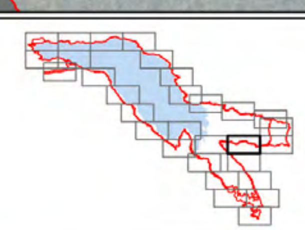
Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.12



Study Area

DOWL Mapped Stream (Cowardin)

R4SBC

DOWL Mapped Wetland (Cowardin)

Upland

Wetland Mapping

DOWL Mapped HGM

Depressional

Riverine

Slope

N

0 125 250 Feet

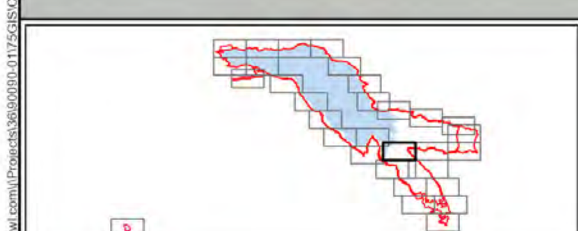
Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.13



Study Area

DOWL Mapped Wetland (Cowardin)

Upland

Wetland Mapping

DOWL Mapped HGM

Depressional

Riverine

Slope

0 125 250 Feet

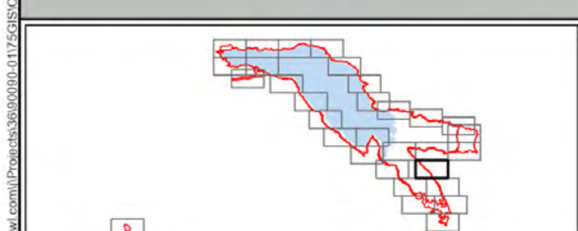
Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.14



Study Area

DOWL Mapped Wetland (Cowardin)

Upland

Wetland Mapping

DOWL Mapped HGM

Depressional

Riverine

Slope

N

Feet
0 125 250

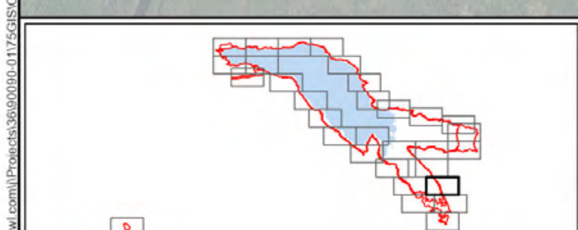
Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.15



Study Area

DOWL Mapped Stream (Cowardin)

R4SBC

DOWL Mapped Wetland (Cowardin)

R3UBC

R3UBH

Upland

DOWL Mapped HGM

Riverine

Wetland Mapping

DOWL Mapped HGM

Depressional

Riverine

Slope

N

0 125 250 Feet

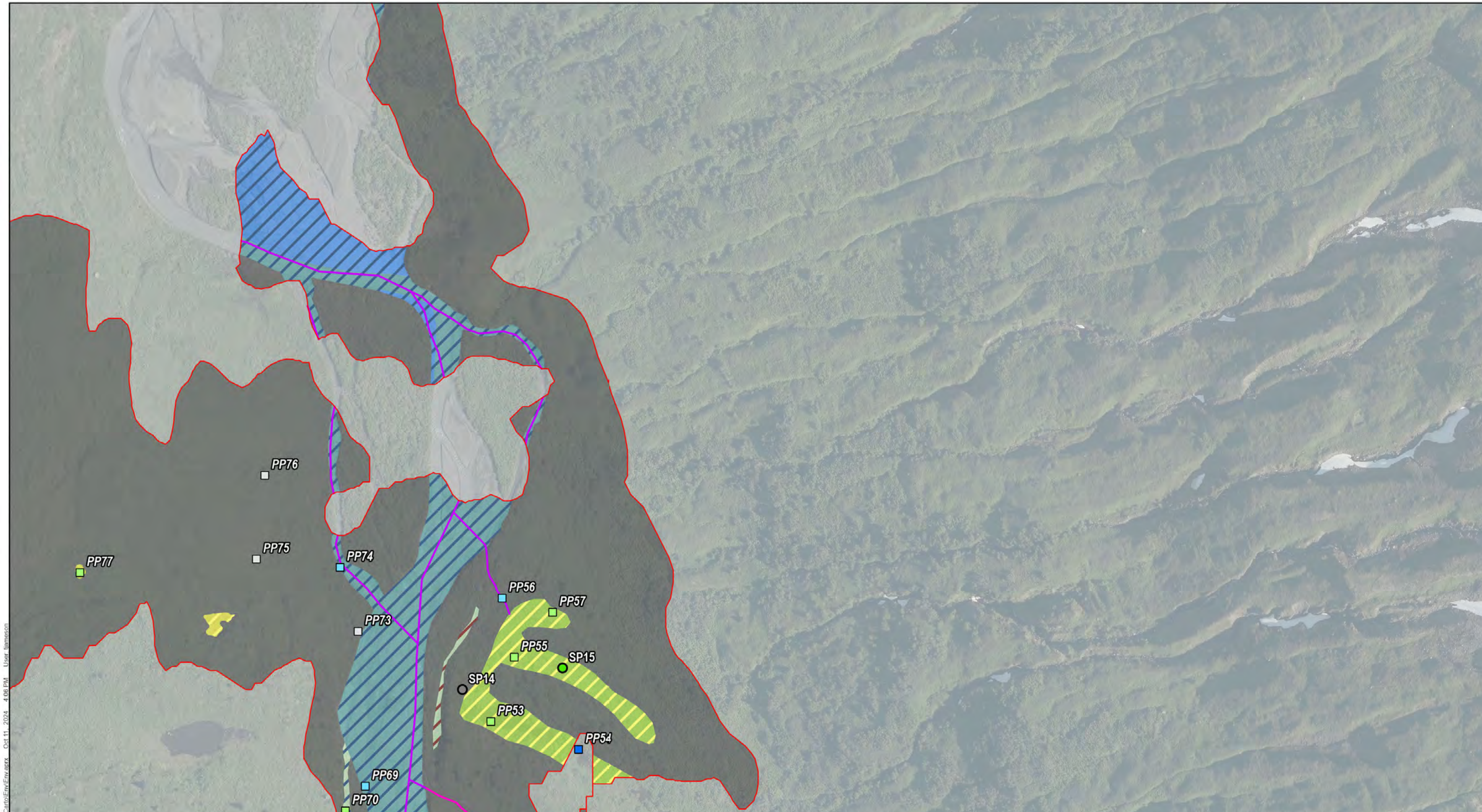
Wetland Delineation

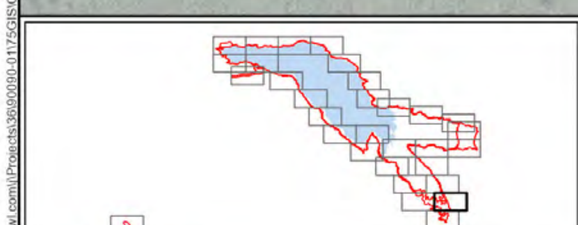
Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.16





Field Point
Study Area
Photo Point (Stream)
Photo Point (Upland)
Photo Point (Water)
Photo Point (Wetland)
Sample Point (Upland)
Sample Point (Wetland)

DOWL Mapped Stream (Cowardin)
R3UBH
R4SBC

DOWL Mapped Wetland (Cowardin)
PEM1C
PSS1/EM1C
PSS1C
R3UBC
R3UBH
Upland

DOWL Mapped HGM
Depressional
Riverine
Slope

Wetland Mapping
DOWL Mapped HGM
Depressional
Riverine
Slope

0 125 250 Feet

N

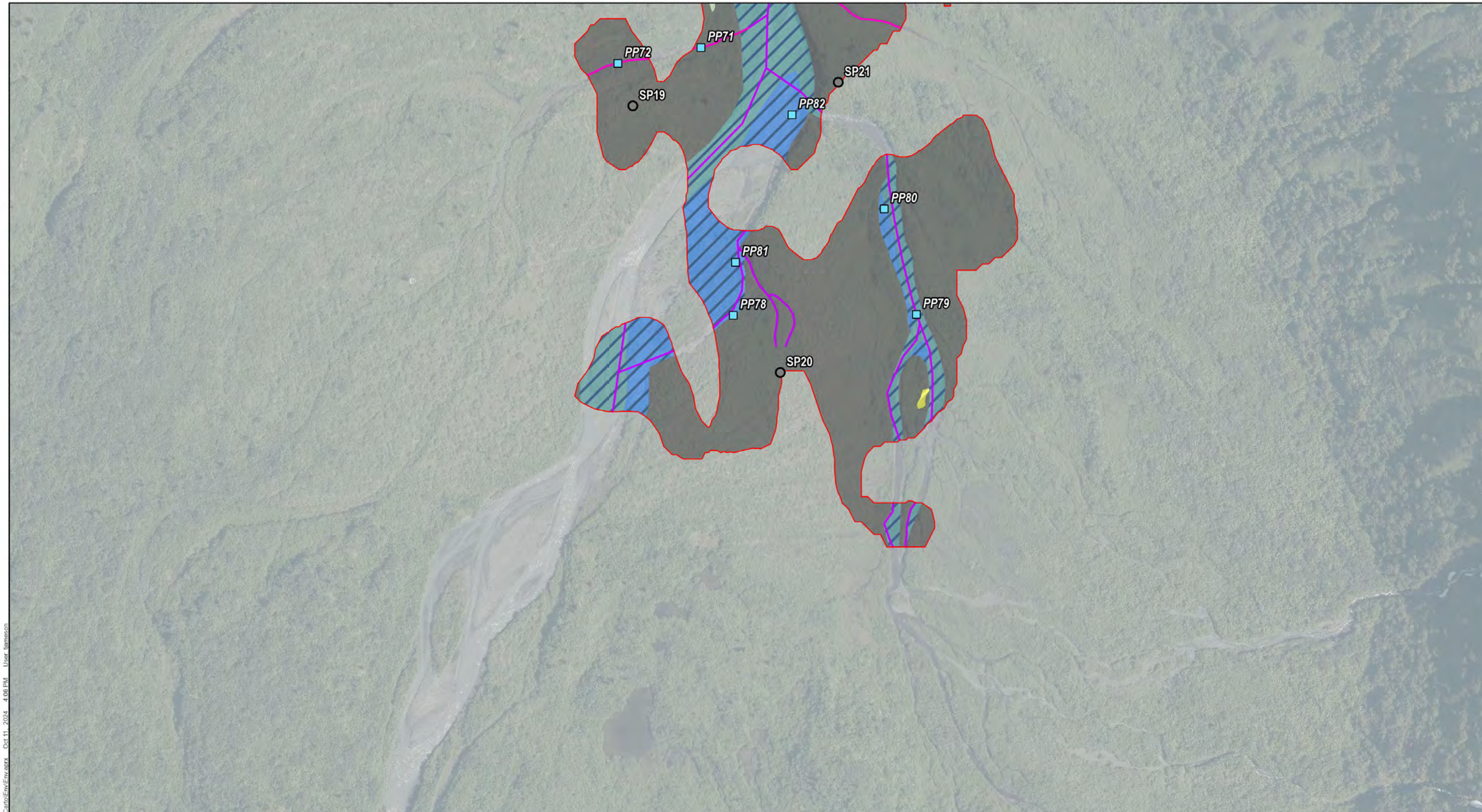
Wetland Delineation

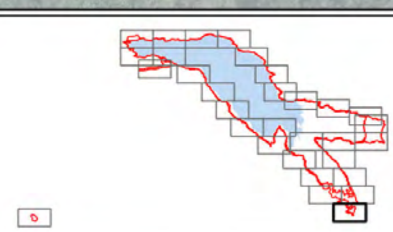
Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.17





Study Area

Field Point

Photo Point (Stream)

Sample Point (Upland)

DOWL Mapped Stream (Cowardin)

R3UBH

R4SBC

DOWL Mapped Wetland (Cowardin)

PEM1C

PSS1C

R3UBC

R3UBH

Upland

DOWL Mapped HGM

Depressional

Riverine

Wetland Mapping

DOWL Mapped HGM

Depressional

Riverine

Slope

N

0 125 250 Feet

Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.18

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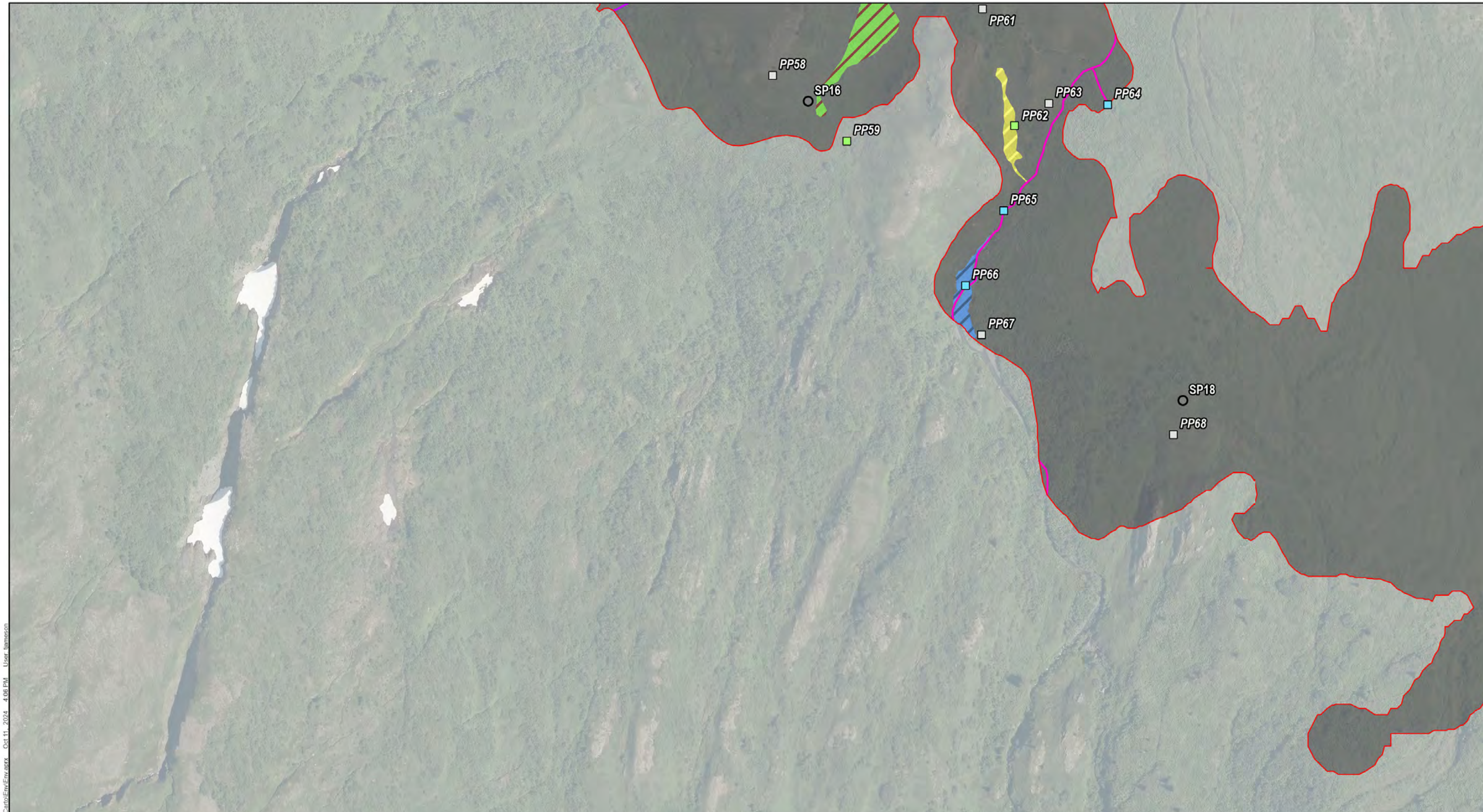
Imagery Credits:



Study Area

Field Point
- Photo Point (Stream)
- Photo Point (Upland)
- Photo Point (Wetland)
- Sample Point (Upland)

DOWL Mapped Stream (Cowardin)
- R3UBH
- R4SBC

DOWL Mapped Wetland (Cowardin)
- PEM1C
- PSS1B
- R3UBC
- R3UBH
- Upland

DOWL Mapped HGM
- Depressional
- Riverine
- Slope

Wetland Mapping

DOWL Mapped HGM
- Depressional
- Riverine
- Slope

N

0 125 250 Feet

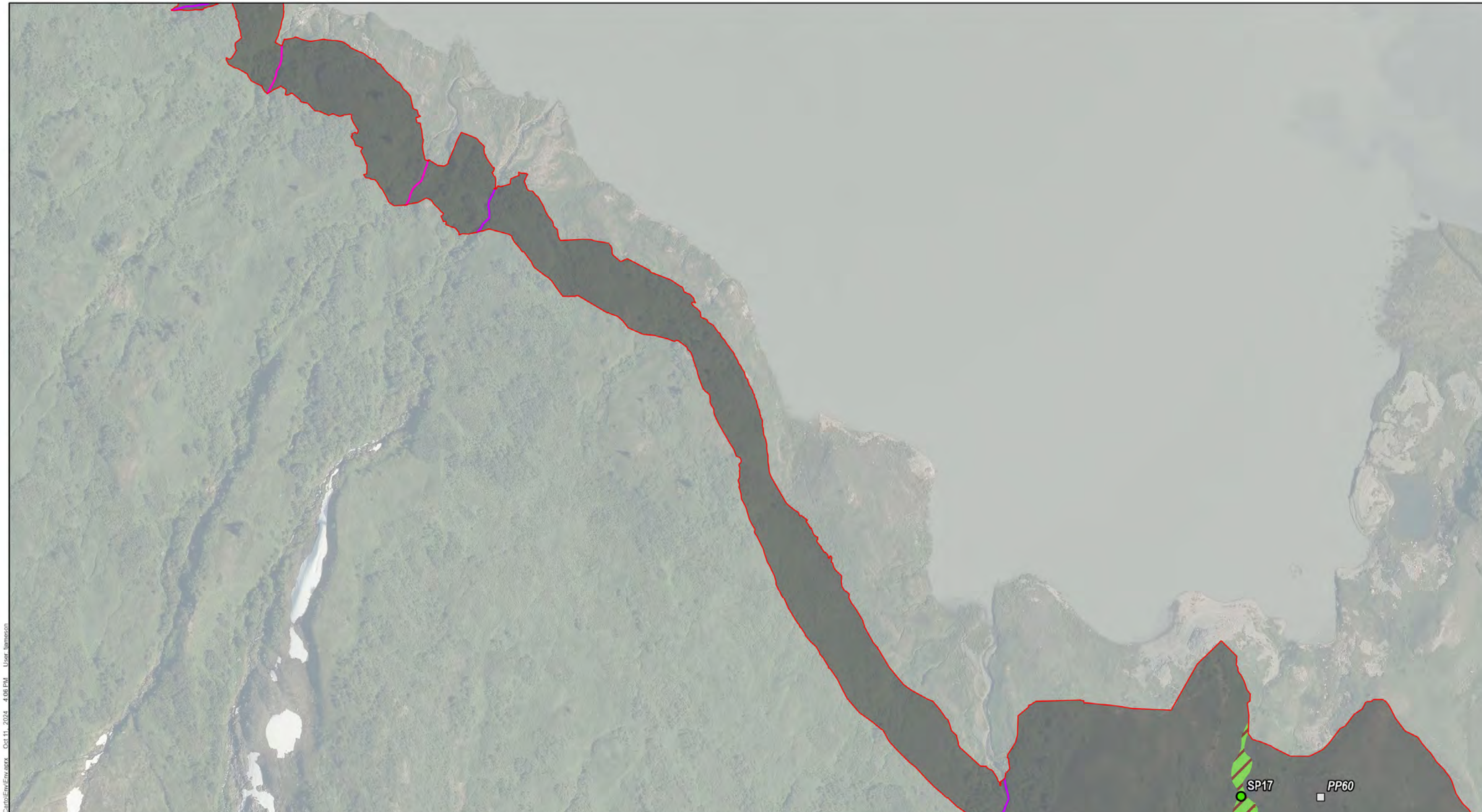
Wetland Delineation

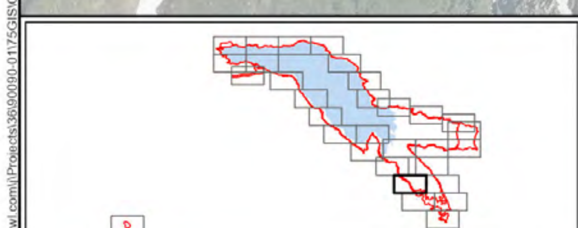
Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.19





Study Area

Field Point

Photo Point (Upland)

Sample Point (Wetland)

DOWL Mapped Stream (Cowardin)

R3UBH

R4SBC

DOWL Mapped Wetland (Cowardin)

PSS1B

Upland

DOWL Mapped HGM

Slope

Wetland Mapping

DOWL Mapped HGM

Depressional

Riverine

Slope

0 125 250 Feet

N

Wetland Delineation

Bradley Lake Wetland Delineation

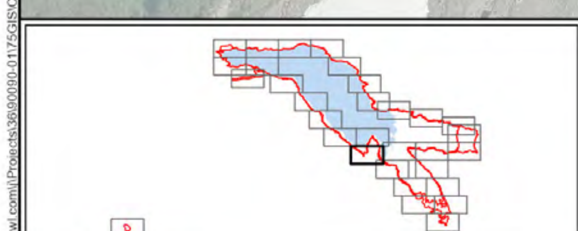
DOWL ALASKA

Date: October 2024

Figure 4.20

Oct 11, 2024 4:06 PM User: jameson


Study Area
DOWL Mapped Stream (Cowardin)
R3UBH
R4SBC
DOWL Mapped Wetland (Cowardin)
Upland
Wetland Mapping
DOWL Mapped HGM
Depressional
Riverine
Slope
N
0
125
250
Feet
Wetland Delineation
Bradley Lake Wetland Delineation
DOWL ALASKA
Date: October 2024
Figure 4.21



Study Area	**DOWL Mapped Stream (Cowardin)**	**DOWL Mapped Wetland (Cowardin)**	Riverine
	R4SBC	Upland	Slope
		Wetland Mapping	
		DOWL Mapped HGM	
		Depressional	

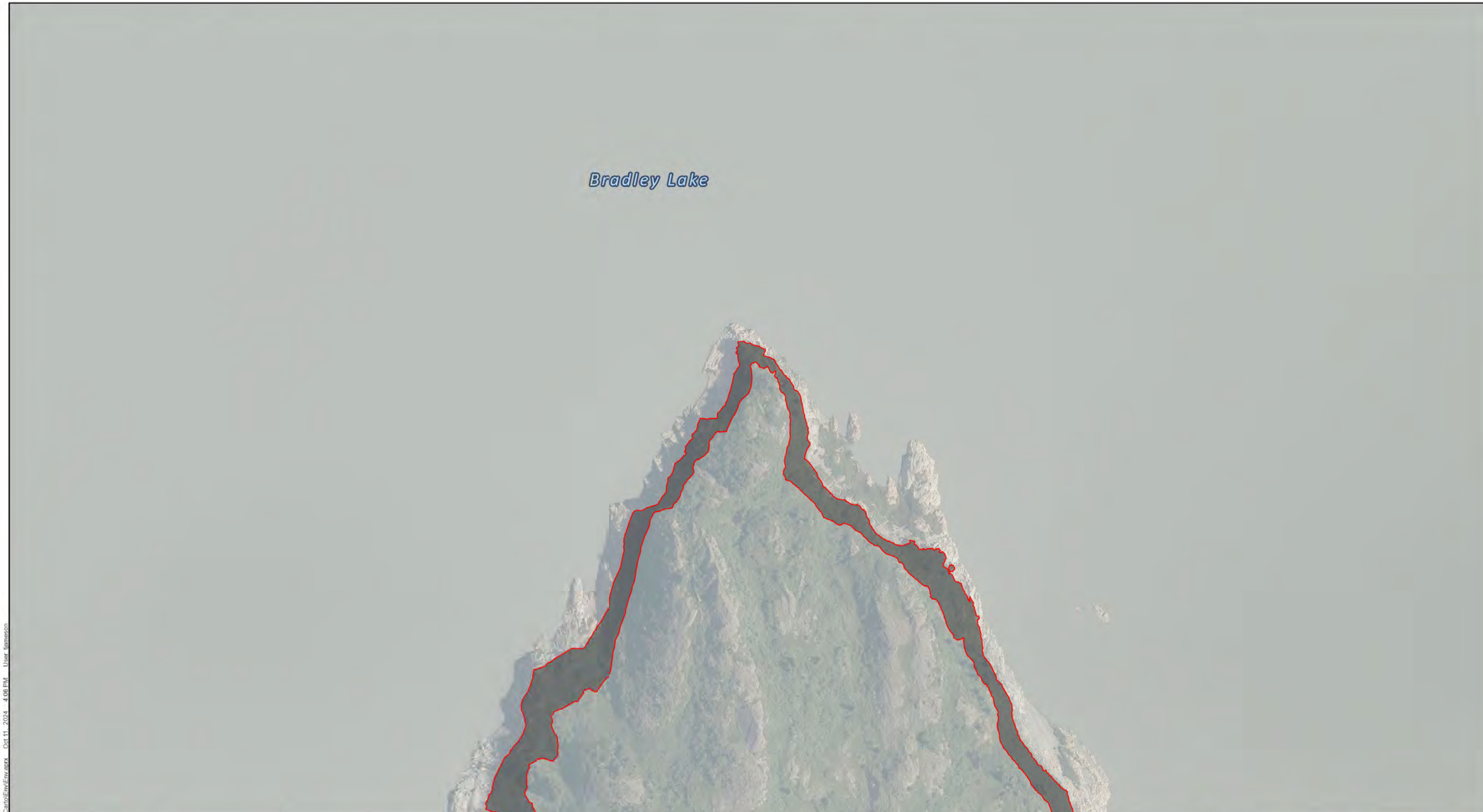
Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.22



