Dixon Diversion Project

Terrestrial Resources Meeting

January 30, 2025

ALASKA ENERGY AUTHORITY

Kleinschmidt

ABR Environmental Research & Services

DOWL

Meeting Goals

- **Project Overview**
- **Terrestrial Studies Update**
  - Wetland Delineation
  - Vegetation and Wildlife Habitat Mapping
  - Wildlife Habitat Evaluation
  - Raptor Nesting and Migration
- **Next Steps**
- **FERC Process Update**

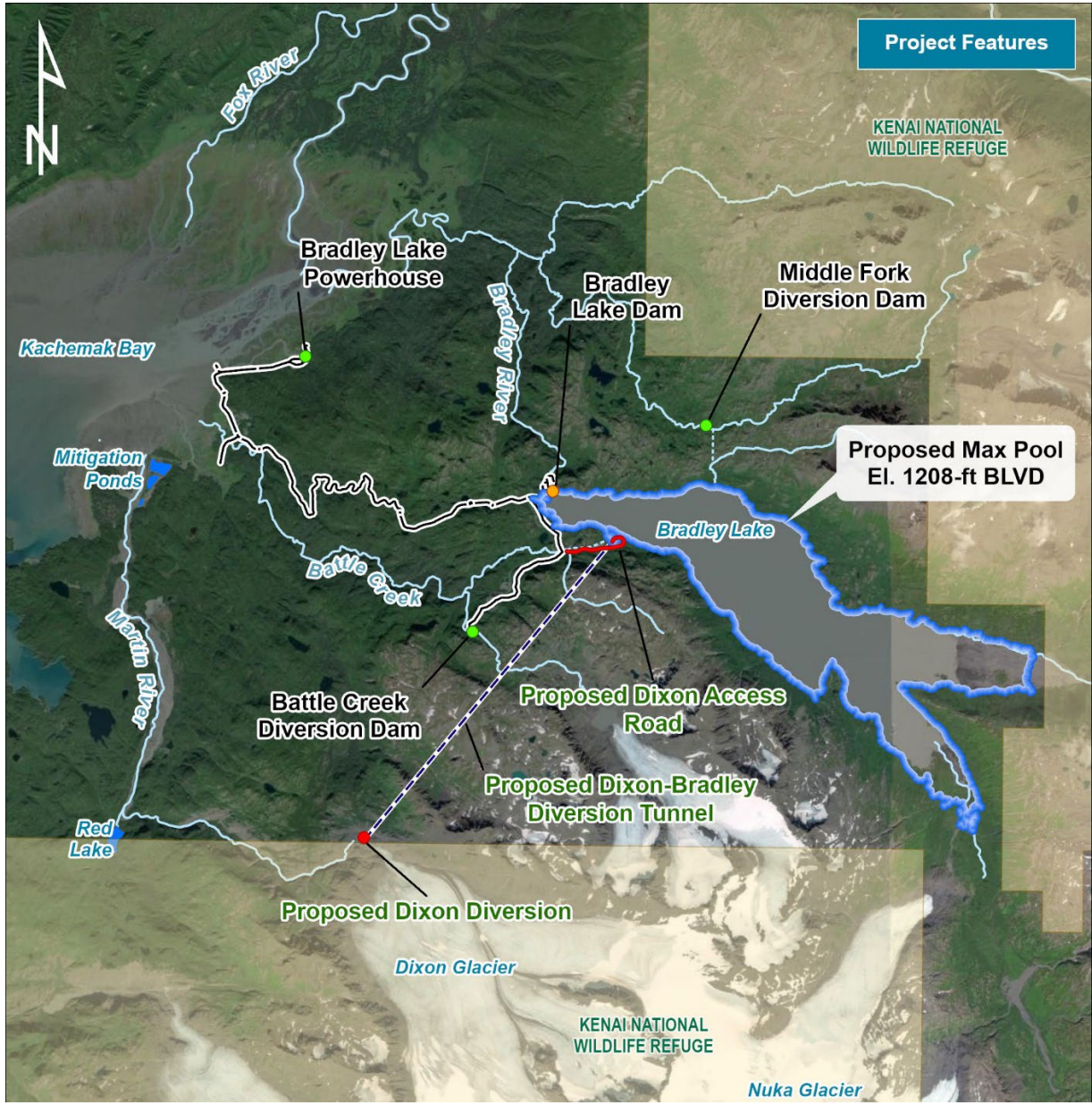
Current Project Overview

Divert glacial meltwater from Dixon Glacier to Bradley Lake May - October to increase energy output at Bradley Lake Project by 50%.

All on State-owned Land

Project Elements:

- Raise Bradley Dam & Lake by 7, 14, or 28 ft
- New diversion dam at Dixon Glacier toe
- New subsurface diversion tunnel to Bradley Lake with a maximum capacity of 1,400 cfs
- New 1-mile-long access road from existing Battle Creek Diversion road to tunnel outlet



Wetlands Study

- DOWL:
  Josh Grabel

Agenda

- Overview of 2024 Wetland Delineation
- Current project impacts
- Planned 2025 work
- Protection, mitigation, and enhancement measures
- Discussion

2024 Wetland Delineation

- Goals
  - Identify wetland and waterbody extents
- Objectives
  - Delineate wetlands in areas subject to Section 404 permit
  - Identify wetlands to be avoided or to minimize impacts
  - Identify potential areas for mitigation