Study Area

DOWL Mapped Wetland (Cowardin)

Upland

Wetland Mapping

DOWL Mapped HGM

Depressional

Riverine

Slope

N

0 125 250 Feet

Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.23

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Study Area

DOWL Mapped Stream (Cowardin)

R3UBH

DOWL Mapped Wetland (Cowardin)

Upland

Wetland Mapping

DOWL Mapped HGM

Depressional

Riverine

Slope

N

0 125 250 Feet

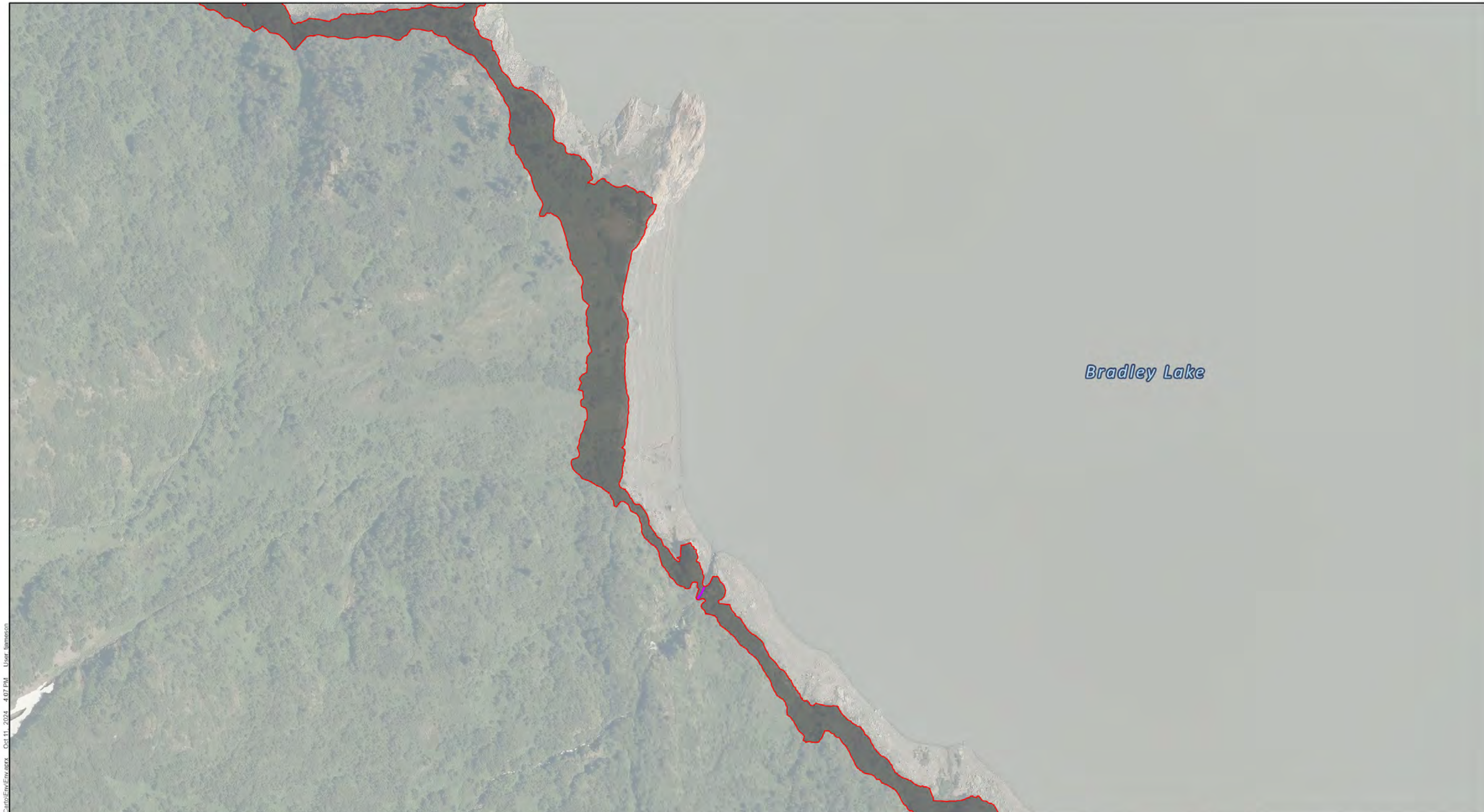
Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.24



Study Area

DOWL Mapped Stream (Cowardin)

R3UBH

DOWL Mapped Wetland (Cowardin)

Upland

Wetland Mapping

DOWL Mapped HGM

Depressional

Riverine

Slope

Feet

0 125 250

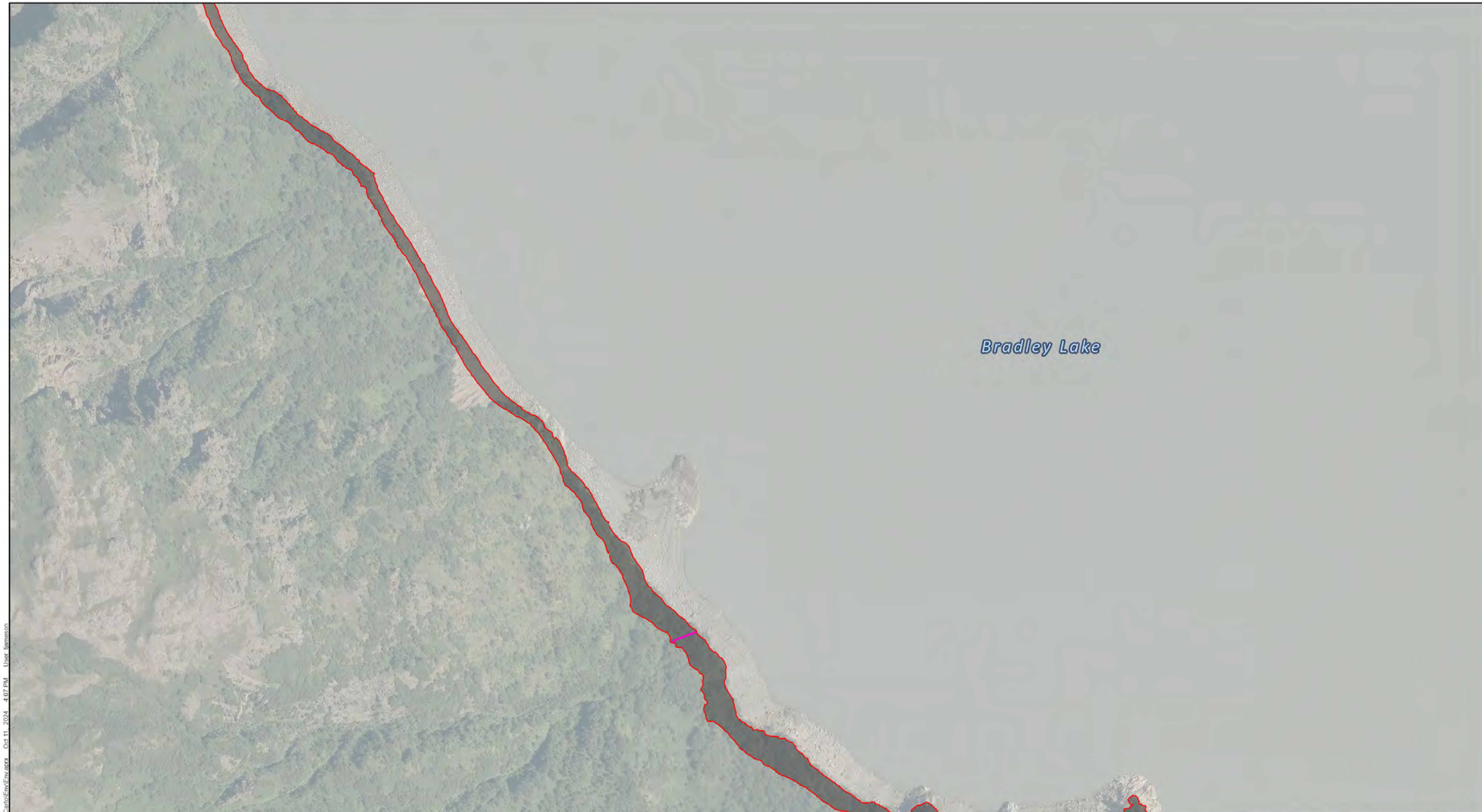
Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.25



Study Area

DOWL Mapped Stream (Cowardin)

R4SBC

DOWL Mapped Wetland (Cowardin)

Upland

Wetland Mapping

DOWL Mapped HGM

Depressional

Riverine

Slope

0 125 250 Feet

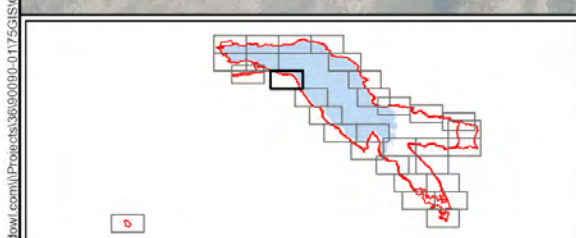
Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.26



Study Area

DOWL Mapped Stream (Cowardin)

R4SBC

DOWL Mapped Wetland (Cowardin)

Upland

Wetland Mapping

DOWL Mapped HGM

Depressional

Riverine

Slope

N

0 125 250 Feet

Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.27

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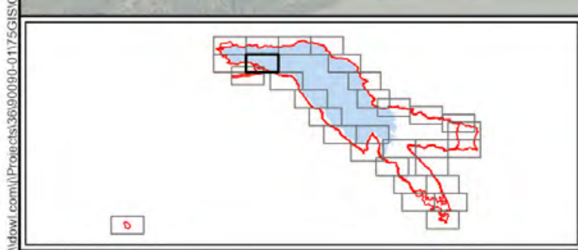
Imagery Credits



Study Area

Field Point
- Photo Point (Stream)
- Photo Point (Upland)
- Photo Point (Water)
- Photo Point (Wetland)
- Sample Point (Upland)
- Sample Point (Wetland)

DOWL Mapped Stream (Cowardin)
- R3UBH
- R4SBC

DOWL Mapped Wetland (Cowardin)
- PSS1B
- PSS1C
- PUBH
- R3UBH
- Upland

DOWL Mapped HGM
- Riverine
- Slope

Wetland Mapping

DOWL Mapped HGM
- Depressional
- Riverine

- Slope

N

0 125 250 Feet

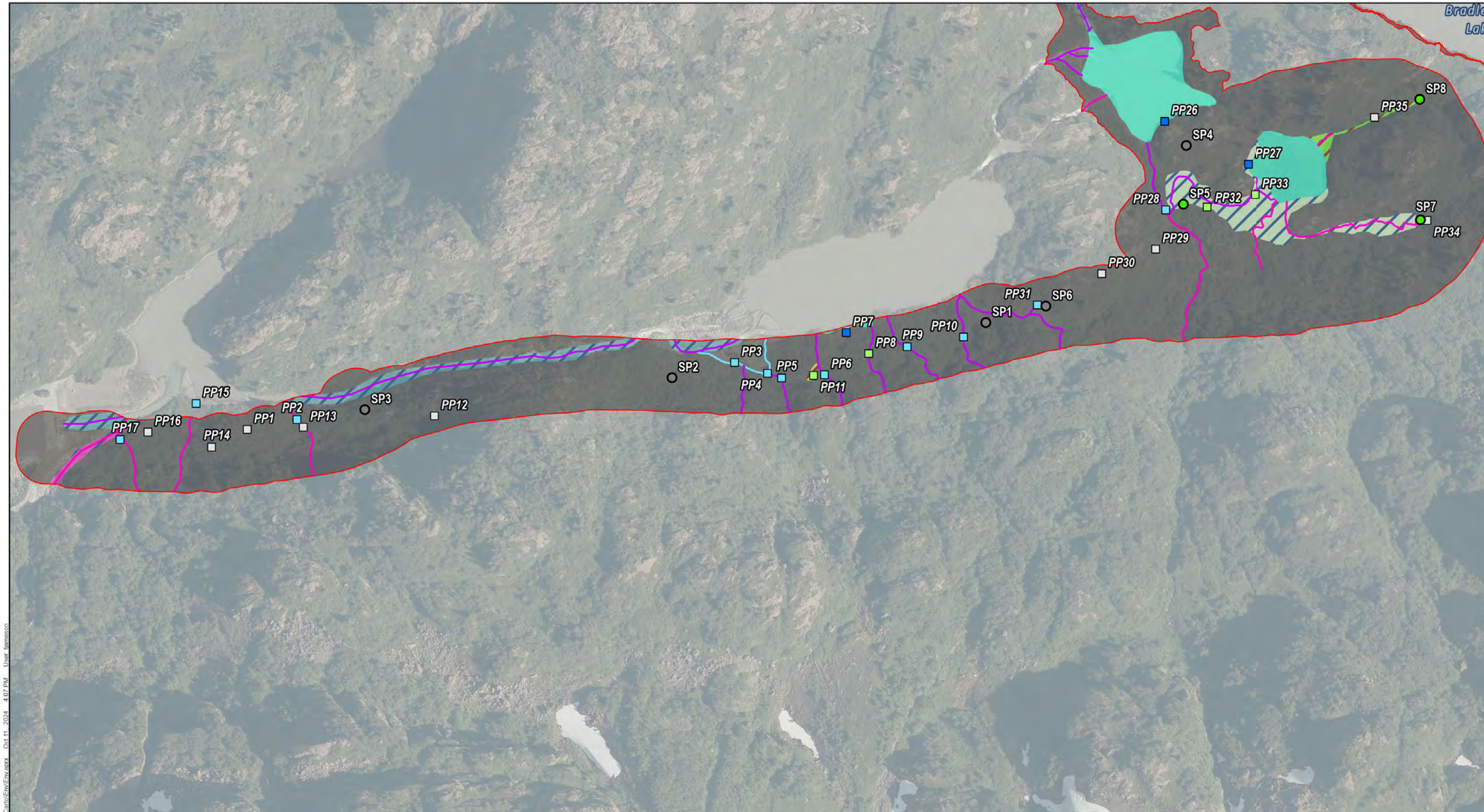
Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.28



Study Area	**Field Point**	**DOWL Mapped Stream (Cowardin)**	**DOWL Mapped Wetland (Cowardin)**	**DOWL Mapped HGM**	Slope
	Photo Point (Stream)	R3UBC	PEM1C	Riverine	
	Photo Point (Upland)	R3UBH	PSS1B	Slope	
	Photo Point (Water)	R4SBC	PSS1C	**Wetland Mapping**	
	Photo Point (Wetland)		PUBH	**DOWL Mapped HGM**	
	Sample Point (Upland)		R3UBH	Depressional	
	Sample Point (Wetland)		R4SBC	Riverine	
			Upland		

N

0 125 250 Feet

Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.29

Study Area

DOWL Mapped Wetland (Cowardin)

Upland

Wetland Mapping

DOWL Mapped HGM

Depressional

Riverine

Slope

N

Feet
0 125 250

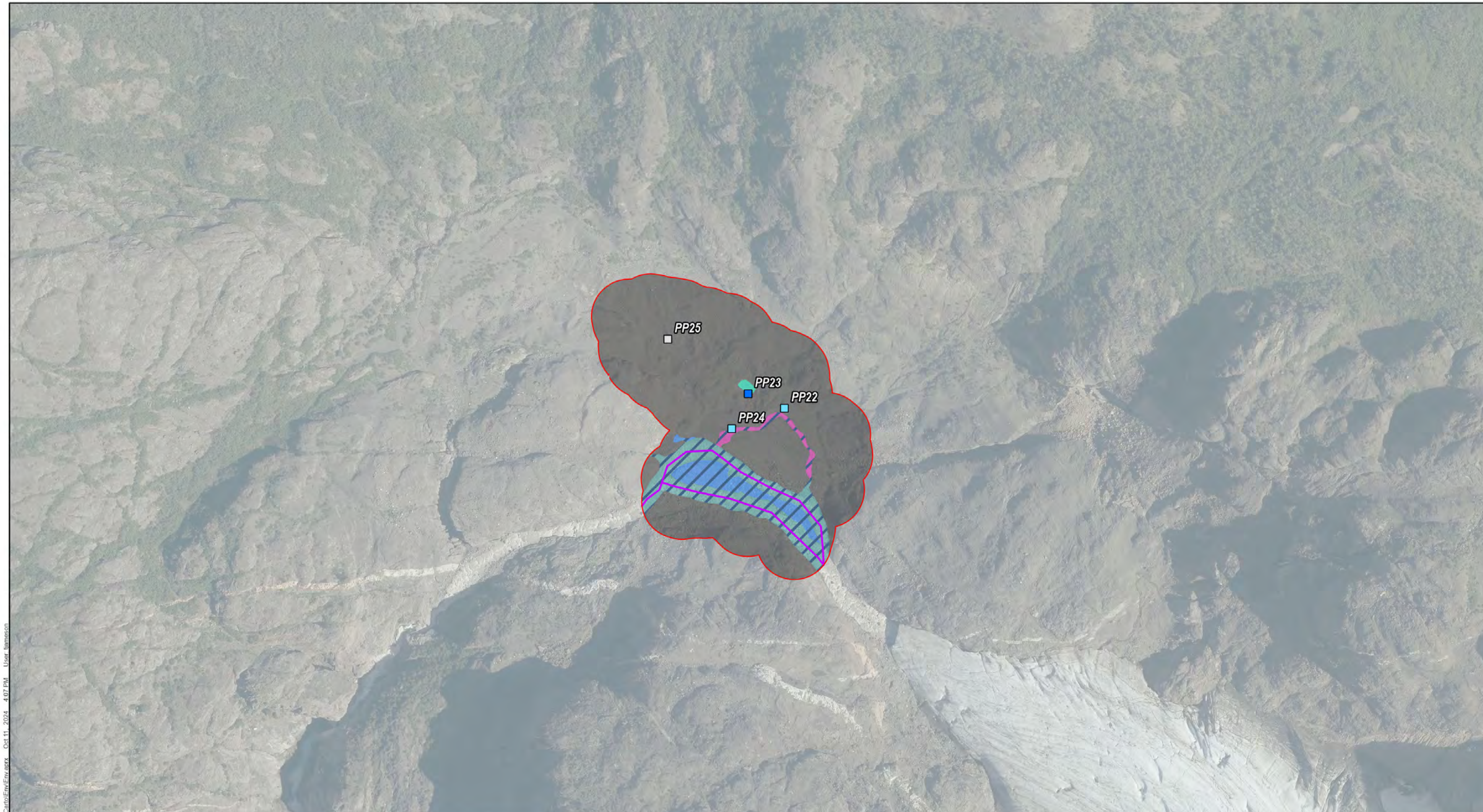
Wetland Delineation

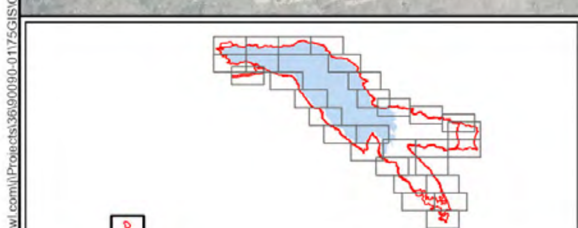
Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.30





Study Area

Field Point

Photo Point (Stream)

Photo Point (Upland)

Photo Point (Water)

DOWL Mapped Stream (Cowardin)

R3UBH

DOWL Mapped Wetland (Cowardin)

PUBH

R3UBC

R3UBH

R4SBC

Upland

DOWL Mapped HGM

Riverine

Wetland Mapping

DOWL Mapped HGM

Depressional

Riverine

Slope

Feet

0 125 250

Wetland Delineation

Bradley Lake Wetland Delineation

DOWL ALASKA

Date: October 2024

Figure 4.31

Appendix C

USACE Data Sheets, Photo Log, and All Observed Plant Species

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Alaska Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***OMB Control #: 0710-0024, Exp: 11/30/2024*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: AEA Bradley-Dixon Borough/City: Homer Sampling Date: 7/29/2024

Applicant/Owner: AEA Sampling Point: 1

Investigator(s): JRG, EGA Landform (hillside, terrace, hummocks, etc.): hillside

Local relief (concave, convex, none): concave Slope (%): 1-3

Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains) Lat: 59.745633 Long: -150.834833 Datum: WGS84

Soil Map Unit Name: N/A NWI classification: Upland

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

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

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

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

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

Remarks:
Dry season and APT shows normal conditions

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1. *Salix pulchra*	25	Yes	FACW
2. *Empetrum nigrum*	30	Yes	FAC
3. *Rubus arcticus*	5	No	FAC
4. *Alnus viridis*	3	No	FAC
5.			
6.			
	63	=Total Cover	
50% of total cover: 32		20% of total cover: 13	
Herb Stratum			
1. *Chamaenerion angustifolium*	40	Yes	FACU
2. *Eurybia sibirica*	10	No	FAC
3. *Carex pluriflora*	5	No	OBL
4. *Veratrum viride*	2	No	FAC
5. *Calamagrostis canadensis*	35	Yes	FAC
6. *Sanguisorba canadensis*	15	No	FACW
7. *Equisetum pratense*	5	No	FACW
8. *Trientalis europaea*	2	No	FACU
9. *Petasites frigidus*	1	No	FACW
10. *Eriophorum angustifolium*	10	No	OBL
	130	=Total Cover	
50% of total cover: 65		20% of total cover: 26	

Plot Size (radius, or length x width) 1/10 acre % Bare Ground 0

% Cover of Wetland Bryophytes 0 Total Cover of Bryophytes ___
(Where applicable)

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	15	x 1 =	15
FACW species	51	x 2 =	102
FAC species	85	x 3 =	255
FACU species	42	x 4 =	168
UPL species	0	x 5 =	0
Column Totals:	193 (A)		540 (B)

Prevalence Index = B/A = 2.80

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

VEGETATION Continued – Use scientific names of plants.

Sampling Point: 1

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
	63	=Total Cover	
50% of total cover: 32		20% of total cover:	13

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
11. *Swertia perennis*	2	No	FACW
12. *Viola palustris*	3	No	FACW
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
	130	=Total Cover	
50% of total cover: 65		20% of total cover:	26

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH, regardless of height.

Herb – All herbaceous (non-woody) plants, regardless of size.

Remarks:

SOIL

Sampling Point: 1

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-3							Peat	Fibric
3-8	10YR 4/2	100					Mucky Loam/Clay	silt loam
8-11	10YR 4/4	70	2.5Y 6/6	30	C	PL	Mucky Loam/Clay	Distinct redox concentrations
11-16	10YR 5/4	100					Loamy/Clayey	10% cobbles
16-24	2.5YR 4/6	100					Loamy/Clayey	70% cobbles

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

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

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

[4]Give details of color change in Remarks.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

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

Remarks:
11-16" layer has living roots. 0-3" layer has thin organics.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?		X	
Water Table Present?	X		23
Saturation Present? (includes capillary fringe)	X		5

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

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

Remarks:
Seep nearby

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Alaska Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***OMB Control #: 0710-0024, Exp: 11/30/2024*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: AEA Bradley-Dixon Borough/City: Homer Sampling Date: 7/29/2024

Applicant/Owner: AEA Sampling Point: 2

Investigator(s): JRG, EGA Landform (hillside, terrace, hummocks, etc.): hillside

Local relief (concave, convex, none): concave Slope (%): 5-8

Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains) Lat: 59.745198 Long: -150.839395 Datum: WGS84

Soil Map Unit Name: N/A NWI classification: Upland

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

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

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

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

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

Remarks:
Dry season and APT shows normal conditions

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1. *Vaccinium uliginosum*	20	Yes	FAC
2. *Alnus incana*	10	Yes	FAC
3. *Sorbus scopulina*	5	No	FACU
4. *Rubus pedatus*	3	No	FAC
5. *Oplopanax horridus*	10	Yes	FACU
6.			
	48	=Total Cover	
50% of total cover: 24		20% of total cover: 10	
Herb Stratum			
1. *Calamagrostis canadensis*	5	No	FAC
2. *Athyrium cyclosorum*	15	No	FAC
3. *Veratrum viride*	25	Yes	FAC
4. *Sanguisorba canadensis*	10	No	FACW
5. *Rubus arcticus*	30	Yes	FAC
6.			
7.			
8.			
9.			
10.			
	85	=Total Cover	
50% of total cover: 43		20% of total cover: 17	

Plot Size (radius, or length x width) 1/10 acre % Bare Ground 0

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	108	x 3 =	324
FACU species	15	x 4 =	60
UPL species	0	x 5 =	0
Column Totals:	133 (A)		404 (B)

Prevalence Index = B/A = 3.04

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

SOIL

Sampling Point: 2

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4							Peat	Fibric
4-8	10YR 2/2	100					Loamy/Clayey	
8-18	10YR 3/3	100					Loamy/Clayey	10% organic inclusions, 70% cobbles
18-24	10YR 2/2	100					Loamy/Clayey	

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

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Remarks:

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Alaska Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***OMB Control #: 0710-0024, Exp: 11/30/2024*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: AEA Bradley-Dixon Borough/City: Homer Sampling Date: 7/29/2024

Applicant/Owner: AEA Sampling Point: 3

Investigator(s): JRG, EGA Landform (hillside, terrace, hummocks, etc.): hillside

Local relief (concave, convex, none): non Slope (%): 1-3

Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains) Lat: 59.744935 Long: -150.843870 Datum: WGS84

Soil Map Unit Name: N/A NWI classification: R5UBH

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

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

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

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

Hydrophytic Vegetation Present?	Yes X	No ___
Hydric Soil Present?	Yes ___	No X
Wetland Hydrology Present?	Yes ___	No X

Is the Sampled Area within a Wetland? **Yes** ___ **No** X

Remarks:
Dry season and APT shows normal conditions

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1. *Alnus incana*	60	Yes	FAC
2. *Salix pulchra*	20	Yes	FACW
3. *Vaccinium uliginosum*	5	No	FAC
4. *Rubus pedatus*	5	No	FAC
5. *Oplopanax horridus*	10	No	FACU
6.			
	100	=Total Cover	
50% of total cover:	50	20% of total cover:	20
Herb Stratum			
1. *Solidago simplex*	5	No	UPL
2. *Trientalis europaea*	15	Yes	FACU
3. *Veratrum viride*	10	Yes	FAC
4. *Calamagrostis canadensis*	5	No	FAC
5. *Viola palustris*	10	Yes	FACW
6. *Sanguisorba canadensis*	5	No	FACW
7.			
8.			
9.			
10.			
	50	=Total Cover	
50% of total cover:	25	20% of total cover:	10

Plot Size (radius, or length x width) 1/10th acre % Bare Ground 0

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	4	(A)
Total Number of Dominant Species Across All Strata:	5	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	80.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	35	x 2 =	70
FAC species	85	x 3 =	255
FACU species	25	x 4 =	100
UPL species	5	x 5 =	25
Column Totals:	150 (A)		450 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

SOIL

Sampling Point: 3

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2							Peat	fibric
2-5	10YR 3/4	100					Mucky Sand	
5-8	10YR 3/2	100					Mucky Sand	
8-20	10YR 3/4	60					Sandy	40% cobbles, rock restriction
20-24	2.5Y 4/4	40					Sandy	60% cobbles

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

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

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

[4]Give details of color change in Remarks.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

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

Remarks:
Bright upland soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

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

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

Remarks:
Well drained

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Alaska Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp: 11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: AEA Bradley-Dixon   Borough/City: Homer   Sampling Date: 7/30/2024

Applicant/Owner: AEA   Sampling Point: 4

Investigator(s): JRG, EGA   Landform (hillside, terrace, hummocks, etc.): valley bottom

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

Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains)   Lat: 59.746955   Long: -150.831944   Datum: WGS84

Soil Map Unit Name: N/A   NWI classification: Upland

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

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

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

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

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

Remarks:
Dry season and APT shows normal conditions

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1. *Empetrum nigrum*	70	Yes	FAC
2. *Vaccinium uliginosum*	10	No	FAC
3. *Rubus pedatus*	15	No	FAC
4. *Sanguisorba canadensis*	2	No	FACW
5. *Vaccinium vitis-idaea*	10	No	FAC
6.			
	107	=Total Cover	
50% of total cover:	54	20% of total cover:	22
Herb Stratum			
1. *Chamaenerion angustifolium*	5	Yes	FACU
2. *Eurybia sibirica*	2	No	FAC
3. *Veratrum viride*	2	No	FAC
4. *Trientalis europaea*	2	No	FACU
5. *Viola palustris*	5	Yes	FACW
6. *Calamagrostis canadensis*	10	Yes	FAC
7. *Artemisia tilesii*	5	Yes	FACU
8.			
9.			
10.			
	31	=Total Cover	
50% of total cover:	16	20% of total cover:	7

Plot Size (radius, or length x width) 1/10th acre   % Bare Ground 0

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

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	7	x 2 =	14
FAC species	119	x 3 =	357
FACU species	12	x 4 =	48
UPL species	0	x 5 =	0
Column Totals:	138 (A)		419 (B)

Prevalence Index = B/A = 3.04

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:
lichen 5%

SOIL

Sampling Point: 4

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-3							Peat	fibric
3-12	10YR 3/3	60	10YR 2/2	40	D	PL/M	Loamy/Clayey	
12-24	10YR 3/4	90					Loamy/Clayey	10% gravels

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

Hydric Soil Indicators:
- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:
- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

Secondary Indicators (2 or more required)
- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Remarks:

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Alaska Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp: 11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: AEA Bradley-Dixon Borough/City: Homer Sampling Date: 7/30/2024

Applicant/Owner: AEA Sampling Point: 5

Investigator(s): JRG, EGA Landform (hillside, terrace, hummocks, etc.): swale

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

Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains) Lat: 59.746523 Long: -150.831976 Datum: WGS84

Soil Map Unit Name: N/A NWI classification: Upland

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

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

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

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

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

Remarks:
Problematic soils, gravely soils with low organic-carbon content with persistent soil satuation during growing season. Dry season and APT shows normal conditions

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1. *Salix pulchra*	35	Yes	FACW
2. *Rubus pedatus*	20	Yes	FAC
3. *Salix barclayi*	25	Yes	FAC
4. *Vaccinium uliginosum*	15	No	FAC
5.			
6.			
	95	=Total Cover	
50% of total cover:	48	20% of total cover:	19
Herb Stratum			
1. *Platanthera aquilonis*	10	No	FACW
2. *Sanguisorba canadensis*	20	Yes	FACW
3. *Eurybia sibirica*	5	No	FAC
4. *Viola palustris*	15	No	FACW
5. *Calamagrostis canadensis*	25	Yes	FAC
6. *Swertia perennis*	3	No	FACW
7.			
8.			
9.			
10.			
	78	=Total Cover	
50% of total cover:	39	20% of total cover:	16

Plot Size (radius, or length x width) 1/10th acre % Bare Ground 0

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	83	x 2 =	166
FAC species	90	x 3 =	270
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	173 (A)		436 (B)

Prevalence Index = B/A = 2.52

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

SOIL

Sampling Point: 5

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4							Peat	Fibric
4-24	7.5YR 3/2	100					Loamy/Clayey	90% gravels, living roots

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

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- X Other (Explain in Remarks)

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

[4]Give details of color change in Remarks.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

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

Remarks:

Problematic gravely soils, soils with low organic-carbon content. AA is negative

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ___	No ___	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 9
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 6

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

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

Remarks:

Low spot near ponds, AA is negative.

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: AEA Bradley-Dixon Borough/City: Homer Sampling Date: 7/30/2024

Applicant/Owner: AEA Sampling Point: 6

Investigator(s): JRG, EGA Landform (hillside, terrace, hummocks, etc.): hillside

Local relief (concave, convex, none): concave Slope (%): 3-5

Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains) Lat: 59.745760 Long: -150.833961 Datum: WGS84

Soil Map Unit Name: N/A NWI classification: Upland

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

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

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

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

Hydrophytic Vegetation Present?	Yes X	No ___
Hydric Soil Present?	Yes ___	No X
Wetland Hydrology Present?	Yes ___	No X

Is the Sampled Area within a Wetland? **Yes** ___ **No** X

Remarks:
Dry season and APT shows normal conditions

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1. *Rubus spectabilis*	40	Yes	FACU
2. *Alnus incana*	10	No	FAC
3. *Vaccinium uliginosum*	10	No	FAC
4. *Sorbus scopulina*	5	No	FACU
5. *Rubus pedatus*	10	No	FAC
6.			
	75	=Total Cover	
50% of total cover:	38	20% of total cover:	15
Herb Stratum			
1. *Veratrum viride*	10	Yes	FAC
2. *Chamaenerion angustifolium*	5	No	FACU
3. *Athyrium cyclosorum*	5	No	FAC
4. *Calamagrostis canadensis*	20	Yes	FAC
5. *Trientalis europaea*	5	No	FACU
6. *Viola palustris*	10	Yes	FACW
7.			
8.			
9.			
10.			
	55	=Total Cover	
50% of total cover:	28	20% of total cover:	11

Plot Size (radius, or length x width) 1/10th acre % Bare Ground 0

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	75.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	10	x 2 =	20
FAC species	65	x 3 =	195
FACU species	55	x 4 =	220
UPL species	0	x 5 =	0
Column Totals:	130 (A)		435 (B)

Prevalence Index = B/A = 3.35

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

SOIL

Sampling Point: 6

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-3							Peat	Fibric
3-12	7.5YR 2.5/3	60	2.5Y 4/3	40	D	M	Loamy/Clayey	
12-24	10YR 3/3	100					Loamy/Clayey	10% roots to 24"

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

Hydric Soil Indicators:

___ Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Depleted Below Dark Surface (A11)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: AEA Bradley-Dixon Borough/City: Homer Sampling Date: 7/30/2024

Applicant/Owner: AEA Sampling Point: 7

Investigator(s): JRG, EGA Landform (hillside, terrace, hummocks, etc.): swale

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

Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains) Lat: 59.746484 Long: -150.808549 Datum: WGS84

Soil Map Unit Name: N/A NWI classification: Upland

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

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

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

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

Hydrophytic Vegetation Present?	Yes X	No ___
Hydric Soil Present?	Yes X	No ___
Wetland Hydrology Present?	Yes X	No ___

Is the Sampled Area within a Wetland? **Yes** X **No** ___

Remarks:
Dry season and APT shows normal conditions

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1. *Salix pulchra*	5	Yes	FACW
2.			
3.			
4.			
5.			
6.			
	5	=Total Cover	
50% of total cover:	3	20% of total cover:	1
Herb Stratum			
1. *Geum macrophyllum*	10	No	FAC
2. *Carex aquatilis*	20	No	OBL
3. *Eriophorum vaginatum*	35	Yes	FACW
4. *Trichophorum caespitosum*	15	No	OBL
5. *Sanguisorba canadensis*	25	Yes	FACW
6. *Swertia perennis*	5	No	FACW
7.			
8.			
9.			
10.			
	110	=Total Cover	
50% of total cover:	55	20% of total cover:	22

Plot Size (radius, or length x width) 1/10th acre % Bare Ground 0

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

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	x 1 =	35
FACW species	70	x 2 =	140
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	115 (A)		205 (B)

Prevalence Index = B/A = 1.78

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

SOIL

Sampling Point: 7

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6							Peat	Fibric
6-13	10YR 4/2	100					Mucky Peat	Hemic
13-18	10YR 4/2	100					Muck	Sapric
18-24	10YR 4/4	100					Mucky Sand	

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

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

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

[4]Give details of color change in Remarks.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

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

Remarks:
Thick organic layer

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?		X	
Water Table Present?	X		23
Saturation Present? (includes capillary fringe)	X		4

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

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

Remarks:
Poorly drained

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Alaska Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***OMB Control #: 0710-0024, Exp: 11/30/2024*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: AEA Bradley-Dixon Borough/City: Homer Sampling Date: 7/30/24

Applicant/Owner: AEA Sampling Point: 8

Investigator(s): JRG, EGA Landform (hillside, terrace, hummocks, etc.): swale

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

Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains) Lat: 59.747316 Long: -150.828547 Datum: WGS84

Soil Map Unit Name: N/A NWI classification: Upland

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

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

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

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

Hydrophytic Vegetation Present?	Yes X	No ___
Hydric Soil Present?	Yes X	No ___
Wetland Hydrology Present?	Yes X	No ___

Is the Sampled Area within a Wetland? **Yes** X **No** ___

Remarks:
Dry season and APT shows normal conditions

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1. *Vaccinium uliginosum*	5	No	FAC
2. *Empetrum nigrum*	20	Yes	FAC
3. *Vaccinium vitis-idaea*	15	Yes	FAC
4. *Rubus pedatus*	2	No	FAC
5. *Alnus incana*	5	No	FAC
6. *Sorbus scopulina*	5	No	FACU
	52	=Total Cover	
50% of total cover:	26	20% of total cover:	11
Herb Stratum			
1. *Eriophorum vaginatum*	30	Yes	FACW
2. *Eurybia sibirica*	20	No	FAC
3. *Carex aquatilis*	40	Yes	OBL
4. *Geum macrophyllum*	20	No	FAC
5. *Artemisia biennis*	5	No	FAC
6. *Veratrum viride*	5	No	FAC
7. *Calamagrostis canadensis*	30	Yes	FAC
8. *Trientalis europaea*	5	No	FACU
9.			
10.			
	155	=Total Cover	
50% of total cover:	78	20% of total cover:	31

Plot Size (radius, or length x width) 1/10th acre % Bare Ground 0

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	40	x 1 =	40
FACW species	30	x 2 =	60
FAC species	127	x 3 =	381
FACU species	10	x 4 =	40
UPL species	0	x 5 =	0
Column Totals:	207 (A)		521 (B)

Prevalence Index = B/A = 2.52

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

SOIL

Sampling Point: 8

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

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-8							Peat	Fibric
8-9	10YR 4/2	100					Mucky Loam/Clay	
9-10	7.5YR 3/4	100					Loamy/Clayey	
10-24	10YR 3/4	100					Loamy/Clayey	

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

Hydric Soil Indicators:

___ Histosol or Histel (A1)
X Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Depleted Below Dark Surface (A11)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if observed):
Type: ___
Depth (inches): ___

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

Remarks:
Saturated soils at 5", AA is negative

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: AEA Bradley-Dixon | Borough/City: Homer | Sampling Date: 7/0/2024
Applicant/Owner: AEA | Sampling Point: 9
Investigator(s): JRG, EGA | Landform (hillside, terrace, hummocks, etc.): hilltop
Local relief (concave, convex, none): concave | Slope (%): 0-1
Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains) | Lat: 59.723087 | Long: -150.69424 | Datum: WGS84
Soil Map Unit Name: N/A | NWI classification: Upland

Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation N , Soil N , or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation N , Soil N , or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ___
Hydric Soil Present?	Yes ___	No X
Wetland Hydrology Present?	Yes ___	No X

Is the Sampled Area within a Wetland? **Yes** ___ **No** X

Remarks:
Dry season and APT shows normal conditions

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1. *Spiraea stevenii*	20	Yes	FACU
2. *Alnus viridis*	45	Yes	FAC
3.			
4.			
5.			
6.			
	65	=Total Cover	
50% of total cover:	33	20% of total cover:	13
Herb Stratum			
1. *Geum macrophyllum*	10	No	FAC
2. *Calamagrostis canadensis*	50	Yes	FAC
3. *Angelica lucida*	10	No	FACU
4. *Artemisia biennis*	3	No	FAC
5. *Trientalis europaea*	5	No	FACU
6.			
7.			
8.			
9.			
10.			
	78	=Total Cover	
50% of total cover:	39	20% of total cover:	16

Plot Size (radius, or length x width) 1/10th acre | % Bare Ground 10
% Cover of Wetland Bryophytes ___ (Where applicable) | Total Cover of Bryophytes ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	66.7%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	108	x 3 =	324
FACU species	35	x 4 =	140
UPL species	0	x 5 =	0
Column Totals:	143 (A)		464 (B)

Prevalence Index = B/A = 3.24

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

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

SOIL

Sampling Point: 9

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-5							Peat	Fibric
5-16	10YR 4/6	100					Sandy	
16-24	10YR 4/1	100					Sandy	

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

Hydric Soil Indicators:

___ Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Depleted Below Dark Surface (A11)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)

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

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

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

Remarks:
Sandy, bright soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Remarks:
Well drained

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: AEA Bradley-Dixon   Borough/City: Homer   Sampling Date: 7/31/2024
Applicant/Owner: AEA   Sampling Point: 10
Investigator(s): JRG, EGA   Landform (hillside, terrace, hummocks, etc.): Floodplain
Local relief (concave, convex, none): none   Slope (%): 0-1
Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains)   Lat: 59.724104   Long: -150.694433   Datum: WGS84
Soil Map Unit Name: N/A   NWI classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation N , Soil N , or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation ___ , Soil N , or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ___
Hydric Soil Present?	Yes ___	No X
Wetland Hydrology Present?	Yes X	No ___

Is the Sampled Area within a Wetland? **Yes** ___ **No** X

Remarks:
Dry season and APT shows normal conditions. Located in stream floodplain

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1. *Salix pulchra*	15	Yes	FACW
2. *Alnus viridis*	12	Yes	FAC
3. *Salix alaxensis*	5	No	FAC
4. *Salix glauca*	10	Yes	FAC
5.			
6.			
	42	=Total Cover	
50% of total cover:	21	20% of total cover:	9
Herb Stratum			
1. *Deschampsia caespitosa*	30	Yes	FAC
2. *Equisetum arvense*	45	Yes	FAC
3. *Equisetum hyemale*	20	Yes	FACW
4. *Parnassia palustris*	3	No	FACW
5.			
6.			
7.			
8.			
9.			
10.			
	98	=Total Cover	
50% of total cover:	49	20% of total cover:	20

Plot Size (radius, or length x width) 1/10th acre   % Bare Ground ___
% Cover of Wetland Bryophytes ___ (Where applicable)   Total Cover of Bryophytes ___

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 6 (A)
Total Number of Dominant Species Across All Strata: 6 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	38	x 2 =	76
FAC species	102	x 3 =	306
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	140 (A)		382 (B)

Prevalence Index = B/A = 2.73

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

SOIL

Sampling Point: 10

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-1							Peat	Fibric
1-8	10YR 3/1	100					Sandy	Coarse
8-18	7.5YR 3/1	100					Mucky Loam/Clay	Living roots
18-24	2.5Y 3/1	70					Mucky Loam/Clay	30% buried organics

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

Hydric Soil Indicators:

___ Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Depleted Below Dark Surface (A11)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

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

Remarks:
Sandy soils

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes X	No ___	Depth (inches): 23
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 16

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

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: AEA Bradley-Dixon Borough/City: Homer Sampling Date: 7/31/2024

Applicant/Owner: AEA Sampling Point: 11

Investigator(s): JRG, EGA Landform (hillside, terrace, hummocks, etc.): terrace

Local relief (concave, convex, none): none Slope (%): 0

Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains) Lat: 59.722654 Long: -150.689276 Datum: WGS84

Soil Map Unit Name: N/A NWI classification: R3USC

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

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

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

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

Hydrophytic Vegetation Present? Yes X No ___
Hydric Soil Present? Yes X No ___
Wetland Hydrology Present? Yes X No ___

Is the Sampled Area within a Wetland? **Yes** X **No** ___

Remarks:
Dry season and APT shows normal conditions. Sample point taken is vegetated braided channel below OHW. Stream

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Salix alaxensis*	40	Yes	FAC
2.			
3.			
4.			
	40	=Total Cover	
50% of total cover: 20		20% of total cover: 8	
Sapling/Shrub Stratum			
1. *Salix alaxensis*	10	Yes	FAC
2. *Alnus viridis*	2	No	FAC
3. *Rubus pedatus*	2	No	FAC
4.			
5.			
6.			
	14	=Total Cover	
50% of total cover: 7		20% of total cover: 3	
Herb Stratum			
1. *Calamagrostis canadensis*	10	Yes	FAC
2. *Epilobium palustre*	5	Yes	OBL
3. *Artemisia tilesii*	2	No	FACU
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	17	=Total Cover	
50% of total cover: 9		20% of total cover: 4	

Plot Size (radius, or length x width) 1/10th acre % Bare Ground 0
% Cover of Wetland Bryophytes ___ Total Cover of Bryophytes ___
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	0	x 2 =	0
FAC species	64	x 3 =	192
FACU species	2	x 4 =	8
UPL species	0	x 5 =	0
Column Totals:	71 (A)		205 (B)

Prevalence Index = B/A = 2.89

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

SOIL

Sampling Point: 11

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

Depth	Matrix		Redox Features				Texture	Remarks
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]		
0-10	10YR 2/1	100					Sandy	
10-14	10YR 2/1	40					Sandy	coarse, 60% gravel
14-24	10YR 2/1	100					Sandy	

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

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)
- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)

Indicators for Problematic Hydric Soils[3]:

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

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

[4]Give details of color change in Remarks.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

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

Remarks:
Sand is dark in color. Problematic soils with primary hydrology of drift deposits within a concave landscape within a stream floodplain and dark mineral sand that accumulates moisture.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Remarks:
Evidence of flooding with stripped alders within drainage patterns.

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Alaska Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp: 11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: AEA Bradley-Dixon Borough/City: Homer Sampling Date: 7/31/2024

Applicant/Owner: AEA Sampling Point: 12

Investigator(s): JRG, EGA Landform (hillside, terrace, hummocks, etc.): hillside

Local relief (concave, convex, none): convex Slope (%): 2-5

Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains) Lat: 59.721157 Long: -150.685941 Datum: WGS84

Soil Map Unit Name: N/A NWI classification: Upland

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

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

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

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

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

Remarks:
Dry season and APT shows normal conditions

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1. *Spiraea stevenii*	30	Yes	FACU
2. *Alnus incana*	15	Yes	FAC
3. *Rubus pedatus*	10	No	FAC
4.			
5.			
6.			
	55	=Total Cover	
50% of total cover:	28	20% of total cover:	11
Herb Stratum			
1. *Trientalis europaea*	10	No	FACU
2. *Calamagrostis canadensis*	60	Yes	FAC
3. *Gymnocarpium dryopteris*	15	No	FACU
4. *Veratrum viride*	5	No	FAC
5. *Chamaenerion angustifolium*	40	Yes	FACU
6.			
7.			
8.			
9.			
10.			
	130	=Total Cover	
50% of total cover:	65	20% of total cover:	26

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

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	90	x 3 =	270
FACU species	95	x 4 =	380
UPL species	0	x 5 =	0
Column Totals:	185 (A)		650 (B)

Prevalence Index = B/A = 3.51

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks:

SOIL

Sampling Point: 12

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5							Peat	Fibric
5-10	10YR 4/4	100					Loamy/Clayey	10% gravel
10-16	7.5YR 4/4	100					Loamy/Clayey	
16-24	10YR 4/3	60	7.5YR 5/4	40	RM	M	Loamy/Clayey	30% large cobbles

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

Hydric Soil Indicators:

___ Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Depleted Below Dark Surface (A11)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

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

Remarks:
Bright upland soils, 16-24" layer has a second matrix of 7.5YR 5/4

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Remarks:
Well drained

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Alaska Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp: 11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: AEA Bradley-Dixon Borough/City: Homer Sampling Date: 7/31/2024

Applicant/Owner: AEA Sampling Point: 13

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

Local relief (concave, convex, none): concave Slope (%): 5

Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains) Lat: 59.728769 Long: -150.689411 Datum: WGS84

Soil Map Unit Name: N/A NWI classification: R3USC

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

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

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

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

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

Remarks:
Dry season and APT shows nornal conditions

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1. *Rubus pedatus*	2	No	FAC
2. *Vaccinium uliginosum*	20	Yes	FAC
3. *Sambucus racemosa*	5	No	FACU
4. *Alnus incana*	15	Yes	FAC
5.			
6.			
	42	=Total Cover	
50% of total cover:	21	20% of total cover:	9
Herb Stratum			
1. *Calamagrostis canadensis*	10	No	FAC
2. *Geranium erianthum*	5	No	FACU
3. *Deschampsia caespitosa*	15	No	FAC
4. *Campanula rotundifolia*	10	No	UPL
5. *Maianthemum dilatatum*	70	Yes	FAC
6. *Chamaenerion angustifolium*	15	No	FACU
7.			
8.			
9.			
10.			
	125	=Total Cover	
50% of total cover:	63	20% of total cover:	25

Plot Size (radius, or length x width) 1/10th acre % Bare Ground 0

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	3	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	132	x 3 =	396
FACU species	25	x 4 =	100
UPL species	10	x 5 =	50
Column Totals:	167 (A)		546 (B)

Prevalence Index = B/A = 3.27

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

SOIL

Sampling Point: 13

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5							Peat	Fibric
5-11	10YR 3/4	100					Loamy/Clayey	
11-24	10YR 3/2	100					Loamy/Clayey	10% gravels

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

Hydric Soil Indicators:

___ Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Depleted Below Dark Surface (A11)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Remarks:

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Alaska Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp: 11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: AEA Bradley-Dixon Borough/City: Homer Sampling Date: 7/31/2024

Applicant/Owner: AEA Sampling Point: 14

Investigator(s): JRG, EGA Landform (hillside, terrace, hummocks, etc.): mound

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

Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains) Lat: 59.701066 Long: -150.705689 Datum: WGS84

Soil Map Unit Name: N/A NWI classification: Upland

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

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

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

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

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

Remarks:
Streambank between two wet areas. Dry season and APT shows normal conditions