Study Area

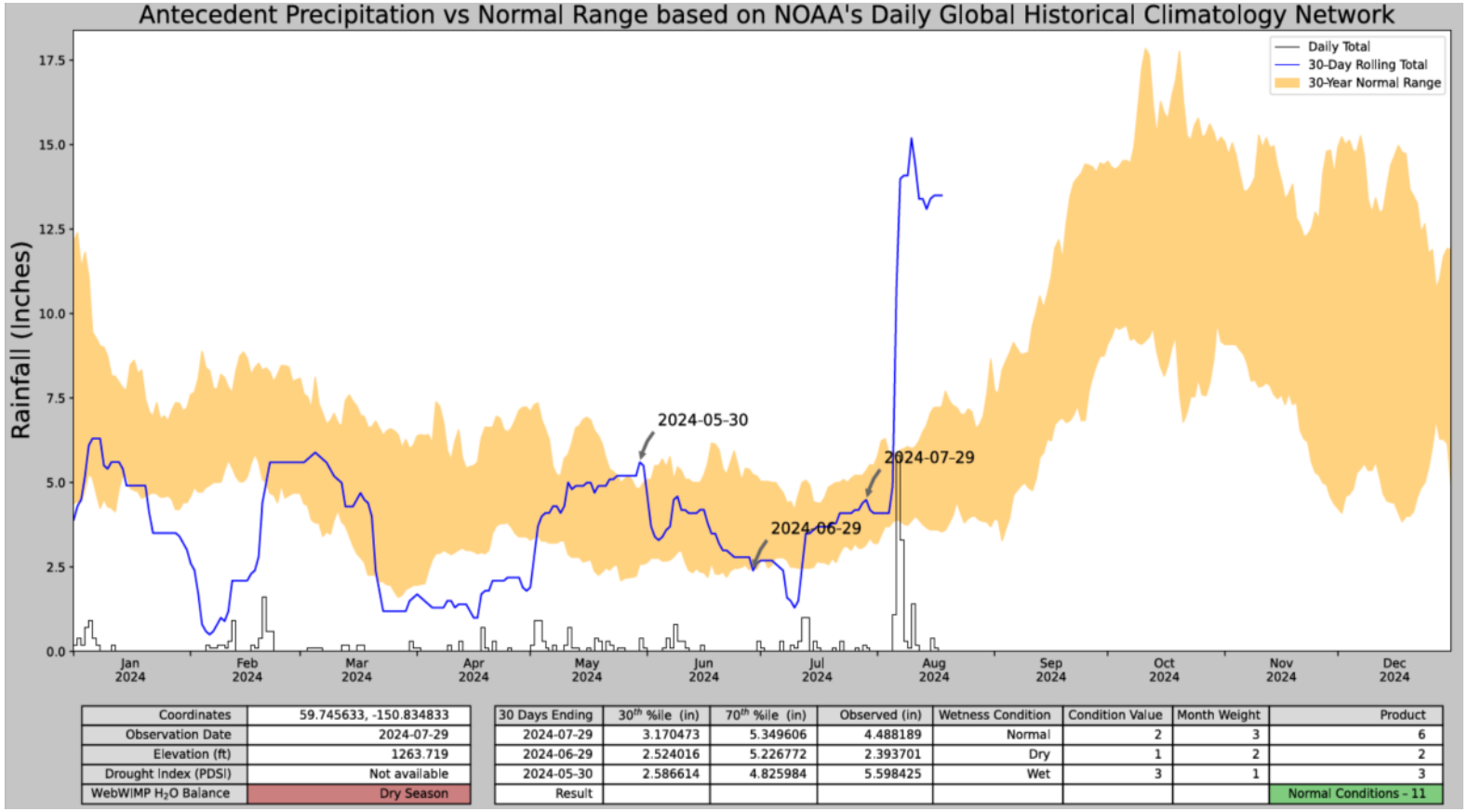
- 80-ft buffer around new access road centerline
- 100-ft buffer around tunnel inlet and outlet
- 250-ft buffer around Bradley Dam
- The area between elevations 1,180 and 1,208 ft around Bradley Lake plus 250-ft buffer
- **The study area was 456.4 acres**

Methods

- USACE Pre-application Meeting
- Started with preliminary vegetation map and LiDAR
- Ground-truthed preliminary map
- Delineated areas subject to Section 404 permit - soil, vegetation, and hydrology
- Finalized wetland and waterbody boundaries map

Fieldwork Precipitation Conditions

- Fieldwork was conducted July 29 to August 2, 2024, during the dry season for the region.
- Normal conditions for precipitation during fieldwork.