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1. *Salix pulchra*	45	Yes	FACW
2. *Salix sitchensis*	35	Yes	FAC
3.			
4.			
5.			
6.			
	80	=Total Cover	
50% of total cover:	40	20% of total cover:	16
Herb Stratum			
1. *Lupinus arcticus*	10	Yes	FACU
2. *Aconitum delphiniifolium*	15	Yes	FAC
3. *Castilleja unalaschcensis*	5	No	FAC
4. *Angelica lucida*	3	No	FACU
5. *Chamaenerion angustifolium*	2	No	FACU
6. *Achillea millefolium*	5	No	FACU
7. *Poa pratensis*	10	Yes	FACU
8. *Trientalis europaea*	3	No	FACU
9. *Artemisia tilesii*	2	No	FACU
10. *Pyrola asarifolia*	1	No	FACU
	56	=Total Cover	
50% of total cover:	28	20% of total cover:	12

Plot Size (radius, or length x width) 1/10th acre % Bare Ground 0

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	3	(A)
Total Number of Dominant Species Across All Strata:	5	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	60.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	45	x 2 =	90
FAC species	55	x 3 =	165
FACU species	36	x 4 =	144
UPL species	0	x 5 =	0
Column Totals:	136 (A)		399 (B)

Prevalence Index = B/A = 2.93

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

SOIL

Sampling Point: 14

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4							Peat	Fibric
4-12	5Y 4/1	100					Sandy	Coarse, 70% cobbles
12-20	2.5Y 4/1	90	10YR 4/4	10	C	PL	Sandy	Prominent redox concentrations
								coarse

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

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

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

[4]Give details of color change in Remarks.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

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

Remarks:
Rock refusal at 20"

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Remarks:
Well drained

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Alaska Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	***OMB Control #: 0710-0024, Exp: 11/30/2024*** ***Requirement Control Symbol EXEMPT:*** ***(Authority: AR 335-15, paragraph 5-2a)***

Project/Site: AEA Bradley-Dixon Borough/City: Homer Sampling Date: 7/31/2024

Applicant/Owner: AEA Sampling Point: 15

Investigator(s): JRG, EGA Landform (hillside, terrace, hummocks, etc.): terrace

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

Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains) Lat: 59.701232 Long: -150.704234 Datum: WGS84

Soil Map Unit Name: N/A NWI classification: Upland

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

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

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

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

Hydrophytic Vegetation Present?	Yes X	No ___
Hydric Soil Present?	Yes X	No ___
Wetland Hydrology Present?	Yes X	No ___

Is the Sampled Area within a Wetland? **Yes** X **No** ___

Remarks:
Dry season and APT shows normal conditions

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1. *Vaccinium uliginosum*	40	Yes	FAC
2. *Empetrum nigrum*	20	No	FAC
3. *Salix sitchensis*	10	No	FAC
4. *Rubus pedatus*	10	No	FAC
5. *Salix pulchra*	25	Yes	FACW
6. *Salix reticulata*	10	No	FAC
	115	=Total Cover	
50% of total cover:	58	20% of total cover:	23
Herb Stratum			
1. *Sedum lanceolatum*	10	Yes	UPL
2. *Platanthera aquilonis*	5	No	FACW
3. *Cornus suecica*	2	No	FAC
4. *Polemonium acutiflorum*	5	No	FAC
5. *Eriophorum angustifolium*	2	No	OBL
6. *Sanguisorba canadensis*	10	Yes	FACW
7. *Carex macrochaeta*	10	Yes	FACW
8. *Lepidium perfoliatum*	2	No	UPL
9.			
10.			
	46	=Total Cover	
50% of total cover:	23	20% of total cover:	10

Plot Size (radius, or length x width) 1/10th acre % Bare Ground 0

% Cover of Wetland Bryophytes 5 Total Cover of Bryophytes ___
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	2	x 1 =	2
FACW species	50	x 2 =	100
FAC species	97	x 3 =	291
FACU species	0	x 4 =	0
UPL species	12	x 5 =	60
Column Totals:	161 (A)		453 (B)

Prevalence Index = B/A = 2.81

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: 15

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8							Peat	Fibric
8-20							Peat	gravel/cobbles, rock refusal

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

Hydric Soil Indicators:

- X Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:

	Yes	No	Depth (inches)
Surface Water Present?		X	
Water Table Present?	X		8
Saturation Present? (includes capillary fringe)	X		3

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

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: AEA Bradley-Dixon Borough/City: Homer Sampling Date: 8/1/2024
Applicant/Owner: AEA Sampling Point: 16
Investigator(s): JRG, EGA Landform (hillside, terrace, hummocks, etc.): swale
Local relief (concave, convex, none): concave Slope (%): 0-1
Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains) Lat: 59.705305 Long: -150.722395 Datum: WGS84
Soil Map Unit Name: N/A NWI classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation N , Soil N , or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation N , Soil N , or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

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

	Yes	No
Hydrophytic Vegetation Present?	X	
Hydric Soil Present?		X
Wetland Hydrology Present?	X	

Is the Sampled Area within a Wetland? **Yes** ___ **No** X

Remarks:
Dry season and APT shows normal conditions

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1. *Empetrum nigrum*	25	Yes	FAC
2. *Vaccinium uliginosum*	15	Yes	FAC
3.			
4.			
5.			
6.			
	40	=Total Cover	
50% of total cover:	20	20% of total cover:	8
Herb Stratum			
1. *Trichophorum caespitosum*	25	Yes	OBL
2. *Eriophorum angustifolium*	45	Yes	OBL
3. *Geum calthifolium*	20	No	FACW
4. *Carex microchaeta*	10	No	FAC
5. *Eurybia sibirica*	12	No	FAC
6. *Platanthera aquilonis*	3	No	FACW
7. *Sanguisorba canadensis*	2	No	FACW
8. *Swertia perennis*	3	No	FACW
9. *Equisetum pratense*	5	No	FACW
10. *Iris setosa*	3	No	FAC
	130	=Total Cover	
50% of total cover:	65	20% of total cover:	26

Plot Size (radius, or length x width) 1/10th acre % Bare Ground 0
% Cover of Wetland Bryophytes ___ Total Cover of Bryophytes ___
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	4	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	70	x 1 =	70
FACW species	33	x 2 =	66
FAC species	65	x 3 =	195
FACU species	0	x 4 =	0
UPL species	2	x 5 =	10
Column Totals:	170 (A)		341 (B)

Prevalence Index = B/A = 2.01

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

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

VEGETATION Continued – Use scientific names of plants. Sampling Point: 16

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
		=Total Cover	
50% of total cover:		20% of total cover:	

Sapling/Shrub Stratum	Absolute % Cover	Dominant Species?	Indicator Status
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
	40	=Total Cover	
50% of total cover: 20		20% of total cover:	8

Herb Stratum	Absolute % Cover	Dominant Species?	Indicator Status
11. *Sedum lanceolatum*	2	No	UPL
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
	130	=Total Cover	
50% of total cover: 65		20% of total cover:	26

Definitions of Vegetation Strata:

Tree – Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/Shrub – Woody plants less than 3 in. DBH, regardless of height.

Herb – All herbaceous (non-woody) plants, regardless of size.

Remarks:

SOIL

Sampling Point: 16

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-4							Peat	Fibric
4-15	10YR 3/2	80	7.5YR 4/4	20	C	M	Loamy/Clayey	Distinct redox concentrations
15-24	2.5Y 4/1	100					Sandy	10% gravels

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

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

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

[4]Give details of color change in Remarks.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

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

Remarks:

AA is negative

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: AEA Bradley-Dixon Borough/City: Homer Sampling Date: 8/1/2024
Applicant/Owner: AEA Sampling Point: 17
Investigator(s): JRG, EGA Landform (hillside, terrace, hummocks, etc.): terrace
Local relief (concave, convex, none): none Slope (%): 0
Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains) Lat: 59.706192 Long: -150.721515 Datum: WGS84
Soil Map Unit Name: N/A NWI classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation N , Soil N , or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation N , Soil N , or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes X	No ___
Hydric Soil Present?	Yes X	No ___
Wetland Hydrology Present?	Yes X	No ___

Is the Sampled Area within a Wetland? **Yes** X **No** ___

Remarks:
Dry season and APT shows normal conditions

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1. *Vaccinium uliginosum*	10	Yes	FAC
2. *Alnus incana*	5	Yes	FAC
3. *Salix pulchra*	10	Yes	FACW
4.			
5.			
6.			
	25	=Total Cover	
50% of total cover:	13	20% of total cover:	5
Herb Stratum			
1. *Eriophorum angustifolium*	60	Yes	OBL
2. *Platanthera aquilonis*	2	No	FACW
3. *Eurybia sibirica*	2	No	FAC
4. *Sanguisorba canadensis*	15	No	FACW
5. *Geum calthifolium*	10	No	FACW
6. *Equisetum pratense*	2	No	FACW
7. *Carex microchaeta*	40	Yes	FAC
8. *Swertia perennis*	5	No	FACW
9. *Deschampsia caespitosa*	20	No	FAC
10.			
	156	=Total Cover	
50% of total cover:	78	20% of total cover:	32

Plot Size (radius, or length x width) 1/10th acre % Bare Ground 0
% Cover of Wetland Bryophytes ___ Total Cover of Bryophytes ___
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	5	(A)
Total Number of Dominant Species Across All Strata:	5	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	100.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	60	x 1 =	60
FACW species	44	x 2 =	88
FAC species	77	x 3 =	231
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	181 (A)		379 (B)

Prevalence Index = B/A = 2.09

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

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

SOIL

Sampling Point: 17

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-11							Peat	Fibric
11-17	10YR 2/2	100					Loamy/Clayey	
17-24	5Y 5/1	85	10YR 4/6	15	C	PL	Sandy	Prominent redox concentrations

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

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- X Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- X Other (Explain in Remarks)

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

[4]Give details of color change in Remarks.

Restrictive Layer (if observed):

Type: ______

Depth (inches): ______

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

Remarks:

AA positive in 11 through 24 inches, coarse sand texture

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No X	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 0

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

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

Remarks:

Water starting to seep through walls, up to 6"

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Alaska Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp: 11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: AEA Bradley-Dixon Borough/City: Homer Sampling Date: 8/1/2024

Applicant/Owner: AEA Sampling Point: 18

Investigator(s): JRG, EGA Landform (hillside, terrace, hummocks, etc.): hillside

Local relief (concave, convex, none): concave Slope (%): 1-2

Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains) Lat: 59.703133 Long: -150.716891 Datum: WGS84

Soil Map Unit Name: N/A NWI classification: Upland

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

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

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

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

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

Remarks:
Dry season and APT shows normal conditions

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. *Alnus incana*	10	Yes	FAC
2.			
3.			
4.			
	10	=Total Cover	
50% of total cover: 5		20% of total cover: 2	
Sapling/Shrub Stratum			
1. *Salix pulchra*	40	Yes	FACW
2. *Salix sitchensis*	20	Yes	FAC
3. *Alnus incana*	5	No	FAC
4. *Rubus pedatus*	10	No	FAC
5.			
6.			
	75	=Total Cover	
50% of total cover: 38		20% of total cover: 15	
Herb Stratum			
1. *Calamagrostis canadensis*	25	Yes	FAC
2. *Chamaenerion angustifolium*	15	Yes	FACU
3. *Eurybia sibirica*	2	No	FAC
4. *Castilleja unalaschcensis*	5	No	FAC
5. *Veratrum viride*	10	No	FAC
6. *Sanguisorba canadensis*	5	No	FACW
7. *Pyrola asarifolia*	10	No	FACU
8. *Heracleum maximum*	5	No	FACU
9.			
10.			
	77	=Total Cover	
50% of total cover: 39		20% of total cover: 16	

Plot Size (radius, or length x width) 1/10th acre % Bare Ground 0

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	4	(A)
Total Number of Dominant Species Across All Strata:	5	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	80.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	45	x 2 = 90
FAC species	87	x 3 = 261
FACU species	30	x 4 = 120
UPL species	0	x 5 = 0
Column Totals:	162 (A)	471 (B)

Prevalence Index = B/A = 2.91

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point: 18

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6							Peat	Fibric
6-20	10YR 3/3	100					Loamy/Clayey	10% gravels
20-24								100% gravel

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

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)
- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

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

[4]Give details of color change in Remarks.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Remarks:

U.S. Army Corps of Engineers **WETLAND DETERMINATION DATA SHEET – Alaska Region** See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R	*OMB Control #: 0710-0024, Exp: 11/30/2024* *Requirement Control Symbol EXEMPT:* *(Authority: AR 335-15, paragraph 5-2a)*

Project/Site: AEA Bradley-Dixon Borough/City: Homer Sampling Date: 8/1/2024

Applicant/Owner: AEA Sampling Point: 19

Investigator(s): JRG, EGA Landform (hillside, terrace, hummocks, etc.): valley bottom

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

Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains) Lat: 59.699344 Long: -150.708474 Datum: WGS84

Soil Map Unit Name: N/A NWI classification: Upland

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

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

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

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

Hydrophytic Vegetation Present?	Yes X	No ___
Hydric Soil Present?	Yes ___	No X
Wetland Hydrology Present?	Yes ___	No X

Is the Sampled Area within a Wetland? **Yes** ___ **No** X

Remarks:
Dry season and APT shows normal conditions.

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1. *Salix pulchra*	45	Yes	FACW
2. *Salix sitchensis*	30	Yes	FAC
3. *Rubus arcticus*	2	No	FAC
4.			
5.			
6.			
	77	=Total Cover	
50% of total cover:	39	20% of total cover:	16
Herb Stratum			
1. *Epilobium palustre*	5	No	OBL
2. *Lupinus arcticus*	15	Yes	FACU
3. *Pyrola asarifolia*	20	Yes	FACU
4. *Artemisia biennis*	3	No	FAC
5. *Carex microchaeta*	2	No	FAC
6. *Achillea millefolium*	1	No	FACU
7. *Castilleja unalaschcensis*	3	No	FAC
8. *Eurybia sibirica*	5	No	FAC
9.			
10.			
	54	=Total Cover	
50% of total cover:	27	20% of total cover:	11

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

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

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC:	2	(A)
Total Number of Dominant Species Across All Strata:	4	(B)
Percent of Dominant Species That Are OBL, FACW, or FAC:	50.0%	(A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	5	x 1 =	5
FACW species	45	x 2 =	90
FAC species	45	x 3 =	135
FACU species	36	x 4 =	144
UPL species	0	x 5 =	0
Column Totals:	131 (A)		374 (B)

Prevalence Index = B/A = 2.85

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:

SOIL

Sampling Point: 19

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4							Peat	Fibric
4-16	2.5Y 4/4	100					Sandy	coarse sand, living roots, 60% gravel
16-24	10YR 2/1	100					Sandy	40% gravel

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

Hydric Soil Indicators:

___ Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Depleted Below Dark Surface (A11)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

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

Remarks:
Dark sandy soils below 16 inches

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Remarks:
Well drained

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: AEA Bradley-Dixon Borough/City: Homer Sampling Date: 8/1/2024
Applicant/Owner: AEA Sampling Point: 20
Investigator(s): JRG, EGA Landform (hillside, terrace, hummocks, etc.): terrace
Local relief (concave, convex, none): none Slope (%): 0-1
Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains) Lat: 59.697394 Long: -150.709286 Datum: WGS84
Soil Map Unit Name: N/A NWI classification: Upland
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ___ (If no, explain in Remarks.)
Are Vegetation N , Soil N , or Hydrology N significantly disturbed? Are "Normal Circumstances" present? Yes X No ___
Are Vegetation N , Soil N , or Hydrology N naturally problematic? (If needed, explain any answers in Remarks.)

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

	Yes	No
Hydrophytic Vegetation Present?		X
Hydric Soil Present?		X
Wetland Hydrology Present?		X

Is the Sampled Area within a Wetland? **Yes** ___ **No** X

Remarks:
Dry season and APT shows normal conditions

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1. *Salix sitchensis*	30	Yes	FAC
2. *Salix pulchra*	20	Yes	FACW
3. *Rubus pedatus*	10	No	FAC
4.			
5.			
6.			
	60	=Total Cover	
50% of total cover:	30	20% of total cover:	12
Herb Stratum			
1. *Lupinus arcticus*	30	Yes	FACU
2. *Pyrola asarifolia*	25	Yes	FACU
3. *Eurybia sibirica*	10	No	FAC
4. *Carex microchaeta*	5	No	FAC
5. *Artemisia biennis*	2	No	FAC
6. *Parnassia parviflora*	5	No	OBL
7.			
8.			
9.			
10.			
	77	=Total Cover	
50% of total cover:	39	20% of total cover:	16

Plot Size (radius, or length x width) 1/10th acre % Bare Ground 0
% Cover of Wetland Bryophytes ___ Total Cover of Bryophytes ___
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	5	x 1 = 5
FACW species	20	x 2 = 40
FAC species	57	x 3 = 171
FACU species	55	x 4 = 220
UPL species	0	x 5 = 0
Column Totals:	137 (A)	436 (B)

Prevalence Index = B/A = 3.18

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** ___ **No** X

Remarks:

SOIL

Sampling Point: 20

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

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1							Peat	Fibric
1-3	10YR 2/1	100					Loamy/Clayey	
3-8	10YR 2/1	100					Sandy	
8-16	10YR 2/1	100					Sandy	70% gravel and cobbles
16-24	10YR 2/1	100					Sandy	90% gravels

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

Hydric Soil Indicators:

___ Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Depleted Below Dark Surface (A11)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)

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

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

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

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:
Surface Water Present? Yes ___ No X Depth (inches): ___
Water Table Present? Yes ___ No X Depth (inches): ___
Saturation Present? Yes ___ No X Depth (inches): ___
(includes capillary fringe)

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

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

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: AEA Bradley-Dixon   Borough/City: Homer   Sampling Date: 8/1/2024

Applicant/Owner: AEA   Sampling Point: 21

Investigator(s): JRG, EGA   Landform (hillside, terrace, hummocks, etc.): hillside

Local relief (concave, convex, none): convex   Slope (%): 1-3

Subregion: LRR W1, MLRA 222 (Southern Alaska Coastal Mountains)   Lat: 59.699534   Long: -150.705486   Datum: WGS84

Soil Map Unit Name: N/A   NWI classification: Upland

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

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

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

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

Hydrophytic Vegetation Present?	Yes X	No ___
Hydric Soil Present?	Yes ___	No X
Wetland Hydrology Present?	Yes ___	No X

Is the Sampled Area within a Wetland? **Yes** ___ **No** X

Remarks:
Dry season and APT shows normal conditions

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1. -			
2.			
3.			
4.			
		=Total Cover	
50% of total cover:		20% of total cover:	
Sapling/Shrub Stratum			
1. *Salix pulchra*	35	Yes	FACW
2. *Rubus pedatus*	5	No	FAC
3. *Salix sitchensis*	25	Yes	FAC
4. *Picea glauca*	3	No	FACU
5.			
6.			
	68	=Total Cover	
50% of total cover:	34	20% of total cover:	14
Herb Stratum			
1. *Eurybia sibirica*	25	Yes	FAC
2. *Achillea millefolium*	15	Yes	FACU
3. *Angelica lucida*	10	No	FACU
4. *Lupinus arcticus*	20	Yes	FACU
5. *Pyrola asarifolia*	5	No	FACU
6. *Sanguisorba canadensis*	10	No	FACW
7. *Delphinium glaucum*	2	No	FACW
8. *Castilleja unalaschcensis*	3	No	FAC
9.			
10.			
	90	=Total Cover	
50% of total cover:	45	20% of total cover:	18

Plot Size (radius, or length x width) 1/10th acre   % Bare Ground 0

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

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 60.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	47	x 2 =	94
FAC species	58	x 3 =	174
FACU species	53	x 4 =	212
UPL species	0	x 5 =	0
Column Totals:	158 (A)		480 (B)

Prevalence Index = B/A = 3.04

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? **Yes** X **No** ___

Remarks:
lycopodium/clubmoss

SOIL

Sampling Point: 21

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-2							Peat	Fibric
2-14	10YR 3/2	100					Sandy	coarse
14-24	2.5Y 3/1	100					Loamy/Clayey	30% cobbles

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

Hydric Soil Indicators:

___ Histosol or Histel (A1)
___ Histic Epipedon (A2)
___ Black Histic (A3)
___ Hydrogen Sulfide (A4)
___ Thick Dark Surface (A12)
___ Alaska Gleyed (A13)
___ Alaska Redox (A14)
___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

___ Depleted Below Dark Surface (A11)
___ Depleted Matrix (F3)
___ Redox Dark Surface (F6)
___ Depleted Dark Surface (F7)
___ Redox Depressions (F8)
___ Red Parent Material (F21)
___ Very Shallow Dark Surface (F22)
___ Alaska Color Change (TA4)[4]
___ Alaska Alpine Swales (TA5)
___ Alaska Redox With 2.5Y Hue
___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.
[4]Give details of color change in Remarks.

Restrictive Layer (if observed):
Type: ______
Depth (inches): ______

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

Remarks:
Thin organics

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

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

Secondary Indicators (2 or more required)

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

Field Observations:

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

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

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

Remarks:
well drained

Photo Type: SP1	Location Description: 59.745632, -150.834811	Landscape: FACING NORTH

Landscape: FACING EAST

SOIL PIT

Photo Type: SP2	Location Description: 59.745197, -150.839373	Landscape: FACING SOUTH

Landscape: FACING WEST

SOIL PIT

Photo Type: SP3	Location Description: 59.744933, 150.843848	Landscape: FACING EAST

Landscape: FACING SOUTH

SOIL PIT

Photo Type: SP4	Location Description: 59.746953, -150.831922	Landscape: FACING SOUTH

Landscape: FACING WEST

SOIL PIT

Photo Type: SP5	Location Description: 59.746953, -150.831922	Landscape: FACING NORTH

Landscape: FACING EAST

SOIL PIT

Photo Type: SP6	Location Description: 59.745758, -150.833393	Landscape: FACING EAST

Landscape: FACING SOUTH

SOIL PIT

Photo Type: SP7	Location Description: 59.746483, -150.828527	Landscape: FACING NORTH

Landscape: FACING WEST

SOIL PIT

Photo Type: SP8	Location Description: 59.747314, -150.828525	Landscape: FACING NORTH

Landscape: FACING SOUTH

SOIL PIT

Photo Type: SP9	Location Description: 59.724102, -150.694182	Landscape: FACING NORTH

Landscape: FACING EAST

SOIL PIT

Photo Type: SP10	Location Description: 59.724102, -150.694411	Landscape: FACING NORTH

Landscape: FACING EAST

SOIL PIT

Photo Type: SP11	Location Description: 59.722653, -150.689253	Landscape: FACING NORTH

Landscape: FACING EAST

SOIL PIT

Photo Type: SP12	Location Description: 59.721155, -150.685919	Landscape: FACING EAST

Landscape: FACING WEST

SOIL PIT

1133.63471.02 Wetland Delineation

Dixon Diversion Project
July 29-August 2, 2024

Site Photos
SP1-21
PP1-PP85

Photo Type: SP13	Location Description: 59.728768, -150.689389	Landscape: FACING SOUTH

Landscape: FACING WEST

SOIL PIT

Photo Type: SP14	Location Description: 59.701064, -150.705667	Landscape: FACING EAST

Landscape: FACING SOUTH

SOIL PIT

1133.63471.02 Wetland Delineation

Dixon Diversion Project

July 29-August 2, 2024

Site Photos

SP1-21
PP1-PP85

Photo Type: SP15	Location Description: 59.701231, -150.704212	Landscape: FACING NORTH

Landscape: FACING WEST

SOIL PIT

Photo Type: SP16	Location Description: 59.705304, -150.722373	Landscape: FACING NORTH

Landscape: FACING EAST

SOIL PIT

Photo Type: SP17	Location Description: 59.706191, -150.721493	Landscape: FACING EAST

Landscape: FACING SOUTH

SOIL PIT

Photo Type: SP18	Location Description: 59.703131, -150.716869	Landscape: FACING EAST

Landscape: FACING SOUTH

SOIL PIT

Photo Type: SP19	Location Description: 59.699343, -150.708452	Landscape: FACING NORTH

Landscape: FACING EAST

SOIL PIT

Photo Type: SP20	Location Description: 59.697392, -150.706264	Landscape: FACING EAST

Landscape: FACING SOUTH

SOIL PIT

Photo Type: SP21	Location Description: 59.699533, -150.705464	Landscape: FACING EAST

Landscape: FACING SOUTH

SOIL PIT

Photo Type: PP1	Location Description: 59.744776, -150.845558	Landscape: FACING NORTH

Landscape: FACING EAST

SOIL PLUG

Photo Type: PP2	Location Description: 59.744854, -150.844835	Stream : FACING UPSTREAM

Stream : FACING DOWNSTREAM

Stream : FACING ACROSS

Photo Type: PP3	Location Description: 59.745315, -150.838464	Landscape: FACING NORTH

Landscape: FACING WEST

Observed ground cover

Photo Type: PP4	Location Description: 59.745238, -150.837983	Stream: FACING UPSTREAM

Stream: FACING DOWNSTREAM

Steam: FACING ACROSS

Photo Type: PP5	Location Description: 59.745205, -150.837777	Stream: FACING UPSTREAM

Stream: FACING DOWNSTREAM

Stream: FACING ACROSS

Photo Type: PP6	Location Description: 59.745233, -150.837153	Stream: FACING UPSTREAM

Stream: FACING DOWNSTREAM

Stream: FACING ACROSS

Photo Type: PP7	Location Description: 59.745486, -150.836847	Landscape: FACING NORTH

Landscape: FACING WEST

Observed ground cover

Photo Type: PP8	Location Description: 59.745393, -150.836511	Stream: FACING UPSTREAM

Stream: FACING DOWNSTREAM

Stream: FACING ACROSS

Photo Type: PP9	Location Description: 59.745446, -150.835953	Stream: FACING UPSTREAM

Stream: FACING DOWNSTREAM

Stream: FACING ACOSS

Photo Type: PP10	Location Description: 59.745523, -150.835134	Stream: FACING UPSTREAM

Stream: FACING DOWNSTREAM

Stream: FACING ACROSS

Photo Type: PP11	Location Description: 59.745227, -150.837312	Landscape: FACING NORTH

Landscape: FACING WEST

Oberved ground cover

Photo Type: PP12	Location Description: 59.744893, -150.842832	Landscape: FACING EAST

Landscape: FACING SOUTH

Observed ground cover

Photo Type: PP13	Location Description: 59.744798, -150.844742	Landscape: FACING NORTH

Landscape: FACING EAST

SOILS: Soil plug

Photo Type: PP14	Location Description: 59.744643, -150.846074	Landscape: FACING SOUTH

Landscape: FACING WEST

Observed ground cover

Photo Type: PP15	Location Description: 59.744963, -150.846308	Landscape: FACING EAST

Landscape: FACING SOUTH

Observed ground cover

Photo Type: PP16	Location Description: 59.744747, -150.847005	Landscape: FACING EAST

Landscape: FACING SOUTH

Observed ground cover

Photo Type: PP17	Location Description: 59.744690, -150.847410	Stream: FACING UPSTREAM

Stream: FACING DOWNSTREAM

Stream: FACING ACROSS

Photo Type: PP18	Location Description: 59.754904, -150.855926	Landscape: FACING NORTH

Landscape: FACING EAST

Landscape: FACING SOUTH

Photo Type: PP19	Location Description: 59.755167, -150.854632	Landscape: FACING NORTH

Landscape: FACING SOUTH

Landscape: FACING WEST

Photo Type: PP20	Location Description: 59.755241, -150.852756	Landscape: FACING NORTH

Landscape: FACING EAST

Landscape: FACING WEST

Photo Type: PP21	Location Description: 59.755347, -150.851105	Landscape: FACING NORTH

Landscape: FACING EAST

Observed ground cover

Photo Type: PP22	Location Description: 59.694091, -150.916818	Landscape: FACING EAST

Landscape: FACING SOUTH

Observed ground cover

Photo Type: PP23	Location Description: 59.694164, -150.917363	Landscape: FACING NORTH

Landscape: FACING SOUTH

HYDROLOGY

Photo Type: PP24	Location Description: 59.694088, -150.917684	Landscape: FACING NORTH

Landscape: FACING EAST

Landscape: FACING SOUTH

Photo Type: PP25	Location Description: 59.694587, -150.918530	Landscape: FACING NORTH

Landscape: FACING EAST

Landscape: FACING SOUTH

Photo Type: PP26	Location Description: 59.747059, -150.832118	Landscape: FACING SOUTH

Landscape: FACING WEST

Observed ground cover

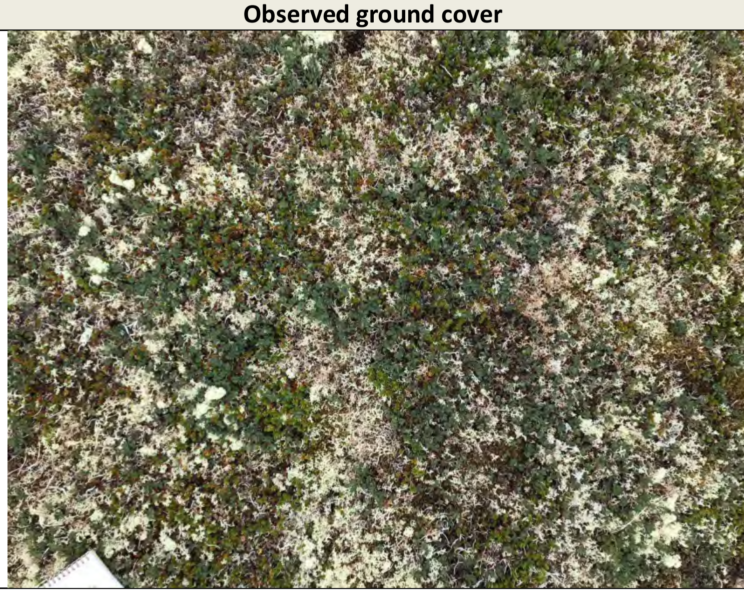


Photo Type: PP27	Location Description: 59.746837, -150.831074	Landscape: FACING EAST

Landscape: FACING SOUTH

Observed ground cover

Photo Type: PP28	Location Description: 59.746477, -150.832211	Stream: FACING UPSTREAM

Stream: FACING DOWNSTREAM

Stream: FACING ACROSS

Photo Type: PP29	Location Description: 59.746188, -150.832351	Landscape: FACING EAST

Landscape: FACING SOUTH

Observed ground cover

Photo Type: PP30	Location Description: 59.746002, -150.833130	Landscape: FACING NORTH

Landscape: FACING WEST

Observed ground cover

Photo Type: PP31	Location Description: 59.745766, -150.834063	Landscape: FACING NORTH

Landscape: FACING WEST

Observed ground cover, across stream

Photo Type: PP32	Location Description: 59.746502, -150.831607	Landscape: FACING EAST

Landscape: FACING SOUTH

Observed ground cover

Photo Type: PP33	Location Description: 59.746598, -150.830906	Landscape: FACING NORTH

Landscape: FACING EAST

Observed ground cover

Photo Type: PP34	Location Description: 59.746424, -150.828397	Landscape: FACING NORTH

Landscape: FACING WEST

SOILS: Soil plug

Photo Type: PP35	Location Description: 59.747172, -150.829173	Landscape: FACING NORTH

Landscape: FACING SOUTH

Observed ground cover

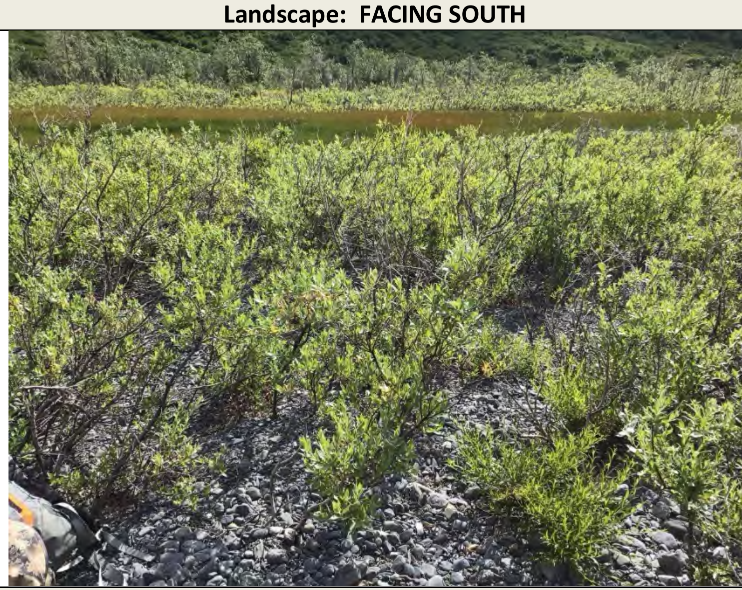
Photo Type: PP36	Location Description: 59.723148, -150.692951	Landscape: FACING EAST

Landscape: FACING SOUTH

Observed ground cover

Photo Type: PP37	Location Description: 59.732202, -150.629031	Landscape: FACING EAST

Landscape: FACING SOUTH



Observed ground cover

Photo Type: PP38	Location Description: 59.724009, -150.695115	Landscape: FACING NORTH

Landscape: FACING EAST

SOILS: Soil plug

Photo Type: PP39	Location Description: 59.724127, -150.695806	Landscape: FACING SOUTH

Landscape: FACING WEST

Observed ground cover

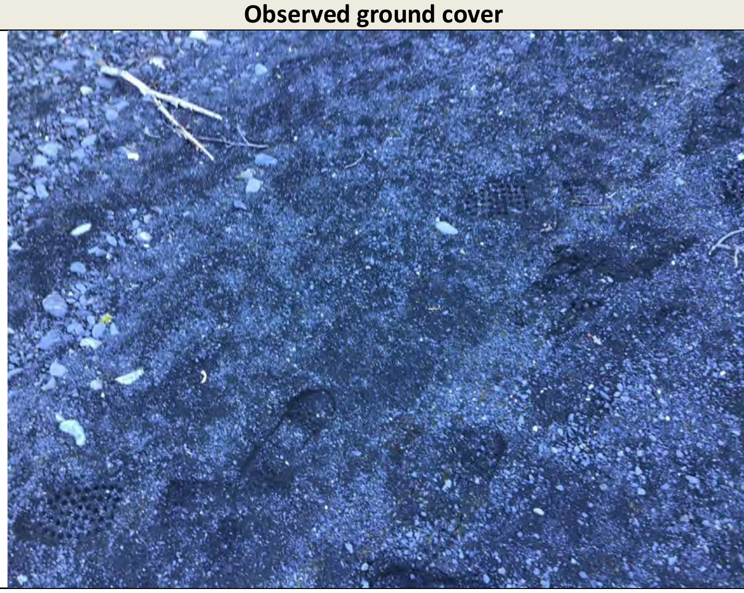


Photo Type: PP40	Location Description: 59.724382, -150.695850	Landscape: FACING SOUTH

Landscape: FACING WEST

Observed ground cover

Photo Type: PP41	Location Description: 59.722922, -150.695781	Landscape: FACING NORTH

Landscape: FACING WEST

Observed ground cover

Photo Type: PP42	Location Description: 59.722224, -150.695017	Landscape: FACING NORTH

Landscape: FACING EAST

Observed ground cover

Photo Type: PP43	Location Description: 59.721953, -150.694688	Landscape: FACING NORTH

Landscape: FACING EAST

HYDROLOGY

Photo Type: PP44	Location Description: 59.721816, -150.693346	Landscape: FACING SOUTH

Landscape: FACING WEST

Observed ground cover

Photo Type: PP45	Location Description: 59.721879, -150.691755	Landscape: FACING EAST

Landscape: FACING SOUTH

Observed ground cover

Photo Type: PP46	Location Description: 59.721698, -150.691212	Stream: FACING UPSTREAM

Stream: FACING DOWNSTREAM

Stream: FACING ACROSS

Photo Type: PP47	Location Description: 59.722209, -150.688189	Landscape: FACING EAST

Landscape: FACING SOUTH

Observed ground cover

Photo Type: PP48	Location Description: 59.722080, -150.686386	Landscape: FACING NORTH

Landscape: FACING EAST

Observed ground cover

# 1133.63471.02 Wetland Delineation	Dixon Diversion Project July 29-August 2, 2024	Site Photos SP1-21 PP1-PP85

Photo Type: PP49	Location Description: 59.721694, -150.686369	Stream: FACING UPSTREAM

Stream: FACING DOWNSTREAM

Stream: FACING ACROSS

Photo Type: PP50	Location Description: 59.721280, -150.685770	Stream: FACING UPSTREAM

Stream: FACING DOWNSTREAM

Stream: FACING ACROSS

Photo Type: PP51	Location Description: 59.723512, -150.688273	Landscape: FACING EAST

Landscape: FACING SOUTH

Observed ground cover

Photo Type: PP52	Location Description: 59.728355, -150.688837	Landscape: FACING NORTH

Landscape: FACING EAST

Observed ground cover

Photo Type: PP53	Location Description: 59.700831, -150.705248	Landscape: FACING NORTH

Landscape: FACING EAST

Observed ground cover

Photo Type: PP54	Location Description: 59.700632, -150.703699	Landscape: FACING EAST

Landscape: FACING SOUTH

Observed ground cover

Photo Type: PP55	Location Description: 59.701306, -150.704916	Landscape: FACING NORTH

Landscape: FACING WEST

Observed ground cover

Photo Type: PP56	Location Description: 59.701739, -150.705102	Stream: FACING UPSTREAM

Stream: FACING DOWNSTREAM

Stream: FACING ACROSS

Photo Type: PP57	Location Description: 59.701640, -150.704365	Landscape: FACING SOUTH

Landscape: FACING WEST

Observed ground cover

Photo Type: PP58	Location Description: 59.705491, -150.722894	Landscape: FACING SOUTH

Landscape: FACING WEST

SOILS: Soil plug

Photo Type: PP59	Location Description: 59.705013, -150.721804	Landscape: FACING NORTH
		
	Landscape: FACING EAST	
		
	SOILS: Soil plug	
		

Photo Type: PP60	Location Description: 59.706191, -150.720330	Landscape: FACING NORTH

Landscape: FACING SOUTH

Landscape: FACING WEST

Photo Type: PP61	Location Description: 59.705997, -150.719849	Landscape: FACING NORTH

Landscape: FACING EAST

Landscape: FACING SOUTH

Photo Type: PP62	Location Description: 59.705141, -150.719364	Landscape: FACING NORTH

Landscape: FACING SOUTH

Landscape: FACING WEST

Photo Type: PP63	Location Description: 59.705306, -150.718867	Landscape: FACING NORTH

Landscape: FACING SOUTH

Landscape: FACING WEST

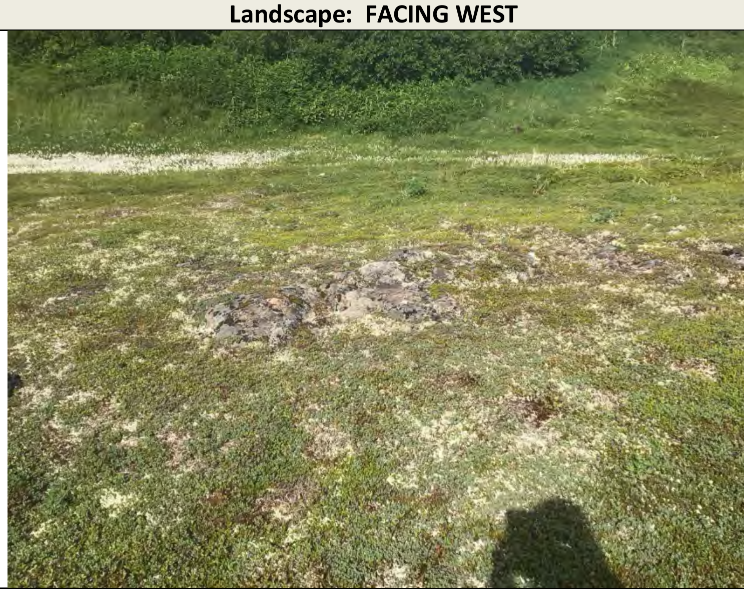


Photo Type: PP64	Location Description: 59.705302, -150.718011	Landscape: FACING NORTH

Landscape: FACING EAST

HYDROLOGY

# 1133.63471.02 Wetland Delineation	Dixon Diversion Project July 29-August 2, 2024	Site Photos SP1-21 PP1-PP85

Photo Type: PP65	Location Description: 59.704514, -150.719508	Stream: FACING UPSTREAM

Stream: FACING DOWNSTREAM

Stream: FACING ACROSS

Photo Type: PP66	Location Description: 59.703959, -150.720053	Stream: FACING UPSTREAM

Stream: FACING DOWNSTREAM

Stream: FACING ACROSS

Photo Type: PP67	Location Description: 59.703598, -150.719812	Landscape: FACING NORTH

Landscape: FACING SOUTH

Observed ground cover

Photo Type: PP68	Location Description: 59.702878, -150.717001	Landscape: FACING NORTH

Landscape: FACING SOUTH

Landscape: FACING WEST

Photo Type: PP69	Location Description: 59.700345, -150.707066	Stream: FACING UPSTREAM
		
	Stream: FACING DOWNSTREAM	
		
	Stream: FACING ACROSS	
		

Photo Type: PP70	Location Description: 59.700162, -150.707352	Landscape: FACING NORTH

Landscape: FACING SOUTH

Landscape: FACING WEST

Photo Type: PP71	Location Description: 59.699767, -150.707466	Stream: FACING UPSTREAM

Stream: FACING DOWNSTREAM

Stream: FACING ACROSS

Photo Type: PP72	Location Description: 59.699633, -150.708658	Stream: FACING UPSTREAM

Stream: FACING DOWNSTREAM

Stream: FACING ACROSS

Photo Type: PP73	Location Description: 59.701484, -150.707196	Landscape: FACING NORTH

Landscape: FACING EAST

Landscape: FACING WEST

Photo Type: PP74	Location Description: 59.701953, -150.707467	Stream: FACING UPSTREAM

Stream: FACING DOWNSTREAM

Stream: FACING ACROSS

Photo Type: PP75	Location Description: 59.702008, -150.708687	Landscape: FACING NORTH

Landscape: FACING WEST

Observed ground cover

Photo Type: PP76	Location Description: 59.702625, -150.708577	Landscape: FACING NORTH

Landscape: FACING EAST

Landscape: FACING WEST

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Stream: FACING DOWNSTREAM

Stream: FACING ACROSS

Photo Type: PP79	Location Description: 59.697830, -150.704291	Stream: FACING UPSTREAM

Stream: FACING DOWNSTREAM

Stream: FACING ACROSS

Photo Type: PP80	Location Description: 59.698604, -150.704776	Stream: FACING UPSTREAM

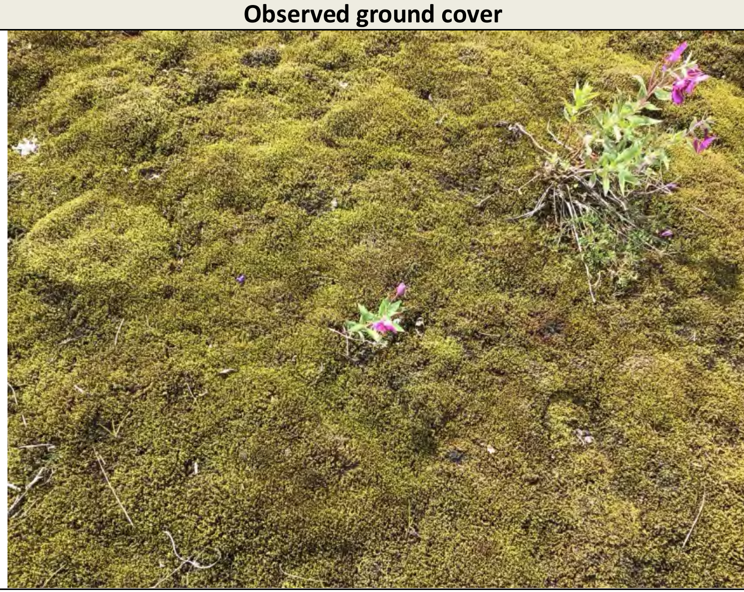
Stream: FACING DOWNSTREAM

Stream: FACING ACROSS

Photo Type: PP81	Location Description: 59.698199, -150.706933	Landscape: FACING NORTH

Landscape: FACING EAST

Observed ground cover



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Landscape: FACING EAST

Landscape: FACING WEST

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Landscape: FACING EAST

Landscape: FACING WEST

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Landscape: FACING EAST

Landscape: FACING WEST

Photo Type: PP85	Location Description: 59.755920, -150.853437	Landscape: FACING EAST
		
	Landscape: FACING SOUTH	
		
	Landscape: FACING WEST	
		

Scientific Name	Common Name	Indicator Status
Achillea millefolium	Common Yarrow	FACU
Aconitum delphiniifolium	Larkspur-Leaf Monkshood	FAC
Alnus incana	Speckled Alder	FAC
Alnus viridis	Sitka Alder	FAC
Angelica lucida	Seacoast Angelica	FACU
Artemisia biennis	Biennial Wormwood	FAC
Artemisia tilesii	Tilesius' Wormwood	FACU
Athyrium cyclosorum	Western Lady Fern	FAC
Calamagrostis canadensis	Bluejoint	FAC
Campanula rotundifolia	Bluebell-of-Scotland	UPL
Carex aquatilis	Leafy Tussock Sedge	OBL
Carex macrochaeta	Alaska Long-Awn Sedge	FACW
Carex microchaeta	Alpine-Tundra Sedge	FAC
Carex pluriflora	Several-Flower Sedge	OBL
Castilleja unalaschcensis	Alaska Indian-Paintbrush	FAC
Chamaenerion angustifolium	Narrow-Leaf Fireweed	FACU
Cornus suecica	Dwarf Bog Bunchberry	FAC
Deschampsia caespitosa	Tufted Hair Grass	FAC
Empetrum nigrum	Black Crowberry	FAC
Epilobium palustre	Marsh Willowherb	OBL
Equisetum arvense	Field Horsetail	FAC
Equisetum hyemale	Tall Scouring-Rush	FACW
Equisetum pratense	Meadow Horsetail	FACW
Eriophorum angustifolium	Tall Cotton-Grass	OBL
Eriophorum vaginatum	Tussock Cotton-Grass	FACW
Eurybia sibirica	Siberian Wood-Aster	FAC
Geranium erianthum	Woolly Crane's-Bill	FACU
Geum macrophyllum	Large-Leaf Avens	FAC
Gymnocarpium dryopteris	Northern Oak Fern	FACU
Heracleum maximum	American Cow-Parsnip	FACU
Iris setosa	Beach-Head Iris	FAC
Lepidium perfoliatum	Clasping Pepperwort	UPL
Lupinus arcticus	Arctic Lupine	FACU
Maianthemum dilatatum	Two-Leaf False Solomon's-Seal	FAC
Oplopanax horridus	Devil's-Club	FACU
Parnassia palustris	Marsh Grass-of-Parnassus	FACW
Petasites frigidus	Arctic Sweet-Colt's-Foot	FACW
Picea glauca	White Spruce	FACU
Plantago lanceolata	English Plantain	FACU
Platanthera aquilonis	Bog Orchid	FACW
Poa pratensis	Kentucky Blue Grass	FACU
Polemonium acutiflorum	Tall Jacob's-Ladder	FAC

Pyrola asarifolia	Pink Wintergreen	FACU
Rubus arcticus	Northern Blackberry	FAC
Rubus pedatus	Strawberry-Leaf Raspberry	FAC
Salix alaxensis	Felt-Leaf Willow	FAC
Salix barclayi	Barclay's Willow	FAC
Salix glauca	Gray-Leaf Willow	FAC
Salix pulchra	Diamond-Leaf Willow	FACW
Salix sitchensis	Sitka Willow	FAC
Sambucus racemosa	Red Elder	FACU
Sedum lanceolatum	spearleaf stonecrop	UPL
Sanguisorba canadensis	Canadian Burnet	FACW
Solidago simplex	Mt. Albert Goldenrod	UPL
Sorbus scopulina	Cascade Mountain-Ash	FACU
Spiraea stevenii	Steven's Meadowsweet	FACU
Swertia perennis	Felwort	FACW
Trichophorum caespitosum	Tufted Leafless-Bulrush	OBL
Trientalis europaea	Arctic Starflower	FACU
Vaccinium uliginosum	Alpine Blueberry	FAC
Vaccinium vitis-idaea	Northern Mountain-Cranberry	FAC
Veratrum viride	American False Hellebore	FAC
Viola palustris	Alpine-Marsh Violet	FACW

ATTACHMENT 2

2024 VEGETATION AND WILDLIFE HABITAT MAPPING REPORT

AMENDMENT TO BRADLEY LAKE HYDROELECTRIC PROJECT (FERC No. 8221), DIXON DIVERSION PROJECT

2024 Vegetation and Wildlife Habitat Mapping Study Report

Prepared for:

Alaska Energy Authority
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Anchorage, Alaska 99503-2495

Prepared by:

ABR
1225 E International Airport Rd #110
Anchorage, AK 99518

December 2024

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ACRONYMS AND ABBREVIATIONS

A

ABR	ABR, Inc.–Environmental Research & Services
ADF&G	Alaska Department of Fish and Game
AEA	Alaska Energy Authority
AVC	Alaska Vegetation Classification

B

Bradley Lake Project	Bradley Lake Hydroelectric Project (FERC No. 8221)

D

Dixon Diversion Project	Proposed Dixon Diversion, Amendment to the Bradley Lake Hydroelectric Project
DSP	Draft Study Plan

F

FERC	Federal Energy Regulatory Commission

G

GPS	Global Positioning System

I

ICD	Initial Consultation Document
ITU	Integrated Terrain Unit

N

NHD	National Hydrography Dataset

P

PM&E	Protection, mitigation, and enhancement

U

USACE	United States Army Corps of Engineers

1.0 INTRODUCTION

1.1 Background

The Alaska Energy Authority (AEA), Licensee and owner of the 120-megawatt Bradley Lake Hydroelectric Project (Bradley Lake Project; Federal Energy Regulatory Commission [FERC] No. P-8221), is pursuing a FERC license amendment. The purpose of the proposed amendment is to gain authorization to divert storm and seasonal meltwater coming from Dixon Glacier at the headwaters of the Martin River to the Bradley Lake to increase power production.