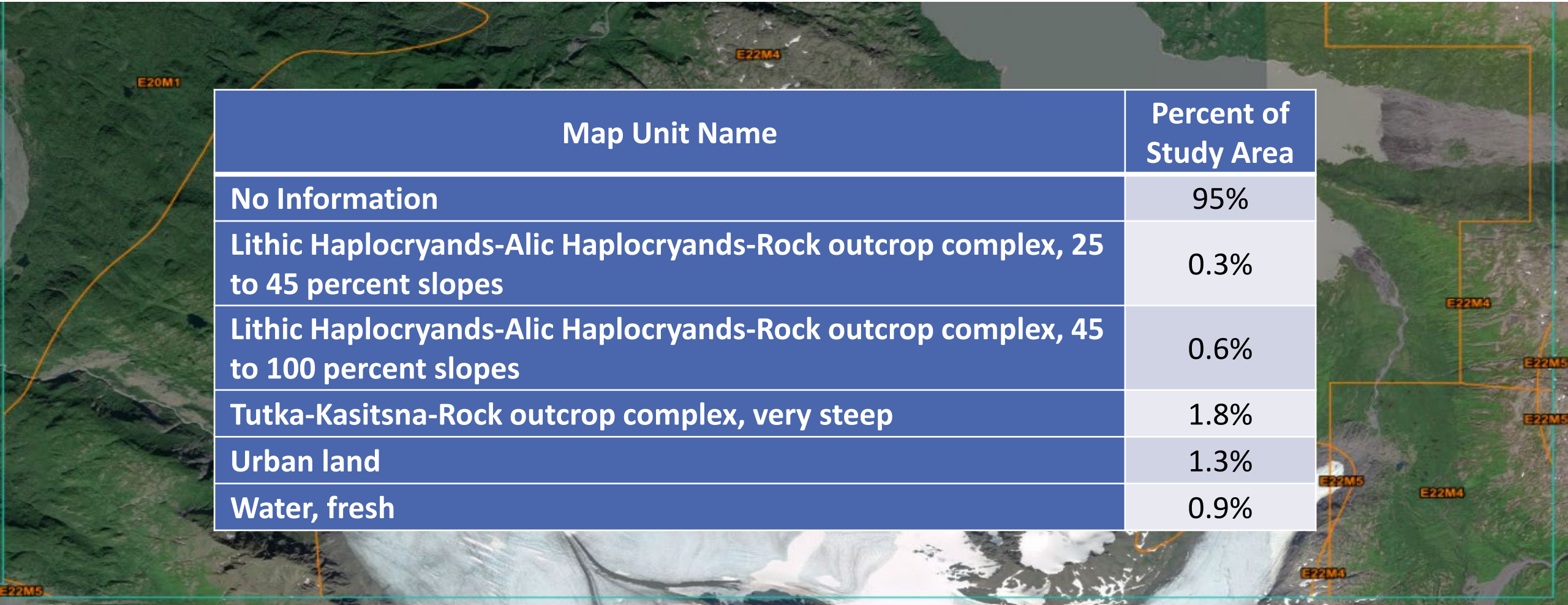


Coordinates	59.745633, -150.834833
Observation Date	2024-07-29
Elevation (ft)	1263.719
Drought Index (PDSI)	Not available
WebWIMP H_2O Balance	Dry Season

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

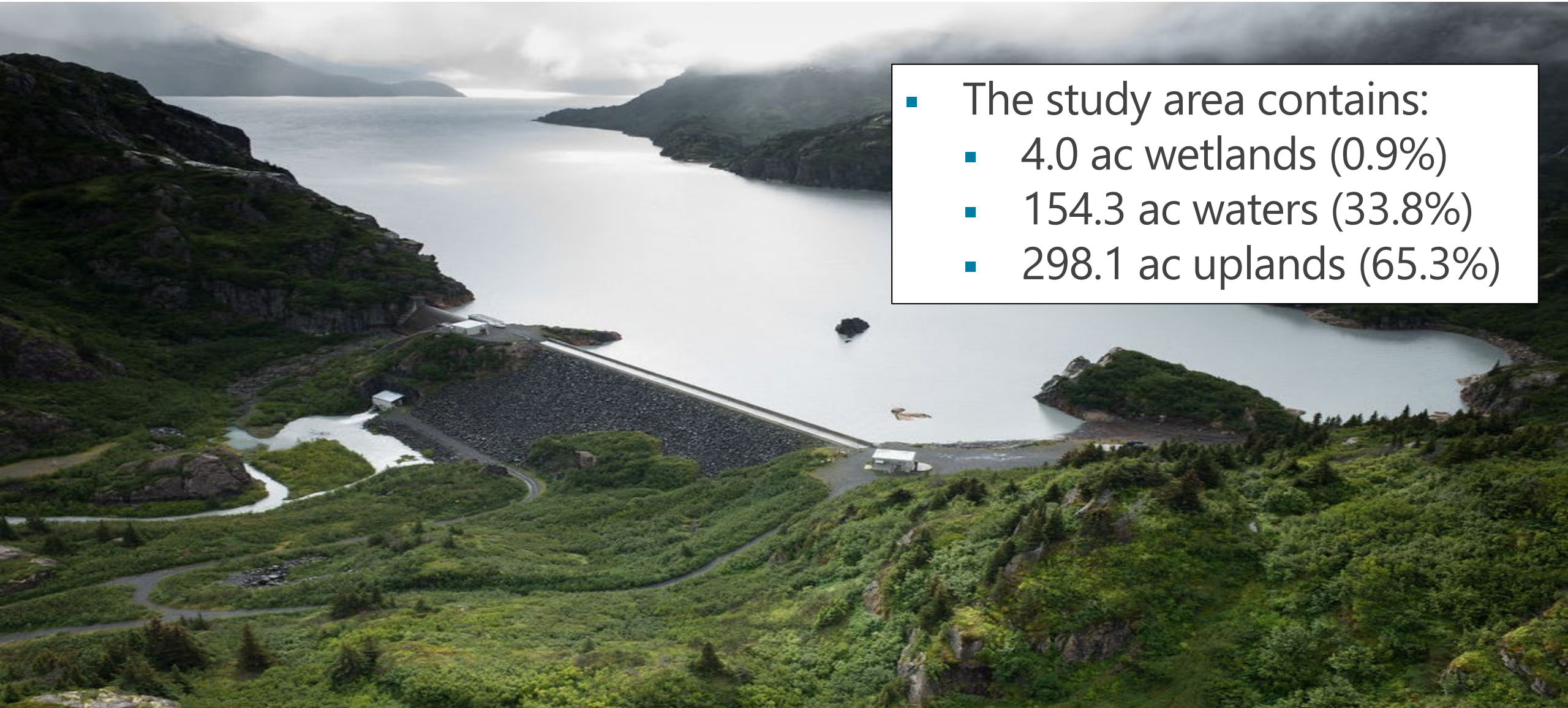
Natural Resources Conservation Service Soil Types in Study Area