AEA filed an Initial Consultation Document (ICD) (Kleinschmidt Associates 2022a) with FERC on April 27, 2022. The ICD describes existing facilities and current Bradley Lake Project operations; characterizes the affected environment; and describes two proposed project alternatives for producing energy from Dixon Glacier meltwater. Following the ICD filing, AEA hosted Joint Agency and Public Meetings in Homer, Alaska on June 14, 2022 to discuss the ICD and receive stakeholder input. In November 2022, AEA filed a Draft Study Plan (DSP) (Kleinschmidt Associates 2022b) with FERC, based on the two alternatives, outlining ten studies, including the *Vegetation and Wildlife Habitat Mapping Study;* Stakeholders filed comments to the DSP in December 2022. AEA briefly paused the FERC amendment process while it conducted additional feasibility studies and narrowed down the proposed project alternatives.

Based on further investigations, AEA decided to move forward with the proposed alternative diverting Dixon Glacier meltwater to Bradley Lake (Dixon Diversion Project or Project). The proposed Project would include construction of: a diversion dam near the toe of the Dixon Glacier; an approximately 4.9-mile-long diversion tunnel bored through the mountain extending from Dixon Glacier to Bradley Lake, diverting water from the Martin River basin to Bradley Lake; approximately 1 mile of new, 16-foot-wide, gravel-surfaced access road from the existing Upper Battle Creek diversion access road to the outlet of the proposed diversion tunnel; and modification of the existing Bradley Lake Dam to raise the maximum normal pool elevation currently at 1,180 feet by as much as 7, 14, or 28 feet (1,208 feet elevation). The entire proposed Project is located on State-owned land.

AEA re-initiated the amendment process in 2024 by hosting public meetings in March and April 2024 to review the selected Project alternative, stakeholder comments to the

DSP and AEA's proposed modifications to the DSP. Consultation specific to this study can be found in Appendix A. AEA implemented several studies in 2024. This report describes the results of the *Vegetation and Wildlife Habitat Mapping Study* completed by ABR, Inc.–Environmental Research & Services (ABR) during 2024.

1.2 Modifications to the Draft Study Plan

The *Vegetation and Wildlife Habitat Mapping Study* DSP (Kleinschmidt Associates 2022b, Section 4.7) states that the Vegetation and Wildlife Habitat Mapping study area, would encompass the Wetland Delineation study area (DSP Section 4.6) with additional buffer sizes around project elements depending on the focal wildlife species list to be analyzed in the Wildlife Habitat Evaluation Study (DSP Section 4.8) and consultation with agency stakeholders. Consultation was initiated at the March 19, 2024 Terrestrial Resources Meeting. Subsequent to the meeting, Alaska Department of Fish and Game (ADF&G) and United States Fish and Wildlife Service (USFWS) provided recommendations for the vegetation and wildlife habitat mapping extent and/or wildlife species to include in the habitat evaluation analysis (Appendix A). A second consultation meeting was held on April 1, 2024 and AEA adopted the recommendations of both agencies. Accordingly, the fine-scale mapping extent for this study encompasses the impact area and a surrounding 250-meter- (820-foot-) wide buffer. In addition, broadscale mapping will be completed in a 2-kilometer- (1.2-mile-) wide area surrounding the proposed diversion tunnel inlet and outlet, new access road and Bradley Lake Dam to account for potential disturbance to certain focal wildlife species during construction.

1.3 Project Nexus

The proposed Dixon Diversion Project construction and operation activities would result in the alteration of wildlife habitats, which necessitates implementation of the *Vegetation and Wildlife Habitat Mapping Study*, in combination with the *Wildlife Habitat Evaluation Study* to address potential impacts to wildlife habitats. According to published documentation, 97 bird species and 27 mammal species are known or likely to occur in the vicinity of the Bradley Lake Project (United States Army Corps of Engineers [USACE] 1982; Alaska Power Authority 1984; FERC 1985). The proposed action would include construction of an approximately 1-mile-long 16-foot-wide road and modification of the Bradley Lake Dam to raise the maximum pool elevation which would result in the loss of habitat to birds, mammals, and amphibians, ranging from 94 acres for the 7-foot pool raise alternative to 404 acres for the 28-foot pool raise alternative. Additionally, the partial diversion of the Dixon Glacier meltwater, would seasonally reduce flows in the Martin

River affecting water quality and riparian habitat. There would also be temporary construction activity impacts on wildlife including increased noise and human disturbance in the area.

The *Vegetation and Wildlife Habitat Mapping Study* facilitates a quantification of habitat alternation post-construction, stratified by focal species and habitat value. The wildlife habitat map of current pre-Dixon Diversion Project conditions, combined with the *Wildlife Habitat Evaluation* (to be completed in 2025), will identify habitats for the focal wildlife species and define the extent of the most valuable habitats for each species in the area. Valuable habitats may be classified by a variety of factors including the number of species using individual habitats, relative rarity of the habitat, and seasonal habitat use. This quantification will allow for a spatially explicit identification of habitats that may benefit from protection, mitigation, and enhancement (PM&E) measures across a variety of potentially impacted wildlife species.

2.0 GOALS AND OBJECTIVES

The overall goals of the *Vegetation and Wildlife Habitat Mapping Study* are to prepare baseline maps of the existing and predicted future vegetation and wildlife habitats in those areas of the Dixon Diversion Project that would undergo habitat loss (from the expansion of Bradley Lake and the placement of fill for project infrastructure) and habitat change (from reductions in flow in the Martin River). This mapping information, in conjunction with the categorization of habitat values for wildlife species in the *Wildlife Habitat Evaluation Study*, will be used to assess impacts to wildlife resources from the proposed Dixon Diversion Project alternatives. The information from the two studies will be used in the FERC license amendment application to quantitatively assess habitat loss and habitat alteration effects from the proposed expansion for the set of wildlife species considered to be of most concern to Bradley Lake Project stakeholders (to be determined in consultation with resource management agencies). The results of the two studies also will be used to develop any necessary PM&E measures to minimize the impacts to wildlife habitats. The information on predicted future wildlife habitats developed in this study will be used in conjunction with the results of the *Wildlife Habitat Evaluation* to evaluate how wildlife resources in the area may change in the future because of the proposed Dixon Diversion Project.

The specific objectives of the Vegetation and Wildlife Habitat Change Study are to:

1. Identify, delineate, and map existing vegetation and wildlife habitat types in the study area based on an expansion of the more narrowly delimited vegetation and wetland map to be prepared in the *Wetland Delineation Study*.
2. Quantify long-term habitat change in the Dixon Diversion Project study area by preparing a wildlife habitat map depicting predicted future habitats (based on both proposed construction and operation impacts).

Specific products of the study will include vegetation and wildlife habitat maps for existing and future conditions and an impact assessment (prepared in the FERC license amendment application) for the habitats of focal wildlife species of concern.

3.0 STUDY AREA

The study area for the *Vegetation and Wildlife Habitat Mapping Study* was developed in consultation with the ADF&G and USFWS during March and April 2024 (Appendix A). The study area for fine-scale vegetation and wildlife habitat mapping consists of the impact area and a 250-meter (820-foot) buffer around the maximum proposed Bradley Lake pool elevation, the dam and spillway, the proposed access road, and the Martin River from the toe of the Dixon Glacier to its confluence with Kachemak Bay (Figure 4-1). In addition, broadscale targeted wildlife habitat mapping will occur within a 2-kilometer (1.2-mile) buffer area surrounding the proposed Dixon diversion dam, new access road, and Bradley Lake Dam (Figure 4-1).

In 2024, fine-scale mapping was completed within the impact area and the 250-meter-wide buffer area around the proposed Bradley Lake maximum pool elevation, the dam and spillway, and the proposed access road. The 2024 mapped area is 6,426 acres and immediately abuts but does not include portions of the Kenai National Wildlife Refuge. The remaining area will be mapped in 2025.

4.0 METHODOLOGY

4.1 Mapping Approach

Wildlife habitats were mapped using a hierarchical methodology based on Integrated Terrain Unit (ITU) mapping methods developed for Ecological Land Surveys conducted in tundra, boreal forest, and coastal regions in Alaska (see Wells et al. [2014] for an example study in Kenai Fjords National Park). The ITU mapping approach involves mapping individual terrain units such as vegetation type, physiography, surface form, and disturbance type, and then combining them into composite units, which represent the range of land cover variation in the study area. When deriving wildlife habitats, ITUs are aggregated into broader, ecologically important categories that represent the habitats used by wildlife in the study area. A vegetation map at Level IV of the Alaska Vegetation Classification (AVC; Viereck et al. 1992) and a wildlife habitat map based on the best combination of ITUs will be produced to yield a habitat map that accurately reflects current use by wildlife.

Within the study area, map polygon boundaries were digitized on-screen using ArcGIS software. Polygon boundaries for the ITU variables were determined by photointerpretation of landscape features on high-resolution aerial and satellite imagery.

Interpretation of landscape features and ITU variables was supported by ground-reference survey data collected during summer 2024 (see Section 5.1 Field Survey, below). All mapping was conducted at a scale of 1:5,000 and the minimum mapping polygon size was 0.5 acre. In cases where vegetation types were small or not easily distinguished in aerial photography, the mapping scale was reduced to 1:2,000. A preliminary desktop vegetation map was prepared prior to the field studies to guide the selection of the field sample sites and then the preliminary map was updated after field data collection was complete.

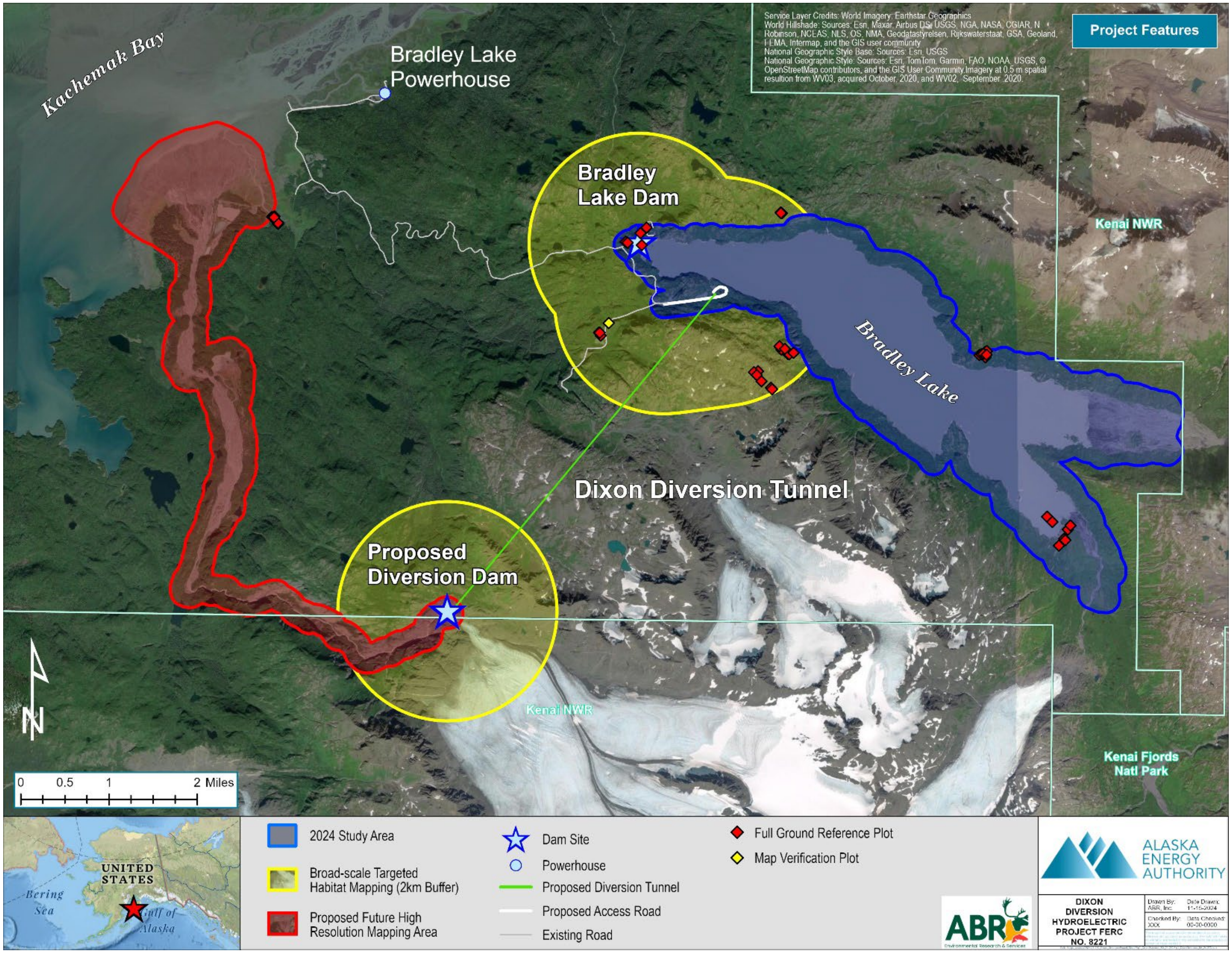


Figure 4-1 Vegetation and Wildlife Habitat Mapping Study Area Boundaries for the Dixon Diversion Project, 2024 Study Area and Future Mapping Areas.

Each map polygon was assigned the following ITU attributes:

1. Vegetation type/land cover class—uses the Level IV AVC described by Viereck et al. (1992) with additions by ABR for vegetation types not described in the AVC and non-vegetated land cover types; AVC Level IV classes are defined by vegetation structure and dominant plant species (e.g., open white spruce forest, closed tall alder shrub, subarctic lowland sedge wet meadow).
2. Physiography class—represents broad, landscape-scale geomorphic features and landscape position (e.g., riverine, lacustrine, lowland, upland, subalpine, alpine).
3. Surface form class—represents finer scale geomorphic features, (e.g., ridge crest, toeslope, kettle basin, point bar); the physiographic classes used were modified from Washburn (1973) and Jorgenson et al. (2003).

To capture low-flow streams that are known to be present but difficult to detect using remote sensing alone, National Hydrography Dataset (NHD) flowlines were reviewed in conjunction with the ITU mapping. Where NHD flowlines indicated a stream was likely to be present, a stream was added to the map. The specific location of these streams was based on features visible in high-resolution imagery and elevation data.

4.2 Derivation of Wildlife Habitats

After the ITU mapping in the study area was completed, a final set of wildlife habitat types was derived from the mapping of physiography and AVC Level IV vegetation types. In the aggregation process, physiographic location, vegetation structure (e.g., forest, tall scrub, low scrub, dwarf scrub, meadow), and dominant plant species were the primary factors assessed when determining combinations of landscape features that would be used similarly by wildlife. In deriving wildlife habitat types, emphasis was placed on those vegetation and landscape features known to be important for wildlife, such as food availability (vegetation forage species and prey species habitats), nest and den site characteristics (geomorphic and vegetation features), and security, escape, and shelter habitats (vegetation cover). Dominant plant species as well as species composition were considered when defining scrub habitats in particular; for example, habitats supporting low willows or tall willows and alders combined were treated separately from other shrub-dominated habitats because of the importance of willows for moose browse. Because the wildlife habitat types mapped in this study will be used directly in the *Wildlife Habitat Evaluation Study*, the study team's goal in the aggregation process was to derive a set of wildlife habitat types that would be meaningful in assessing habitat value for the specific set of bird, mammal, and amphibian species that occur in the Project area including the target list of mammals already identified for the targeted wildlife habitat mapping area (2-kilometer [1.2-mile] buffer).

4.3 Field Surveys

The 2024 field effort was a brief reconnaissance survey focused on collecting ground reference data for the 2024 study area as well as gathering limited data for the future mapping areas to support potential desktop efforts prior to the 2025 field season. A group of two scientists, accompanied by a bear guard, collected ground reference data on vegetation and wildlife habitats. Two types of survey plots were sampled: full ground reference plots and map verification plots (see below). A typical plot consisted of a roughly circular area with a radius of approximately 30 feet (9 meters), located within relatively homogeneous vegetation. Plot size and shape were modified as needed, based on the spatial extent of the plant community being sampled (e.g., narrower plots were used in estuarine fringe habitats).

Data collected at full ground reference plots included vascular plant species composition and visual areal cover estimates for vascular plants to facilitate the proper classification of vegetation types at AVC Level IV (Viereck et al. 1992). Field determinations of Level IV vegetation classes were also recorded; these field calls were reviewed later in the office and revised when needed based on the recorded plant cover data. Additional data recorded included the percent areal cover (visually estimated) of each structural class of vascular plants (trees, saplings, tall shrubs, low shrubs, dwarf shrubs, tall herbs, low herbs) and nonvascular plants (floating aquatics, aquatic plants, mosses, and lichens). Descriptive soils information, including the depth of surface organic horizons and the dominant mineral soil texture, were recorded. These data were used to assist in defining vegetation and wildlife habitat types and to evaluate the potential value of wildlife habitats for birds, mammals, and amphibians. Site characteristics recorded at each plot included physiography and surface form, as described by Jorgenson et al. (2003) and Schick and Davis (2008), and slope and aspect (in degrees). Digital photographs were taken of the vegetation and soils (see below) at each plot, global positioning system (GPS) coordinates were recorded, and any indications of human use (recreational or subsistence use) or wildlife use (e.g., nests, dens, scat, tracks) were also noted.

In addition to the full ground reference plots, map verification plots were sampled at locations selected in the field to help facilitate the vegetation and wildlife habitat mapping efforts. Map verification plots are designed to improve map accuracy while requiring minimal field sampling time. Map verification plots were sampled in habitats that had been previously well documented with full ground reference plots and provided additional replication to confirm the links between photo-signatures and ground data. A limited set of data elements was collected at map verification plots, including cover estimates for the dominant vascular plant species, Level IV vegetation class (Viereck et al. 1992), physiography class, U.S. Fish and Wildlife Service National Wetland Inventory wetland type and water regime class, site photos, and GPS coordinates. No soils information was recorded at map verification plots.

All field data were recorded on customized, ABR-prepared applications, running on Android tablet computers. Navigation at the site was aided by using ArcGIS Collector software (accessed through ArcGIS online), which allowed real-time depictions of plot locations in the field over the same satellite imagery used in the mapping. Upon completion of field work, the data were uploaded to a wetland-specific relational database maintained on ABR servers and were subjected to a set of sequential data quality assurance/quality control procedures to ensure data accuracy before being used to prepare the habitat map.

4.4 Future Mapping Efforts

The 2024 mapping effort as noted above is limited to the 250-meter (820-foot) buffered area surrounding the Bradley Lake potential maximum pool elevation, Bradley Lake Dam, and the proposed access road. Future mapping efforts to support the study goals and agency requests are as follows:

1. Fine scale vegetation and wildlife habitat mapping of the Martin River floodplain and estuary which will support the *Wildlife Habitat Evaluation Study*. The Martin River mapping area will rely heavily on the results of the *Hydraulic Modeling, Geomorphology, and Aquatic Habitat Connectivity Evaluation Study* (Kleinschmidt Associates 2022b).
2. A limited set of data points were collected in the Martin River estuary in 2024 to support any potential future desktop mapping efforts.
3. Broad-scale wildlife habitat mapping limited to a set of preferred habitats for the list of focal mammal species within a 2-kilometer (1.2-mile) buffer of the proposed Dixon diversion dam, the existing Bradley Lake Dam, and the proposed access road as requested by the ADF&G during the draft study plan review.
4. A limited set of data points were collected in the broadscale wildlife habitat mapping area in 2024 to support any potential future desktop mapping efforts.

4.5 Vegetation and Wildlife Habitat Change Detection

In the determination of future habitats post-construction, measurable natural changes to vegetation community structure (spruce bark beetle kill and plant succession), along with direct climate change effects (increased temperatures and precipitation), and indirect climate change effects (extreme weather events beyond the long-term climate normals) will be considered along with Dixon Diversion Project disturbances to predict how wildlife habitats will develop in the future. Information on long-term habitat change at the Eklutna Hydroelectric Project in Southcentral Alaska and along the lower Bradley River will also be used to predict future habitats in the Dixon Diversion Project area.

Habitat change from Dixon Diversion Project development will be measured by comparing the current and post-project wildlife habitat maps and calculating the acreage of habitat loss, alteration, or gain for specific habitats, and the loss or gain in habitat value using the habitat-value ranking results from the *Wildlife Habitat Evaluation Study*. These results can be used to target elements of the Dixon Diversion Project with the highest impacts to individual species for use in developing PM&E measures. Mapping for the wildlife habitat change detection will be completed in 2025.

5.0 RESULTS

Preliminary desktop vegetation mapping and field survey was completed June-July 2024, and ITU mapping and development of wildlife habitats was completed in November 2024. Seventeen vegetation and land cover classes were mapped, and 17 wildlife habitat types within lacustrine, riverine, and subalpine physiographic zones were derived from the mapped ITU variables. Field survey and mapping results are presented below.

5.1 Field Survey

The *Vegetation and Wildlife Habitat Mapping Study* field survey was conducted from July 29 to August 1, 2024 by ABR. A total of 45 full ground reference plots (Appendix B) and 1 map verification plot (Appendix C) were sampled (Figure 4-1). A total of 18 plots were completed within the boundaries of the 2024 study area, 22 plots were completed within the broadscale focal species wildlife habitat mapping area and 6 plots in the Martin River estuary. Many of the plots in the focal species wildlife habitat mapping area were near the 2024 study area to capture characteristics that range across all mapping areas; however, some field data will be reserved for use in future mapping phases of this project. Plots in the 2024 study area were limited to three physiography types. Several vegetation types that were sampled in the field were not mapped because they occurred only in small, isolated patches and/or their photo-signatures could not be reliably distinguished from other similar vegetation types. Most of the unmapped vegetation types were uncommon and infrequently encountered during the field sampling, but they do help to illustrate the full range of vegetation types that occur in the study area.

5.2 Physiography

Three physiography types were mapped in the study area and are described in Table 5-1. Subalpine physiography occurs above tree line and is characterized by both low and tall shrub thickets and openings of dwarf scrub, evergreen tree woodland, barren outcrops, and forb-dominated meadows. In the 2024 study area, the subalpine zone encompasses the entire 250-meter (820-foot) buffer zone surrounding the proposed facility upgrades and the max fill level of Bradley Lake. Lacustrine physiographic areas are dominated by lacustrine processes (lakes and ponds and associated areas where the hydrology is largely controlled by the adjacent waterbody). In the 2024 study area, lacustrine features include Bradley Lake and small ponds along the Battle Creek diversion outlet that are artificially controlled and naturally occurring small ponds in basins and slope breaks throughout the subalpine physiographic zone. Riverine physiographic areas include rivers and streams and associated areas that are influenced by riverine processes, the most important of which are flood events. Extended mapping areas for the focal wildlife species habitat mapping and the Martin River corridor and estuary will include additional physiographic zones.

Table 5-1 Physiography class descriptions for the Vegetation and Wildlife Habitat Mapping Study Area completed in 2024.

Physiography	Description	Acres	Percent of Study Area
Lacustrine	Driven by lacustrine processes in which the waterbody is the dominant feature; includes open water, shoreline emergent vegetation zones, and adjacent wetlands where water levels are controlled by the lake.	3,440.5	54.0
Riverine	More than just a proximal relationship with rivers and streams; riverine communities show evidence of influence by riverine processes, particularly hydrology.	664.4	10.0
Subalpine	Defined by elevation and corresponding lack of trees; tall and low shrubs are typically present; often steeply sloping.	2,321.4	36.0
	Total	**6,426.2**	**100.0**

5.3 Vegetation and Surface Form

The 17 vegetation and land cover classes mapped in the study area and the acreage occupied by each are listed in Table 5-2. The 17 classes are comprised of 4 tall scrub classes, 2 low scrub classes, 3 dwarf shrub classes, 2 mesic meadow classes, 2 wetland meadow classes, 1 mosaic type, 2 barren or partially vegetated classes, and 1 freshwater landcover type. Several of the vegetation types mapped are not described in Viereck et al. (1992) but were developed by ABR for previous studies in Alaska to address additional plant communities that occur in the state (e.g., barren and partially vegetated classes). The mosaic class was developed for this study specifically to address areas that are too finely intermingled to be accurately mapped at a 1:5,000 scale. Aside from the prevalence of freshwater landcover types accounted for by Bradley Lake itself, the study area is strongly dominated by low and tall scrub and barrens vegetation types; herbaceous-dominated vegetation is much less prevalent (Table 5-2, Figures 5-1 and 5-2.).

Each vegetation class polygon was assigned a representative surface form. A total of 14 surface forms were mapped in the study area: basins or depressions; drainage, fluvial bar; human modified, infrastructure; lake margins; river or stream, variable channel characteristics; undifferentiated slope; steep slope, rocky cliff, undulating; and persistent waterbodies. Surface forms were used to group similar vegetation types into wildlife habitats.

Table 5-2 Vegetation type and physiography relationships in the 2024 Vegetation and Wildlife Habitat Mapping Study Area.

Vegetation/Land Cover Class	Physiographic Occurrence	Mapped Area (acres)	Percent of Study Area
Barren	Lacustrine	81.6	1.3
Fresh Water	Lacustrine	3,358.9	52.3
Barren	Riverine	359.1	5.6
Partially Vegetated	Riverine	5.4	0.1
Subarctic Lowland Sedge-Moss Bog Meadow	Riverine	0.6	<0.1
Closed Low Willow	Riverine	5.0	0.1
Open Low Willow	Riverine	258.8	4.0
Closed Tall Willow	Riverine	3.4	0.1
Fresh Water	Riverine	32.1	0.5
Barren	Subalpine	56.4	0.9
Partially Vegetated	Subalpine	28.5	0.4
Mixed Herbs	Subalpine	1.3	<0.1
Bluejoint-Shrub	Subalpine	2.2	<0.1
Subarctic Lowland Sedge Wet Meadow	Subalpine	1.6	<0.1
Subarctic Lowland Sedge-Moss Bog Meadow	Subalpine	0.5	<0.1
Ericaceous-Lichen Dwarf Shrub Tundra	Subalpine	2.1	<0.1
Mountain-heath Dwarf Shrub Tundra	Subalpine	204.1	3.2
Closed Tall Alder	Subalpine	1,444.0	22.5
Closed Tall Willow	Subalpine	0.2	<0.1
Open Tall Alder	Subalpine	342.9	5.3
Open Tall Alder-Willow	Subalpine	7.7	0.1
Fresh Water	Subalpine	0.2	<0.1
Complexes	Subalpine	182.4	2.8
Ericaceous Dwarf Shrub Tundra	Subalpine	47.0	0.7
	Total	**6,426.2**	**100.0**

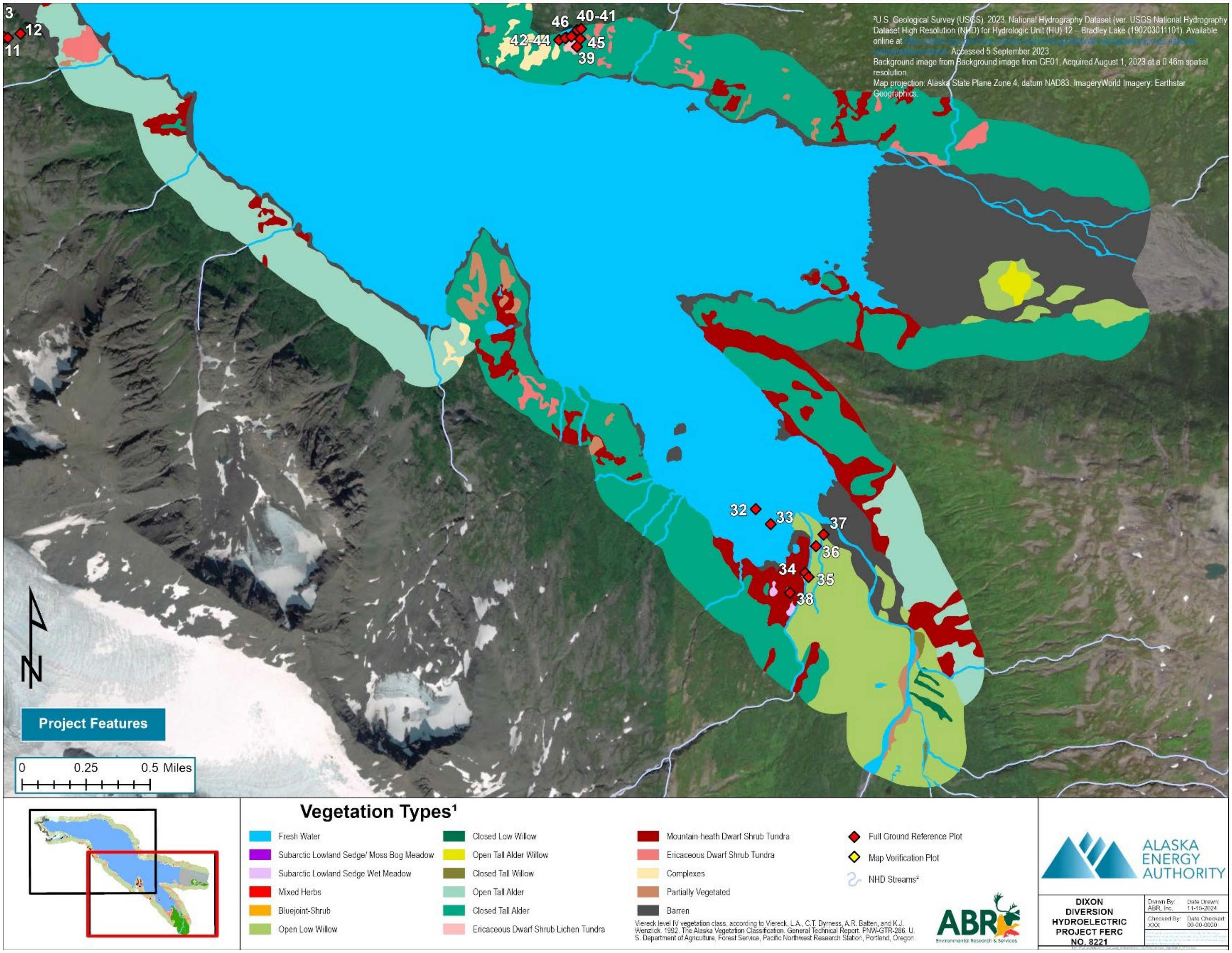


Figure 5-1 Vegetation Types within the 2024 Vegetation and Wildlife Habitat Mapping Study Area, East.

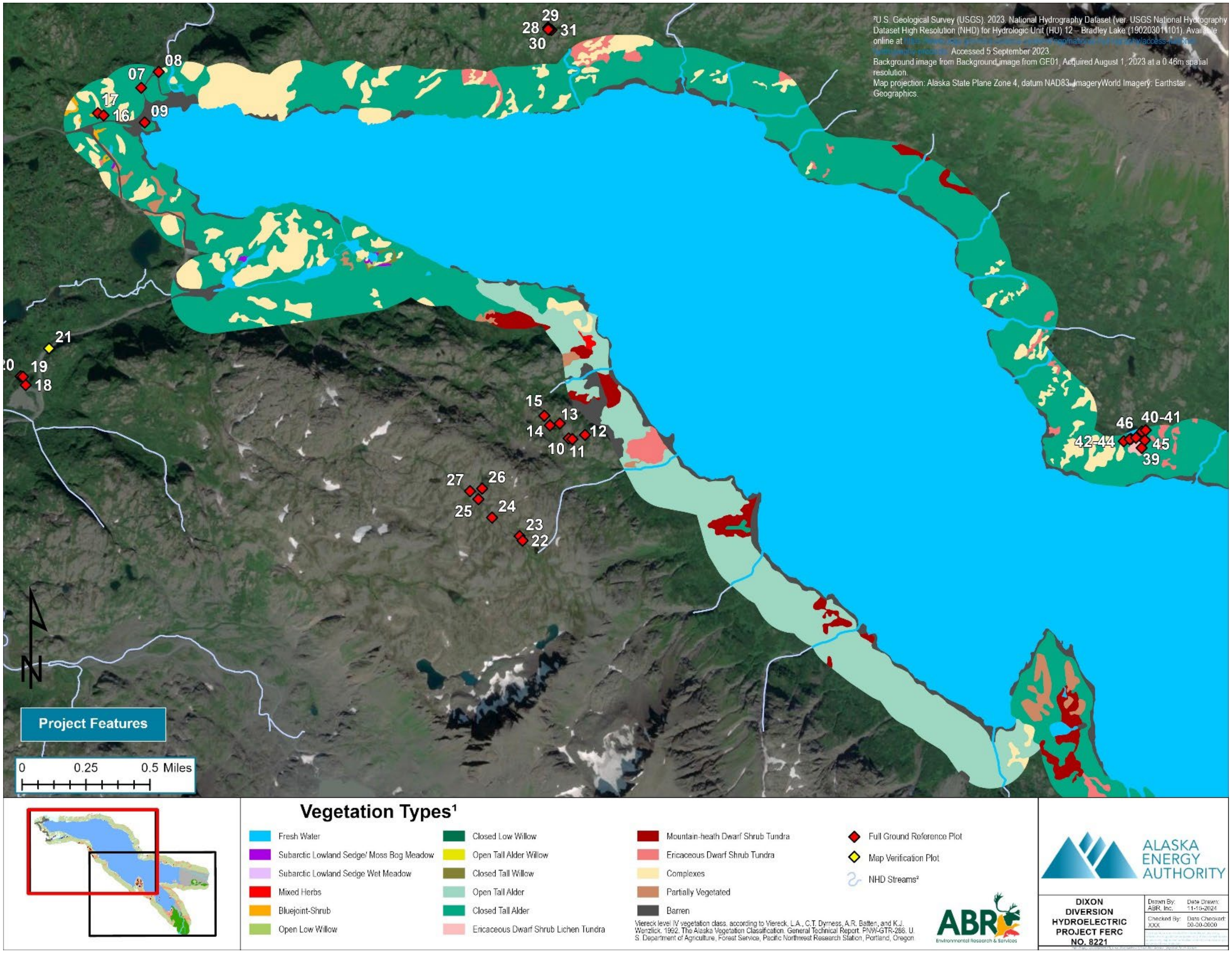


Figure 5-2 Vegetation Types within the 2024 Vegetation and Wildlife Habitat Mapping Study Area, West.

5.4 Wildlife Habitat Types

As described above the physiography, vegetation and land cover classes, and surface forms were combined and aggregated to develop the final set of 17 wildlife habitat types that were mapped in the study area (Table 5-3, Figures 5-3 and 5-4).

Upland and Subalpine Tall Alder Scrub is the most extensive habitat except for the Lakes habitat, covering 28 percent of the study area (Table 5-3, Figures 5-3 and 5-4). Upland and Subalpine Tall Alder Scrub occurs on steep to moderately sloped hillsides above Bradley Lake (Figures 5-3 and 5-4). Soils range from well-drained and rocky to more poorly drained with well-developed surface organic horizons. The open to closed canopy scrub communities are dominated by the tall alder shrubs *Alnus sinuata,* with *Sambucus racemosa* (red elderberry), *Rubus spectabilis* (salmonberry), and *Oplopanax horridus* (devil’s club) typically present. Understory species commonly present include *Dryopteris dilatata* (spreading woodfern) and *Geum macrophyllum* (largeleaf avens).

The most extensive habitat in the study area is Lakes, covering over 50 percent of the study area (Table 5-3). Bradley Lake, a deep reservoir lake in the valley bottom, is the only lake in the study area (Figure 4-1). Bradley Lake is over 3,344 acres in size, greater than 100 feet deep, and is comprised entirely of unvegetated freshwater with some small islands interspersed. The lakeshores have poorly developed littoral zones and are primarily comprised of barren cobble beaches and rocky cliffs (Rocky Shore and Cobble Beach habitat, approximately 1 percent of the study area), except for a large mudflat that develops during low water at the southeast end of the lake. A data point is available (Dixon-33, Appendix B) for the mudflat, but it was not mapped because it is not exposed in the imagery used to delineate wildlife habitats.

Riverine Low and Tall Willow comprise approximately 4 percent of the study area and is found primarily on the active floodplain of the lake inlet on the east side of the lake (Table 5-3). Willow species include *Salix pulchra* (diamond leaf willow), *S. commutata* (undergreen willow), and *S. alaxensis* (feltleaf willow), often with a significant graminoid species component of *Agrostis exarata* (spike bentgrass), *Calamagrostis canadensis* (bluejoint), and *Deschampsis cespitosa* (tufted hairgrass). This habitat occurs on the active floodplain which receives overbank flooding from the adjacent glacial and clearwater streams but may also be influenced by the artificial fluctuations in lake level on Bradley Lake. A closely related habitat to Riverine Low and Tall Willow is Riverine Barrens, which comprises approximately 7 percent of the study area and is limited to the active braided channel systems next to the two glacial fed inlet streams to Bradley Lake.

The Glaciated Subalpine Rock-Shrub Scrub-Meadow Complex is unique to the Bradley Lake area and is a finely intermixed mosaic of vegetation types occurring on complex undulating glaciated terrain. As described in Table 5-3, the complex is comprised of small patches of barren exposed bedrock and colluvium, dwarf shrub tundra, alder and willow scrub, and herb meadow. The small patches of vegetation making up this habitat are too small to accurately delineate at the 1:5,000 mapping scale and would largely fall below the 0.5-acre minimum mapping size. Because the terrain features of this undulating surface form are so complex, the Glaciated Subalpine Rock-Shrub Scrub-Meadow Complex was determined to act as an individual wildlife habitat, especially for the list of large mammal focal species of interest in this project.

The Upland and Subalpine Wet Graminoid Moss Bog comprises less than 1 percent of the study area and occurs in small discrete patches on the landscape, often well below the minimum mapping size (Table 5-3). Nevertheless, wetlands are not a significant component of the 2024 study area. These wetlands typically occupy shallow basins or slope breaks along the mountainsides and are often characterized by deep accumulation of organic moss peat. Vascular plant dominants include *Trichophorum caespitosum* (tufted bullrush), *Carex saxatilis* (russet sedge), *C. rotundata* (round sedge), *Eriophorum vaginatum* (tussock cottongrass), *Polygonum viviparum* (alpine bistort), and *Swertia perenis* (felwort).

Table 5-3 Wildlife habitat type descriptions and acreages in the Vegetation and Wildlife Mapping Study Area, 2024.

Habitat Type	Description	Acres	Percent of Study Area
Lakes	Bradley lake reservoir is the only mapped lake in the area. It is a deep, >3,000-acre glacial fed lake with steep rocky shorelines and cobble beaches. At low water levels extensive mud flats become exposed on the east side of the lake. Because the lake is a reservoir the lake levels fluctuate significantly on an annual basis. The shorelines have relatively little development of littoral fringe plant communities and there is little to no emergent or floating vegetation.	3,343.9	52.0
Ponds	Shallow ponds (>4 acres) forming along drainage courses or in glacially carved depressions. Ponds have relatively poorly developed littoral zones typically forming along a drainage path within a slope break. Several human modified ponds have resulted along the outlet stream of the Battle Creek diversion tunnel.	15.2	0.2
Rocky Shore and Cobble Beach	Gently sloping barrens along the shoreline of Bradley Lake. This habitat often occurs where drainageways join the Bradley Lake basin. There is little to no vegetation and the substrate consists of coarse fragments from gravels to boulders except for the development of an extensive mud flat at low water levels on the southeast inlet to Bradley Lake.	81.6	1.3
Rivers and Streams (High gradient-high flow)	Permanently flooded channels of freshwater on steeply sloping terrain with high flow. In the 2024 study area, this habitat is limited to sections of the outlet channel of the Battle Creek diversion.	2.8	<0.1

Habitat Type	Description	Acres	Percent of Study Area
Rivers and Streams (Low gradient-high flow)	Permanently flooded channels of freshwater on gently sloping terrain with high flow. Sources of water are glacial meltwater, glacial lakes, and surface water runoff. Within the 2024 study area, this habitat is limited to the main channels flowing through the braided river deltas at the east side of Bradley Lake and the outflow from the Bradley Lake Dam spillway.	25.2	0.4
Rivers and Streams (Mixed gradient-low flow)	Permanently flooded channels of freshwater flowing on steep terrain interspersed with more gradual terrain and flow is low. Small perennial streams flowing throughout the 2024 study area which may originate from springs but primarily fed by snowmelt and surface water runoff. Typically, very narrow channels with poorly developed or non-existent floodplains.	4.1	0.1
Riverine Barrens	Flat gravel bars in a braided channel system on active glacial outwash deposits. Substrates are extremely well drained sand and gravels. Vegetation may be present at up to 30% cover and consists of pioneer *Salix* and *Alnus* species, as well as forbs such as *Equisetum arvense*.	364.4	5.7
Riverine Low and Tall Willow	Occurs predominantly on the margins of active braided river systems on the east end of Bradley Lake. Substrates are composed of well drained sands and gravels with limited organic horizon development. The soil profile indicates that frequent flooding occurs within these areas from the adjacent glacial fed stream and numerous clear water tributaries. Vegetation is dominated by willow species *Salix pulchra*, *S. commutate*, and *S. alaxensis*, often with a significant graminoid component including *Agrostis exarata*, *Calamagrostis canadensis*, and *Deschampsia cespitosa*. Fluctuations in reservoir levels also contribute to the hydrology of this habitat type.	267.2	4.2

Habitat Type	Description	Acres	Percent of Study Area
Upland and Subalpine Wet Graminoid Moss Bog	Occurs in shallow basins along stream-courses or in protected subalpine basins, with deep accumulation of organic material. Dominated by sphagnum moss species with graminoid and herb species assemblages including *Trichophorum caespitosum*, *Carex saxatilis*, *C. rotundata*, *Eriophorum vaginatum*, *Polygonum viviparum*, and *Swertia perenis*.	2.8	<0.1
Upland and Subalpine Herb Meadow	Occurs on steeply sloping clearings within tall shrub communities in the subalpine and upland physiographic zones. Soils are typically mesic to dry, sometimes in areas with late lying snowbeds. In upland areas this type may be characterized by a mix of shrubs, graminoids, and forbs, including *Rubus spectabilis*, *Calamagrostic canadensis*, *Spirea douglasii*, and *Epilobium angustifolium*. In the subalpine, the habitat may include *Carex macrochaeta*, *Sanguisorba stipulata*, *Sedum rosea*, *Calamagrostis canadensis*, *Artemisia arctica*, and *Salix chamissonis*.	3.5	0.1
Upland and Subalpine Tall Alder Scrub	Slopes varying from gentle to steep, occurring throughout the upland and subalpine zones. This type can occur in rocky drainageways, steep slopes, and in protected drainages at higher elevations. Substrates are well drained and range from rocky with very little organic accumulation to deep organic deposits on more moderate slopes and lower elevations. Dominated by shrub species including *Alnus sinuata*, *Rubus spectabilis*, *Betula kenaica*, and *Oplopanax horridus*. Understory species include *Athyrium filix-femina* ssp. *cyclosorum* and *Dryopteris diliatata*.	1,794.6	27.9

Habitat Type	Description	Acres	Percent of Study Area
Glaciated Subalpine Rock-Shrub Scrub-Meadow Complex	Occurs on undulating glaciated terrain featuring steep-sided features with exposed bedrock, partially vegetated colluvial deposits, deep ravines, and basins or depressions. Soil characteristics typically range from mesic to extremely well-drained depending on the landscape position with the undulating terrain. The vegetation is a finely intermixed mosaic of exposed bedrock and colluvium, dwarf shrub tundra, mesic herb meadow, and alder shrub occurring in small patches and in close proximity. Dwarf shrub species such as *Empetrum nigrum* and *Vaccinium uliginosum* dominate the higher elevation, exposed areas, while low to tall *Alnus sinuata* and *Rubus spectabilis* shrubs dominate the incised, protected areas.	182.4	2.8
Subalpine and Alpine Dwarf Ericaceous Scrub	Occurs on exposed ridges and convex sloping terrain within the subalpine slopes above Bradley Lake. Typically, thin organic layer overlying extremely well drained colluvial material. Vegetated cover is dominated by dwarf shrubs including *Harimanella stelleriana*, *Vaccinium uliginosum*, *Empetrum nigrum*, and *Phyllodoce empetriformis*.	253.2	3.9
Subalpine and Alpine Barrens	Barren or partially vegetated areas on extensive exposed bedrock and mineral soil on exposed ridge crests. Soils lack an organic horizon and substrates range from exposed bedrock to coarse, excessively drained gravels. Vegetation, where present, is <30% of cover and consists of dwarf shrubs such as *Loiseleuria procumbens*, *Empetrum nigrum*, and dwarf *Salix* species.	42.1	0.7
Rocky Cliffs	Steep, unvegetated, and unweathered parent material generally found along the shoreline of Bradley Lake.	22.8	0.4

Habitat Type	Description	Acres	Percent of Study Area
Artificial Fill	Fill or recently modified surfaces that have been modified by human activity and are barren. Areas within the impact assessment area include access roads and the existing dam infrastructure.	20.3	0.3
	Total	**6,426.2**	**100.0**

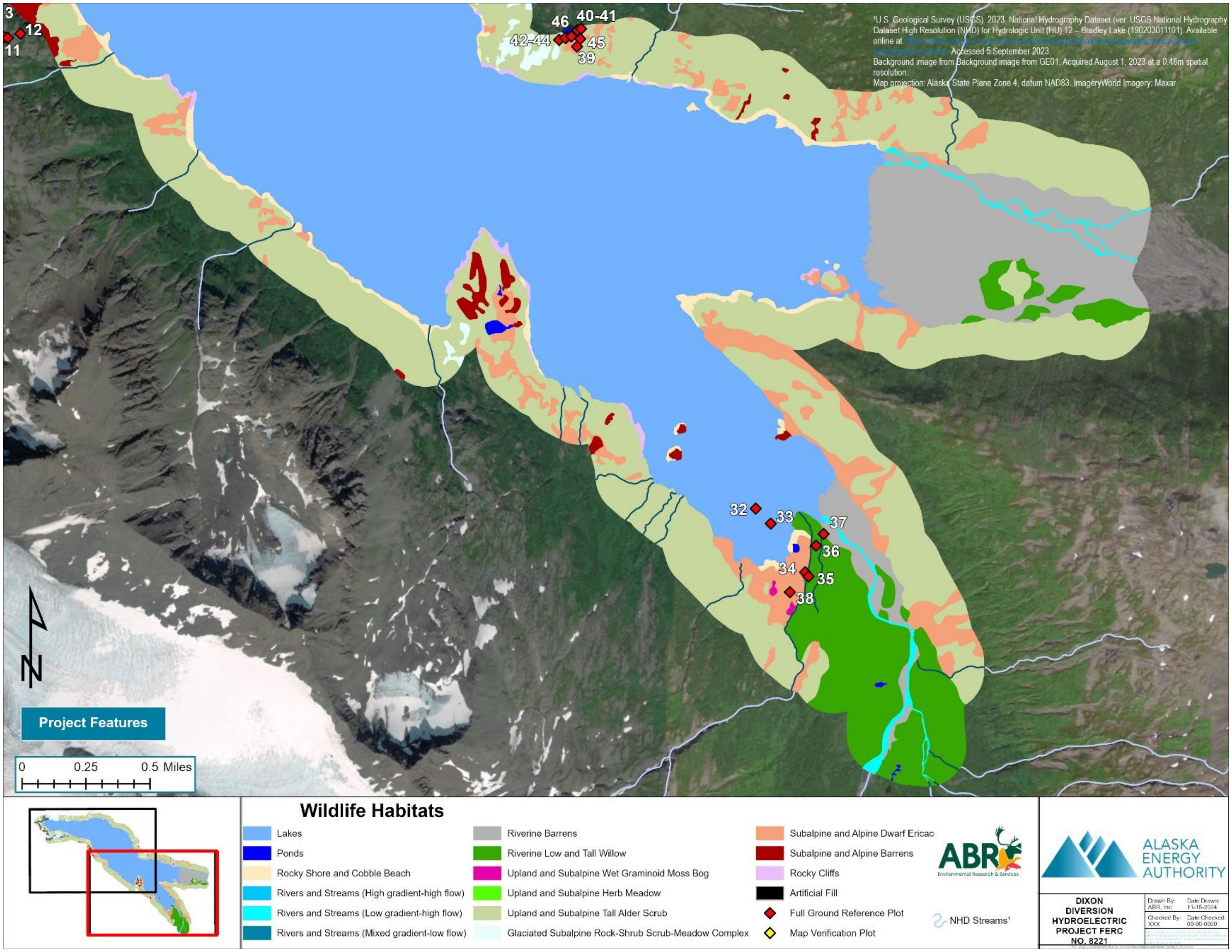


Figure 5-3 Wildlife Habitat Types within the 2024 Vegetation and Wildlife Habitat Mapping Study Area, East.