ALASKA ENERGY AUTHORITY



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%

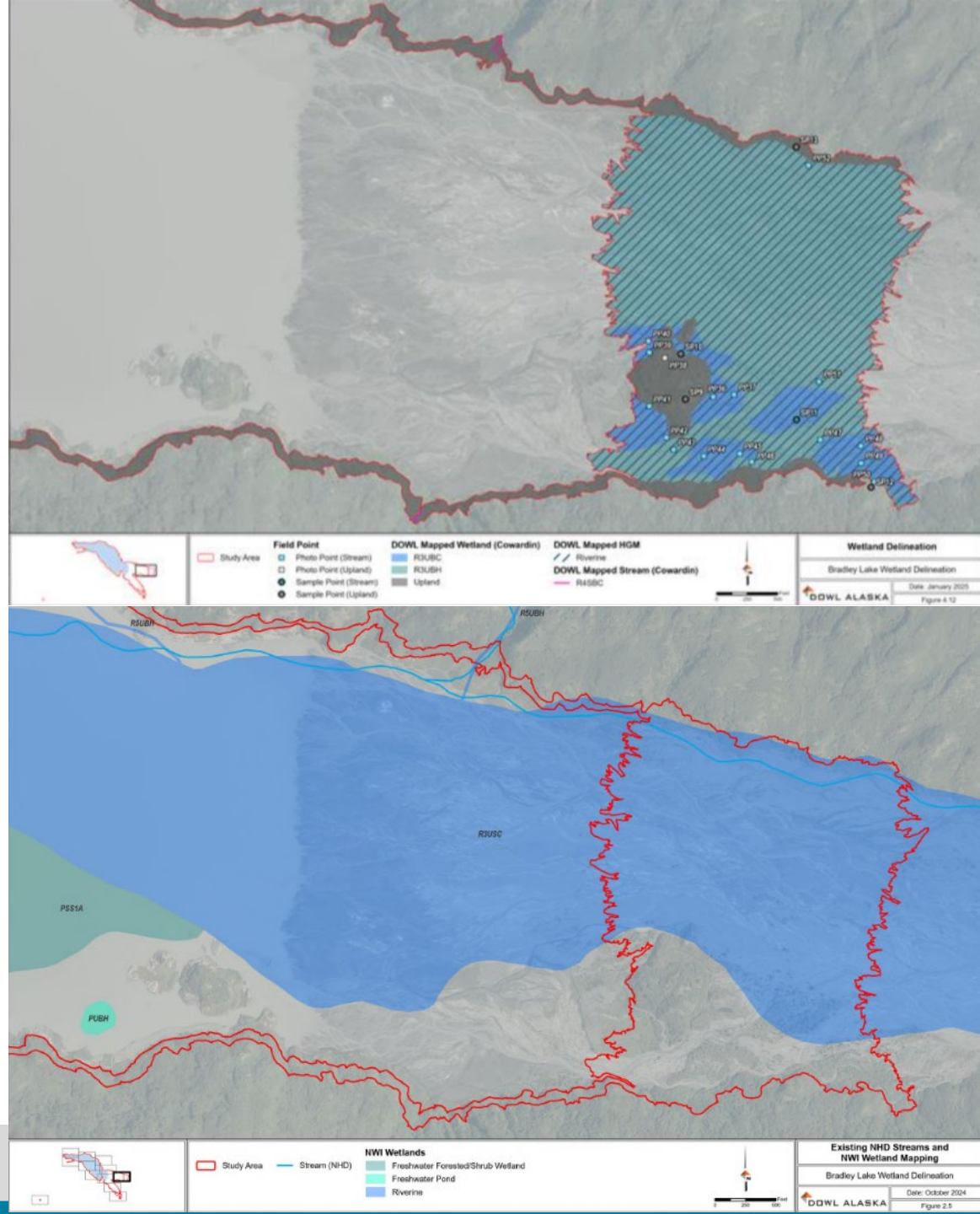
Results



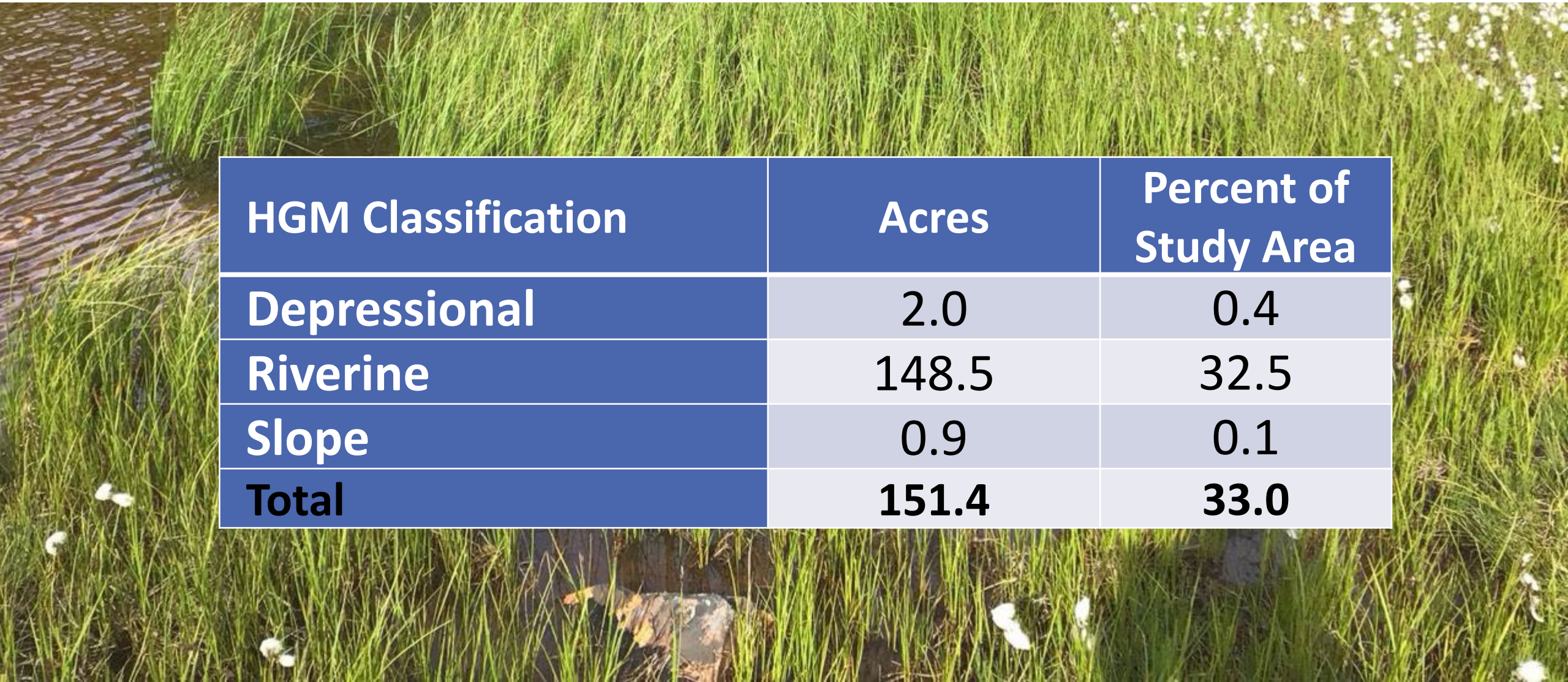
- The study area contains:
  - 4.0 ac wetlands (0.9%)
  - 154.3 ac waters (33.8%)
  - 298.1 ac uplands (65.3%)

Comparison of Results and NWI

	DOWL Mapping Data		NWI Data	
Cowardin	Acres	% Study Area	Acres	% 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**	**119.5**	**26.3**



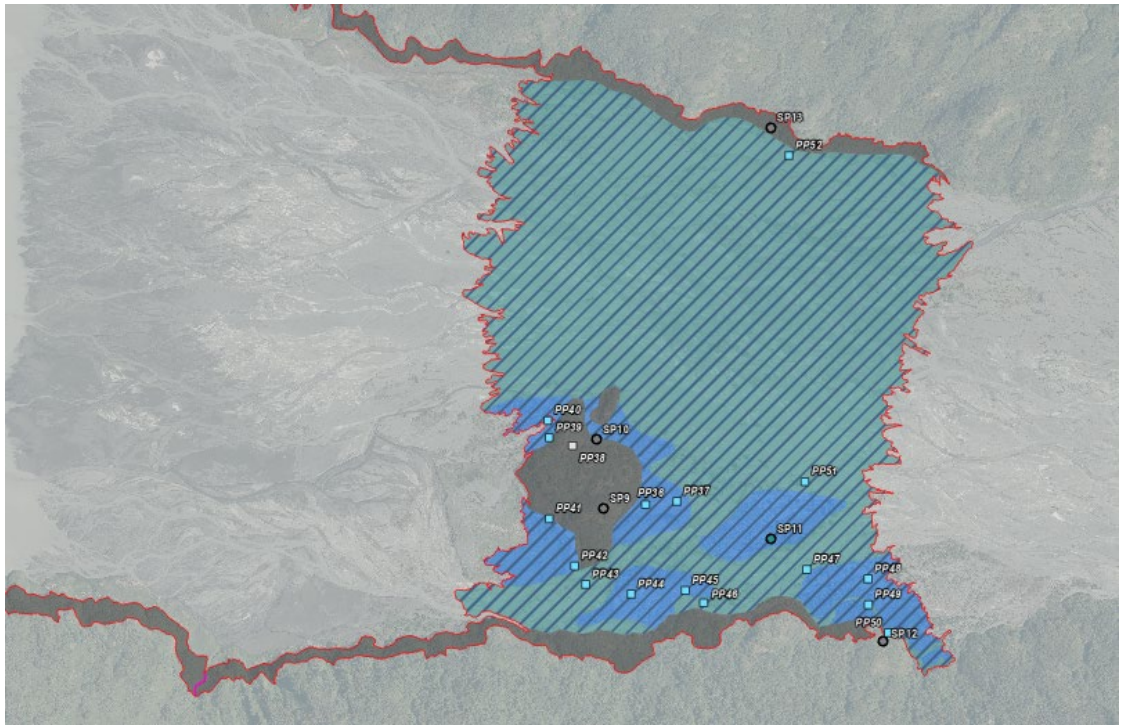
HGM Classifications in Study Area



HGM Classification	Acres	Percent of Study Area
Depressional	2.0	0.4
Riverine	148.5	32.5
Slope	0.9	0.1
Total	**151.4**	**33.0**