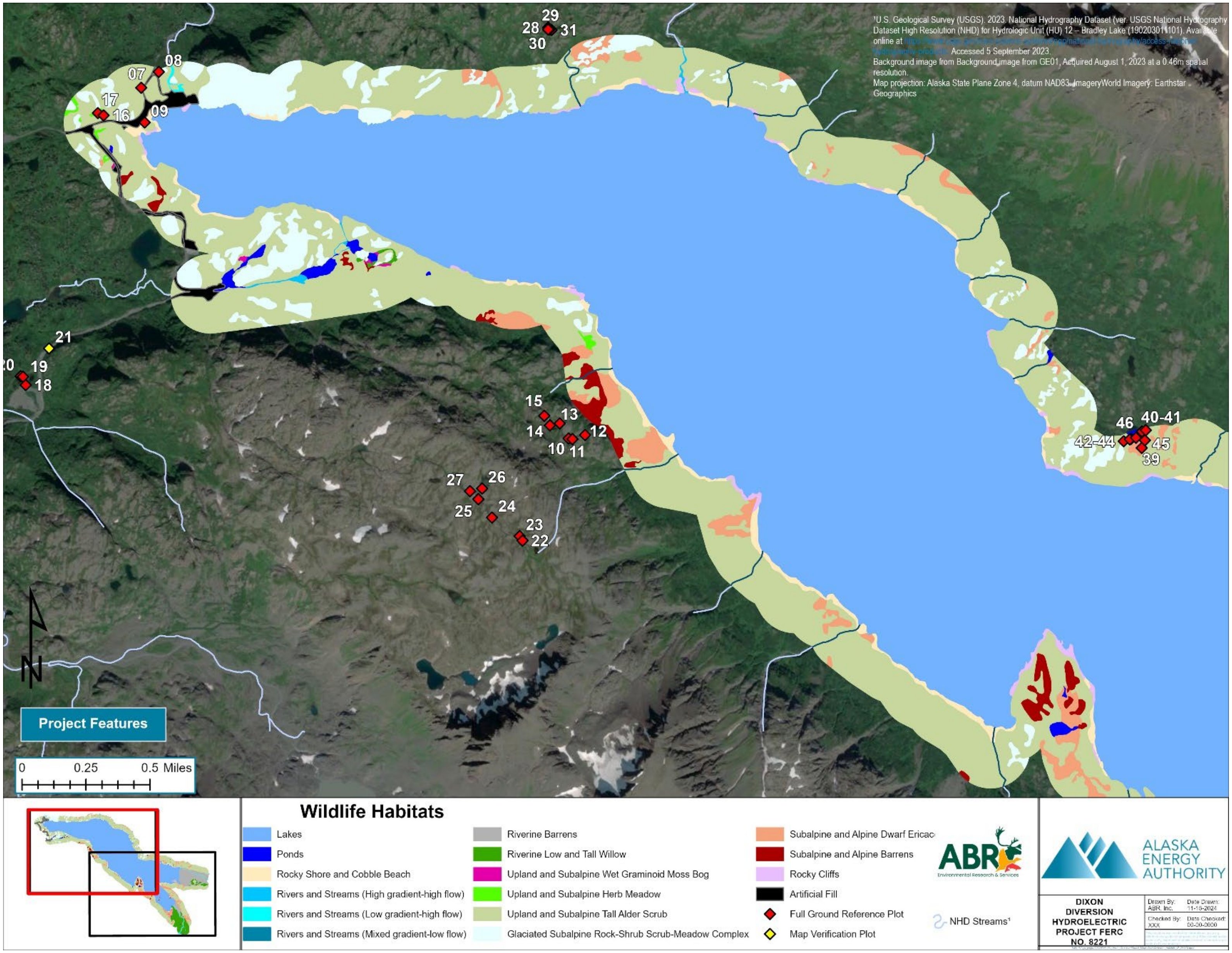


Figure 5-4 Wildlife Habitat Types within the 2024 Vegetation and Wildlife Habitat Mapping Study Area, West.

6.0 DISCUSSION

Vegetation and wildlife habitat maps were prepared for the 2024 study area and summarized in the results section above. A reconnaissance field survey was completed which includes ground reference data for the 2024 study area and for future wildlife habitat mapping areas. Data collected in 2024 can be used to support the expanded mapping areas and habitat change analyses as described above without additional field surveys to meet the goals and objectives of the Final Study Plan and additional agency requests.

7.0 STUDY STATUS AND SCHEDULE

AEA will complete the *Vegetation and Wildlife Habitat Mapping Study* as described above in 2025 and provide a comprehensive report summarizing study activities for both the 2024 and 2025 study seasons.

8.0 REFERENCES

Alaska Power Authority. 1984. Before the Federal Energy Regulatory Commission Application for License for Major Unconstructed Project Bradley Lake Hydroelectric Project. FERC Project No. P-8221-000. Volume 2 Exhibit E, Chapters 1-3.

Federal Energy Regulatory Commission (FERC). 1985. Final Supplemental Environmental Impact Statement. Bradley Lake Project – FERC No. 8221 Alaska. October 1985. Washington, D.C. 243 pp.

Jorgenson, M.T., J.E. Roth, S.F. Schlentner, E.R. Pullman, and M.J. Macander. 2003. An Ecological Land Survey for Fort Richardson, Alaska. Technical Report ERDC/CRREL TR-03-19. U.S. Army Corps of Engineers, Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH. 100 pp.

Kleinschmidt Associates. 2022a. Initial Consultation Document. Amendment to Bradley Lake Hydroelectric Project (FERC No. 8221), Proposed Dixon Diversion. Prepared for the Alaska Energy Authority. April 27, 2022.

Kleinschmidt Associates. 2022b. Draft Study Plan. Amendment to Bradley Lake Hydroelectric Project (FERC No. 8221), Proposed Dixon Diversion. Prepared for the Alaska Energy Authority. November 2022.

Schick, C.T. and W.A. Davis. 2008. Wildlife habitat mapping and evaluation of habitat use by wildlife at the Stewart River Training Area, Alaska. Final report, prepared for Alaska Army National Guard, Fort Richardson, AK, by ABR, Inc., Anchorage, AK. 54 pp.

United States Army Corps of Engineers (USACE). 1982. Bradley Lake Hydroelectric Project, Alaska. Final Environmental Impact Statement. March 1982. Anchorage, Alaska. 240 pp.

Viereck, L.A., C.T. Dyrness, A.R. Batten, and K.J. Wenzlick. 1992. The Alaska vegetation classification. Gen. Tech. Rep. PNW-GTR-286. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 278 pp.

Washburn, A.L. 1973. Periglacial processes and environments. London, Edward Arnold. 320 pp. doi:10.3189/S0022143000013654.

Wells, A.F., G.V. Frost, T. Christopherson, and E.R. Trainor. 2014. Ecological land survey and soil landscapes map for Kenai Fjords National Park, Alaska, 2013. Natural Resource Technical Report. NPS/KEFJ/NRTR—2014/921. National Park Service. Fort Collins, Colorado.

APPENDIX A

CONSULTATION RECORD

Table A-1 Consultation Summary for the Dixon Diversion Project Vegetation and Wildlife Habitat Mapping Study.

Date	Summary	Reference
March 19, 2024	Terrestrial Resources Meeting. AEA presented overview of study plans. Initiated consultation with agencies regarding list of focal wildlife species to include in the analysis and study area for habitat mapping and impact analysis.	Presentation Meeting Summary
March 28, 2024	AEA received ADF&G comments re recommendations for focal species to include in the analysis and habitat mapping extent.	ADF&G Recommendations
March 29, 2024	AEA received USFWS recommendations for additional focal species to include in the analysis.	USFWS Recommendations
April 1, 2024	AEA agreed to include the focal species proposed by ADF&G and USFWS in the wildlife habitat analysis and to habitat map the area recommended by ADF&G.	Presentation Meeting Summary

Appendix B

Full Ground Reference Plots

Sampling Point: dixon_01
Date: 2024-07-29
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Coastal
Macrotopography: Flats Margins
Viereck code: Halophytic Sedge Wet Meadow, saline
Dominant Mineral: Clayey

Notes: Plot just outside of the 2 km buffer. The rest of the access road is inaccessible due to flooding. Wet sedge marsh dominated by Carex ramenskii and Carex subspathacea.

Sampling Point: dixon_02
Date: 2024-07-29
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Coastal
Macrotopography: Flats Margins
Viereck code: Halophytic Grass Wet Meadow
Dominant Mineral: Clayey

Notes: Shallow levee next to a tidal gut. Plot dominated by Leymus mollis, with a relatively deep rooting zone alterntaing clayey and sandy layers throughout.

Sampling Point: dixon_04
Date: 2024-07-29
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Coastal
Macrotopography: Flats Margins
Viereck code: Aquatic Algae
Dominant Mineral: Not Assessed

Notes: Estuarine pond, with variable depth. Probably not flooded with salt water daily. Dried out algal mats on the edges that suggest the pond only dries out infrequently.

Sampling Point: dixon_05
Date: 2024-07-29
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Coastal
Macrotopography: Flats Margins
Viereck code: Halophytic Sedge Wet Meadow, brackish
Dominant Mineral: Clayey

Notes: Narrow band of Carex lyngbyei next to the forest. Soils with a relatively deep rooting zone and marine clays. Hydrogen sulfide odor and gleyed soil colors.

Sampling Point: dixon_06
Date: 2024-07-29
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography:
Macrotopography: Lower Slope, Convex
Viereck code: Open Tall Alder
Dominant Mineral: Loamy

Notes: Plot located 5 feet into the forest from the salt marsh, up a steep little draw. Most of the "shoreline" in this area is a rocky cliff.


Sampling Point: dixon_07
Date: 2024-07-30
Wildlife Habitat: Upland and Subalpine Tall Alder Scrub
Physiography: Upland
Macrotopography: Undulating
Viereck code: Closed Tall Alder
Dominant Mineral: Loamy

Notes: Closed alder community in a draw, located off the access road bordering a small stream. Soils consist of shallow surface organics over organic rich loam.


Sampling Point: dixon_08
Date: 2024-07-30
Wildlife Habitat: Glaciated Subalpine Rock-Shrub Scrub-Meadow Complex
Physiography: Upland
Macrotopography: Undulating
Viereck code: Open Low Alder
Dominant Mineral: Loamy

Notes: Plot located almost at the top of a rocky outcrop, representative of the habitat mosaic including bare rock, tundra, and tall shrub. Crustose lichen counted

Sampling Point: dixon_09
Date: 2024-07-30
Wildlife Habitat: Rocky Shore and Cobble Beach
Physiography: Lacustrine
Macrotopography: Human Modified
Viereck code: Barren
Dominant Mineral: Rubbly

Notes: Plot within the reservoir inundation zone. Plot is on a cobble beach with significant wrack deposits. Lake shoreline

Sampling Point: dixon_10

Date: 2024-07-30

Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area

Physiography: Upland

Macrotopography: Drainage

Viereck code: Moist Sedge Meadow Tundra

Dominant Mineral: Gravelly

Notes: An alpine forb meadow at the headwaters of a tiny stream. Soils have 4 inches of organic development above angular gravelly loam.

Sampling Point: dixon_11

Date: 2024-07-30

Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area

Physiography: Upland

Macrotopography: Lower Slope, Convex

Viereck code: Cassiope Dwarf Shrub Tundra

Dominant Mineral: Loamy

Notes: Heather meadow adjacent to the forb meadow described at plot 10 on a convex ridge.

Sampling Point: dixon_12
Date: 2024-07-30
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Upland
Macrotopography: Drainage
Viereck code: Closed Tall Alder
Dominant Mineral: Rubbly

Notes: Closed alder at the top of a draw. Plot in steep terrain extending to cliffs above the reservoir. Soils consist of a shallow rooting zone over weathered bedrock.

Sampling Point: dixon_14
Date: 2024-07-30
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Upland
Macrotopography: Hillside Headwater Depression
Viereck code: Subarctic Lowland Sedge Wet Meadow
Dominant Mineral: Rubbly

Notes: Hydrology source is a combination slope discharge and snowmelt in stream headwaters. Vegetation is patchy with exposed weathered bedrock and shallow surface water. Sheet flow present. Snowbed

Sampling Point: dixon_15
Date: 2024-07-30
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Upland
Macrotopography: Crest
Viereck code: Ericaceous-Lichen Dwarf Shrub Tundra
Dominant Mineral: Gravelly

Notes: Plot is located on a ridge top, and is partially vegetated with exposed bedrock and gravel.

Sampling Point: dixon_16
Date: 2024-07-30
Wildlife Habitat: Upland and Subalpine Herb Meadow
Physiography: Upland
Macrotopography: Lower Slope
Viereck code: Open Low Shrub
Dominant Mineral: Sandy

Notes: Site is a steep forb/grass meadow, with soils consisting of 8 inches of rooting zone organics over sandy mineral soil with lots of organics.

Sampling Point: dixon_17
Date: 2024-07-30
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Upland
Macrotopography: Crest
Viereck code: Open Lutz Spruce
Dominant Mineral: Loamy

Notes: Plot is located in a thin patch of Lutz spruce on a steep ridgeline, with thin organics over loam.


Sampling Point: dixon_18
Date: 2024-07-30
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Lowland
Macrotopography: Lower Slope
Viereck code: Closed Tall Willow
Dominant Mineral: Loamy

Notes: Site is in a willow margin to an inundated wetland, next to a laydown pad for the road construction. Soils are made up of shallow organics over loamy sand.


Sampling Point: dixon_19
Date: 2024-07-30
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Lowland
Macrotopography: Basins Or Depressions
Viereck code: Subarctic Lowland Sedge Wet Meadow
Dominant Mineral: Loamy

Notes: Plot located in a sedge/horsetail meadow that should be more or less flooded but there is no evidence of a shallow water table within the first 12 inches. No water in the pit and a relatively shallow organic layer.

Sampling Point: dixon_20
Date: 2024-07-30
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Lacustrine
Macrotopography: Basins Or Depressions
Viereck code: Pondlily
Dominant Mineral: Not Assessed

Notes: Nuphar (pond lily) pond adjacent to sedge meadow described by dixon_19. The pond water level appears to be 6 inches lower than normal, perhaps related to the drier than normal sedge meadow. Pond with emergents

Sampling Point: dixon_22
Date: 2024-07-31
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Upland
Macrotopography: Crest
Viereck code: Partially Vegetated
Dominant Mineral: Bouldery

Notes: Site located on a partially vegetated outcrop\ridge. No soil pit as the site is mostly exposed bedrock with patchy vegetation.


Sampling Point: dixon_23
Date: 2024-07-31
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Alpine
Macrotopography: Upper Slope, Concave
Viereck code: Cassiope Dwarf Shrub Tundra
Dominant Mineral: Loamy

Notes: Plot in a small patch of hummocks supporting Cassiope. Soils are loamy with organics mixed in to 8 inches.


Sampling Point: dixon_25
Date: 2024-07-31
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Alpine
Macrotopography: Drainage
Viereck code: Alpine Herb-Sedge, snowbed
Dominant Mineral: Loamy

Notes: A riverbank supporting a forb community. Soils consist of an organic mat over sandy and gravels very high organic content.

Sampling Point: dixon_27
Date: 2024-07-31
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Riverine
Macrotopography: Drainage
Viereck code: Open Low Willow
Dominant Mineral: Loamy

Notes: Streambank with forbs and low willow patches. Soils are shallow organics over loam with high organic content. The mineral layer is moist but not quite saturated. Water is a stream bisecting plot

Sampling Point: dixon_28
Date: 2024-07-31
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Upland
Macrotopography: Crest
Viereck code: Ericaceous-Lichen Dwarf Shrub Tundra
Dominant Mineral: Loamy

Notes: Plot located at the crest of a knoll within undulating terrain. A component of a subalpine mosaic with small patches of spruce, low shrub, dward shrub tundra, lichen tundra, and partially vegetated ground. Lichen covered stoney outcrop

Sampling Point: dixon_29
Date: 2024-07-31
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Upland
Macrotopography: Upper Slope, Convex, East-West Facing
Viereck code: Open Lutz Spruce
Dominant Mineral: Not Assessed

Notes: Plot is in a tiny band of Lutz spruce (slightly krumholtzed). Similar patches are present all throughout the undulating terrain in the subalpine south side of reservoir. Structure only. Mix of dwarf and full size Lutz spruce

Sampling Point: dixon_30
Date: 2024-07-31
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Upland
Macrotopography: Drainage
Viereck code: Closed Tall Willow
Dominant Mineral: Loamy

Notes: Site is a closed willow in a narrow draw. There is some exposed soil, indicating seasonal flooding, with no surface water at time of sampling. Willow drainage.

Sampling Point: dixon_31
Date: 2024-07-31
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Upland
Macrotopography: Upper Slope, Convex, South Facing
Viereck code: Mountain-heath Dwarf Shrub Tundra
Dominant Mineral: Loamy

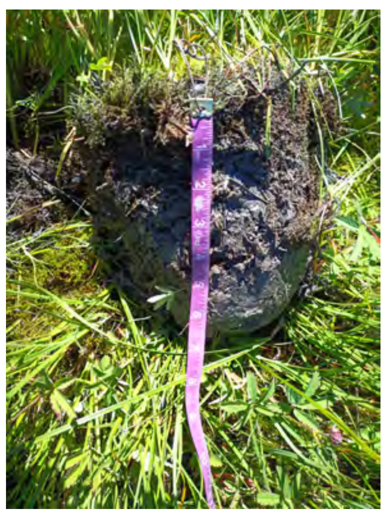
Notes: Plot is a Phylodoce meadow, within the subalpine mosaic in undulating terrain on the east side of the reservoir. The soils at this plot have a shallow rooting zone with organic rich loam.

Sampling Point: dixon_33
Date: 2024-07-31
Wildlife Habitat: Lakes
Physiography: Lacustrine
Macrotopography: Lake Margins
Viereck code: Partially Vegetated
Dominant Mineral: Clayey

Notes: Site located on an exposed terrace. This site is intermittently exposed due to fluctuations in reservoir level. Partially vegetated with Equisetum arvense and many piles of bear scat. The top 4 inches of the soil profile are bedded lacustrine clay materials underlying by sand. Heavy bear scat on plot. 20 scat piles in 50 m radius

Sampling Point: dixon_34
Date: 2024-07-31
Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area
Physiography: Lowland
Macrotopography: Flat or fluvial related
Viereck code: Subarctic Lowland Sedge Wet Meadow
Dominant Mineral: Clayey

Notes: Wet sedge meadow on the bank of a tributary to Clearwater stream. Soils are saturated to the surface, with 4 inches of organic rooting zone over gleyed silts.



Sampling Point: dixon_35
Date: 2024-07-31
Wildlife Habitat: Riverine Low and Tall Willow
Physiography: Riverine
Macrotopography: Flat or fluvial related
Viereck code: Closed Low Willow-Ericaceous Shrub
Dominant Mineral: Gravelly

Notes: Closed low willow between the glacial river and the tributary to Clearwater stream. Flooded and abandoned channels are present throughout but the vegetated surfaces are still well above the water table. The soils consist of 4 inches of rootingzone organics over rounded riverine gravels and sand. Channels running through type

Sampling Point: dixon_36
Date: 2024-07-31
Wildlife Habitat: Riverine Low and Tall Willow
Physiography: Riverine
Macrotopography: Flat or fluvial related
Viereck code: Open Low Willow
Dominant Mineral: Clayey

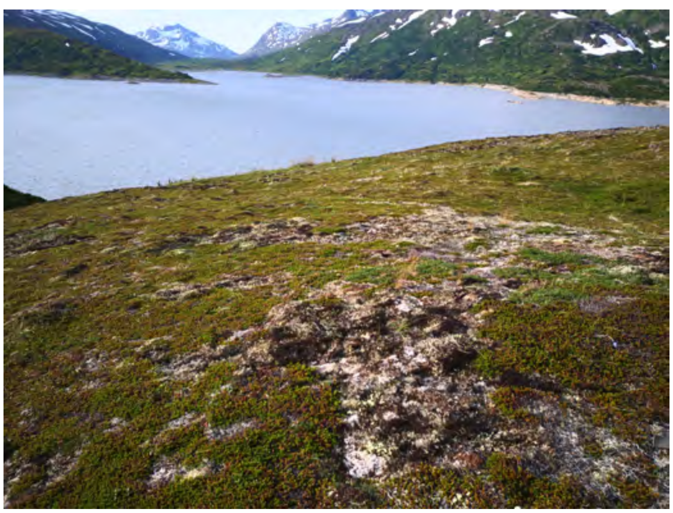
Notes: Vegetation is a graminoid meadow with an understory of low willow and some standing dead willow. Soil profile consiss of 7 inches of silt deposits over buried organics. Disturbed vegetation community resulting from wildly fluctuating reservoir levels.

Sampling Point: dixon_38
Date: 2024-07-31
Wildlife Habitat: Upland and Subalpine Tall Alder Scrub
Physiography: Upland
Macrotopography: Lower Slope
Viereck code: Closed Tall Alder
Dominant Mineral: Loamy

Notes: This plot is a tall closed alder stand, typical of lower slopes surrounding the lake.

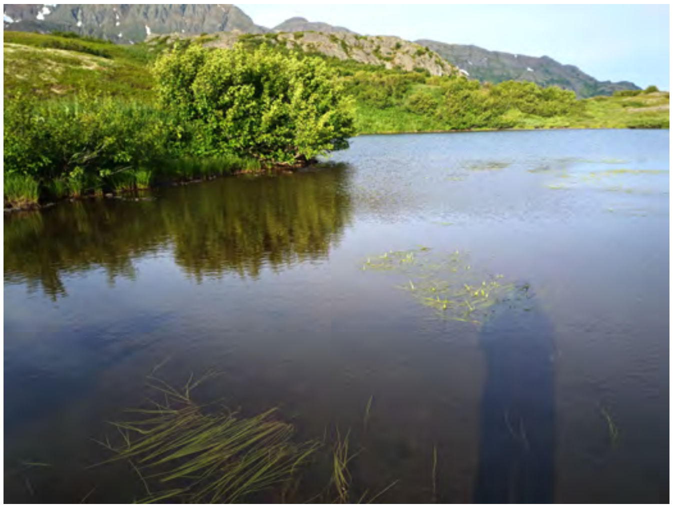
Sampling Point: dixon_39
Date: 2024-08-01
Wildlife Habitat: Subalpine and Alpine Dwarf Ericaceous Scrub
Physiography: Upland
Macrotopography: Crest
Viereck code: Crowberry Dwarf Shrub Tundra
Dominant Mineral: Gravelly

Notes: Empetrum tundra with higher cover of cladonia\cladina and stereocaulon. Soils have very little organic development over gravelly loam.



Sampling Point: dixon_40
Date: 2024-08-01
Wildlife Habitat: Ponds
Physiography: Lacustrine
Macrotopography: Waterbodies
Viereck code: Fresh Water
Dominant Mineral: Not Assessed

Notes: Small shallow subalpine pond with Potamogeton. Pond contains clear water with silty substrate.



Sampling Point: dixon_41
Date: 2024-08-01
Wildlife Habitat: Upland and Subalpine Tall Alder Scrub
Physiography: Lowland
Macrotopography: Drainage
Viereck code: Subarctic Lowland Sedge Bog Meadow
Dominant Mineral: Peat

Notes: Wet sedge and moss bog meadow next to a small stream flowing into shallow pond. Soils are a histosol but are dryer than typical. Water table is not present within the top 12 inches.

Sampling Point: dixon_42
Date: 2024-08-01
Wildlife Habitat: Upland and Subalpine Tall Alder Scrub
Physiography: Upland
Macrotopography: Lower Slope
Viereck code: Closed Tall Alder
Dominant Mineral: Loamy

Notes: Tall closed alder shrub, with shallow leaf litter duff over black loam.

Sampling Point: dixon_43
Date: 2024-08-01
Wildlife Habitat: Upland and Subalpine Tall Alder Scrub
Physiography: Upland
Macrotopography: Lower Slope
Viereck code: Moist Grass-Herb Meadow Tundra
Dominant Mineral: Loamy

Notes: Plot is a grass forb meadow on a steep north facing slope. Soils are a shallow organic layer over a layer of loam with a high organic content, over mineral soil composed of sands and angular gravel. This type is a bright green photo signature . Steep sloped.

Sampling Point: dixon_44
Date: 2024-08-01
Wildlife Habitat: Upland and Subalpine Tall Alder Scrub
Physiography: Upland
Macrotopography: Lower Slope
Viereck code: Moist Forb Meadow
Dominant Mineral: Loamy

Notes: Mixed forb and tall shrub meadow. Open canopy at the transition from forb meadow to alder patch,. Soils with shallow organics over loam with cobbles.

Sampling Point: dixon_45
Date: 2024-08-01
Wildlife Habitat: Upland and Subalpine Tall Alder Scrub
Physiography: Upland
Macrotopography: Drainage
Viereck code: Closed Tall Willow
Dominant Mineral: Loamy

Notes: Plot describes closed tall willow stand in a drainage way. Soils consist of a shallow organic layer over high organic content loam. Deep pits throughout the closed willows, lacking surface water at the time of sampling but may be seasonally flooded. Dense willow in old drainage feature

Sampling Point: dixon_46

Date: 2024-08-01

Wildlife Habitat: Subalpine and Alpine Dwarf Ericaceous Scrub

Physiography: Upland

Macrotopography: Lower Slope, North Facing

Viereck code: Vaccinium Dwarf Shrub Tundra

Dominant Mineral: Loamy

Notes: Dwarf shrub Empetrum tundra with very low lichen percent cover. Site is on a north facing slope. Soils with 4 inches of organic soils over dark colored loam over gravel. This type typically occurs in small distinct patches but is possibly too small to map.

APPENDIX C

VERIFICATION PLOTS

Sampling Point: dixon_21

Date: 2024-07-30

Wildlife Habitat: Plot not located in the 2024 Wildlife Habitat Study Area

Physiography: Upland

Macrotopography: Undifferentiated Slope

Viereck code: Not Available

Notes: Plot is a verification point describing the mid-elevation forested landscape. Steep sided hills, forested summits with a meadow\tall shrub mosaic.