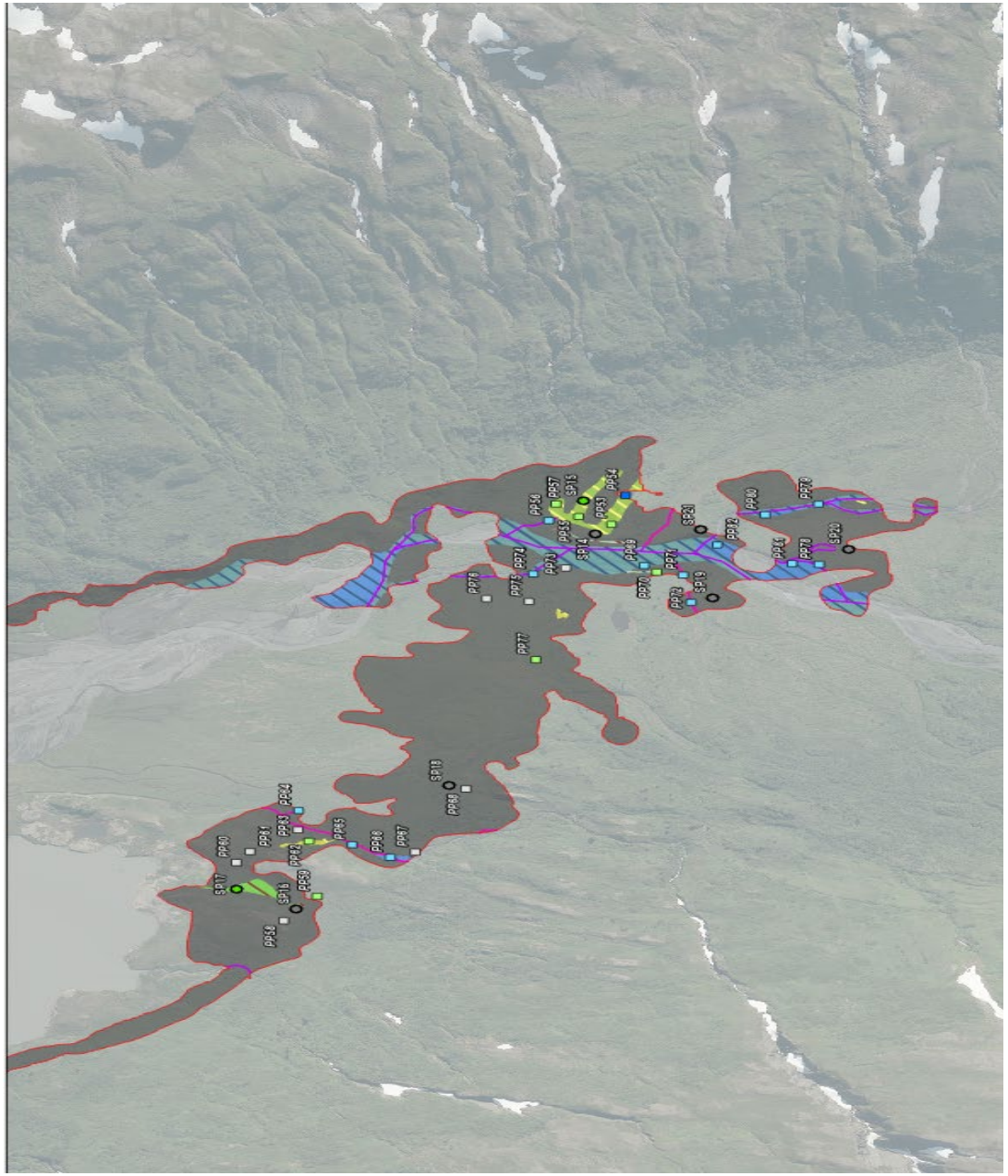
Wetland Mapping

- Kachemak Creek channels feeding Bradley Lake
- Braided stream
- Island of higher elevation



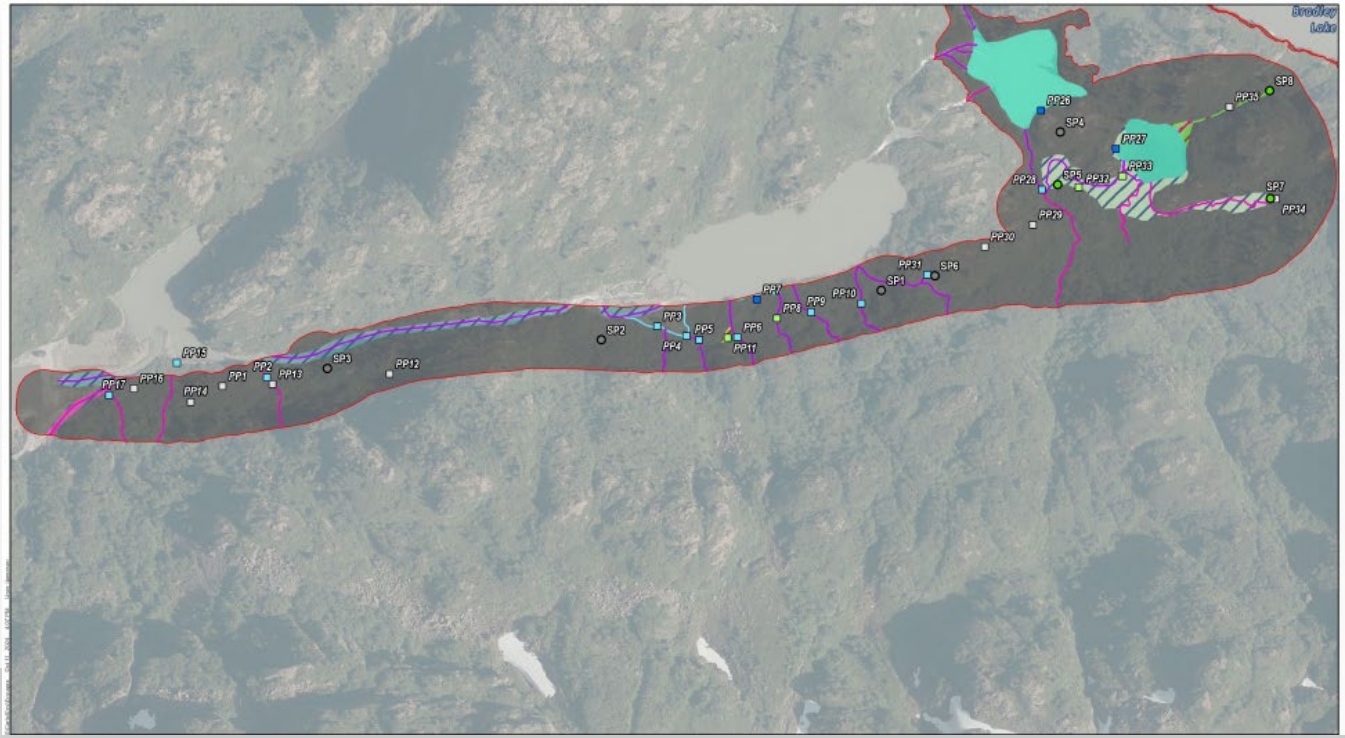
Wetland Mapping

- Nuka Glacier feeding Bradley Lake
- Well drained gravels on side slopes



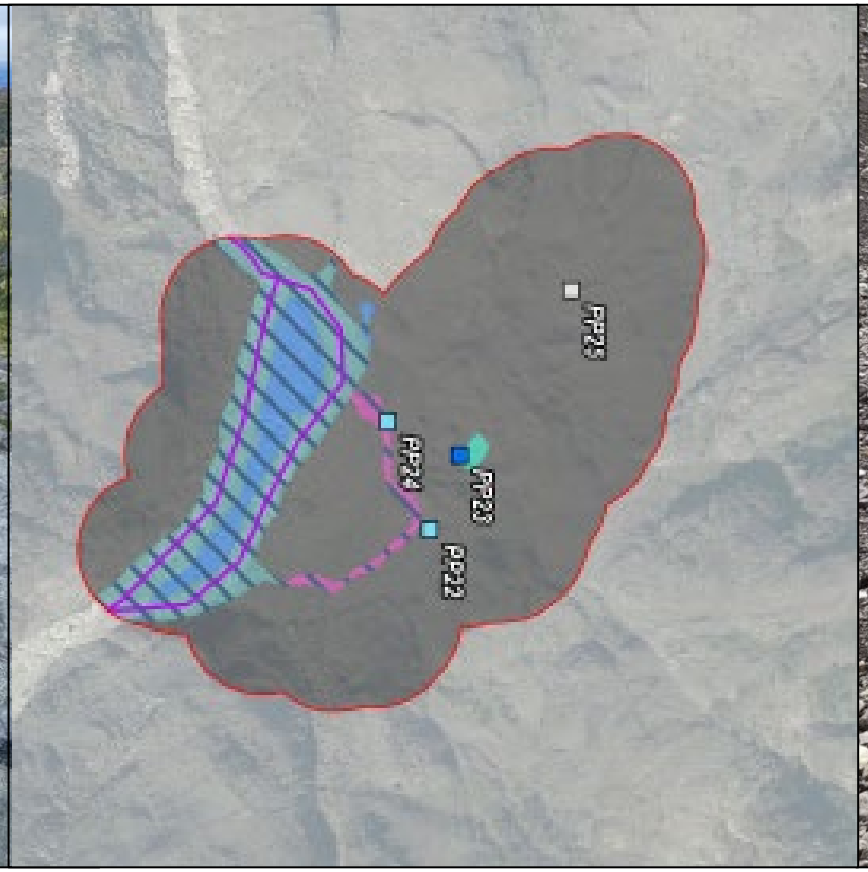
Wetland Mapping

- New Access Road and Tunnel Outlet
- Steep side slopes
- Wetlands and streams feeding ponds



Wetland Mapping

- Dixon Diversion Dam and Tunnel Intake



Wetland Mapping

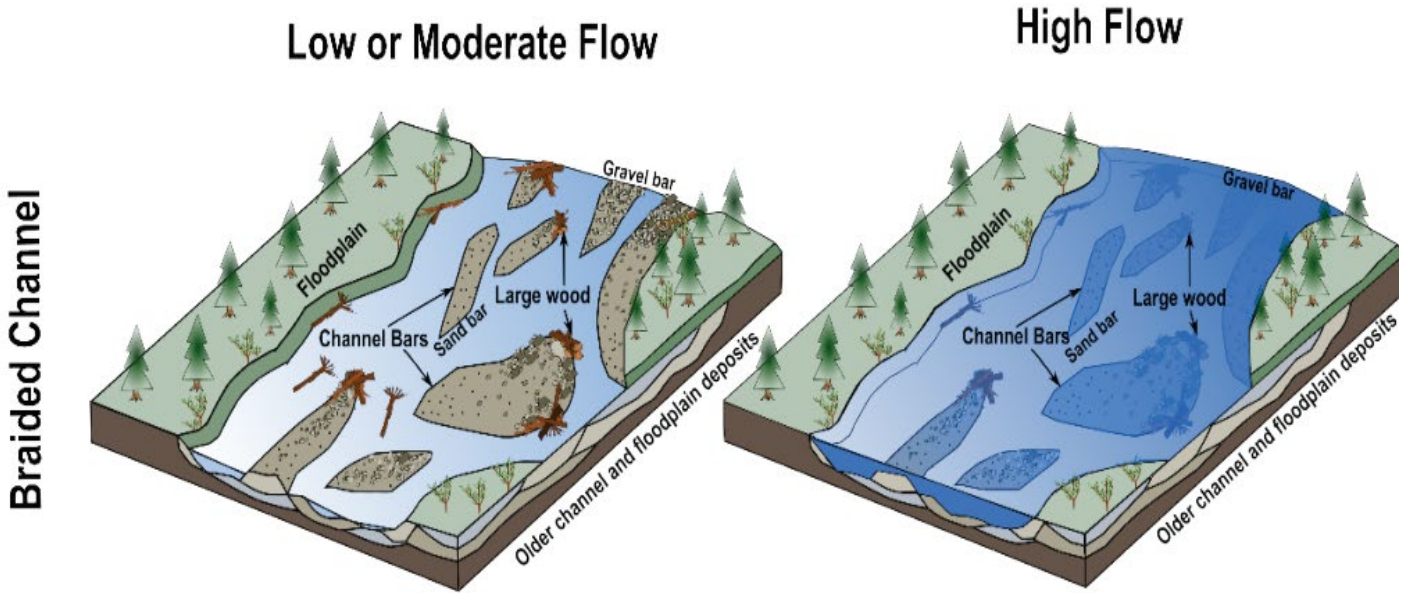
- Bradley Lake Dam Area

Typical Wetlands within Study Area

- Hydrophytic Vegetation
- Thick Organics
- Saturation + Water Table

Typical Streams within Study Area

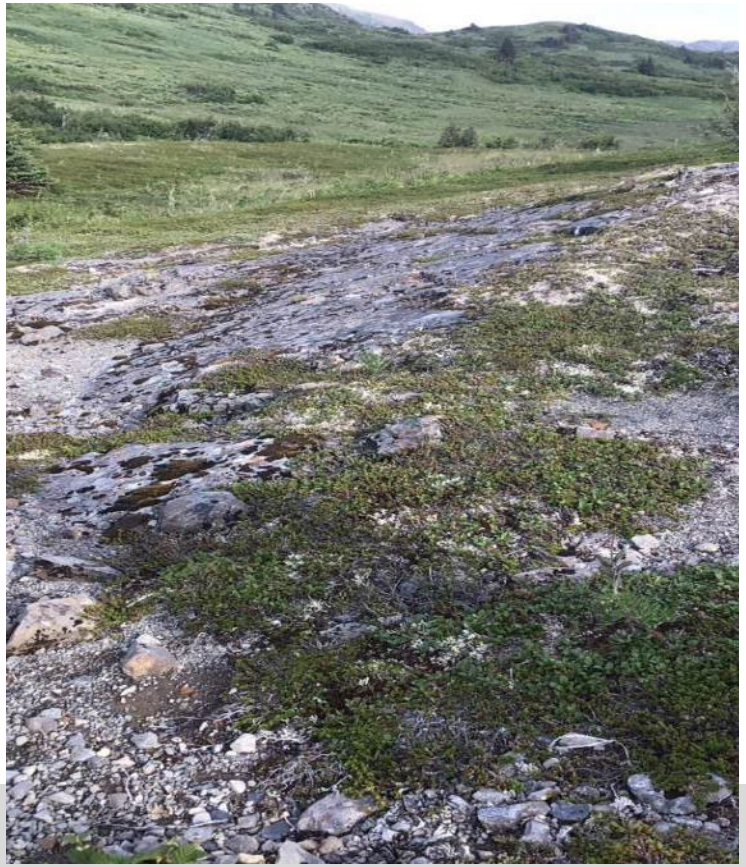
- Large braided streams
- Small alpine streams



Suazo-Davila et al. 2013

Typical Uplands within Study Area

- Facultative Vegetation
- Thin Organics
- No hydrology/well drained



Project Impacts

- **<0.1-acre wetlands** (PEM1C, PSS1B, PSS1C, and PUBH) for permanent fill material placement
- **~1,310 linear feet** of temporary stream impacts for fill material placement
- **Nationwide Permit**
  - 17, 58, RGP 7, or IP
- Highest lake elevation rise would convert 155 acres of stream into lacustrine habitat

Schedule

- **2024**
  - Wetland Delineation Complete
- **2025**
  - USACE Wetland Delineation Concurrence
  - Functional Assessment
  - Develop protection, mitigation, and enhancement (PME) measures
  - FERC Amendment Application- Environmental Assessment

Bradley Camp Tidal Flats

Example PME Measures

- Maintain natural drainage patterns.
- Stake and/or flag boundaries of wetlands and waters with buffers to prevent encroachment.
- Comply with Alaska Pollution Discharge Elimination System Permit (APDES).
- Comply with FEMA requirements for fills within 100-year floodplains
- Develop and implement approved Fuel and Hazardous Substances Plan (e.g., Battle Creek Amendment Article 62)
  - Fuel storage tanks shall be located above the 100-year flood level.
  - Material must be onsite to contain and clean up spills and leaks.

Example PME Measures

- Develop and implement approved Erosion and Sediment Control Plan (e.g., Battle Creek Amendment Article 61)
  - Prohibit fueling and stockpiling of construction wastes within the areas.
  - Prohibit heavy equipment operation in wetlands outside authorized excavation/fill area.
  - No fill or construction materials shall be stockpiled in wetlands.
  - Manage temporary storage of excavated material to prevent sedimentation to adjacent wetlands and waters.
  - Deploy and install erosion control measures prior to construction
  - Stabilize all exposed fills (including side slopes) and disturbed areas after construction.
  - Re-vegetate as soon as site conditions allow with native species.

Discussion

- Delineation adequate to assess baseline and potential impacts?
- Any additional data collection needs for the 2025 field season?
- Functional assessment will use wetland delineation data and Alaska Wetland Assessment Methodology/HGM. Thoughts?

Vegetation and Wildlife Habitat Change Study

- ABR, Inc.—Environmental Research & Services

- Wendy Davis
- Terry Schick

Goals & Objectives

Goal:

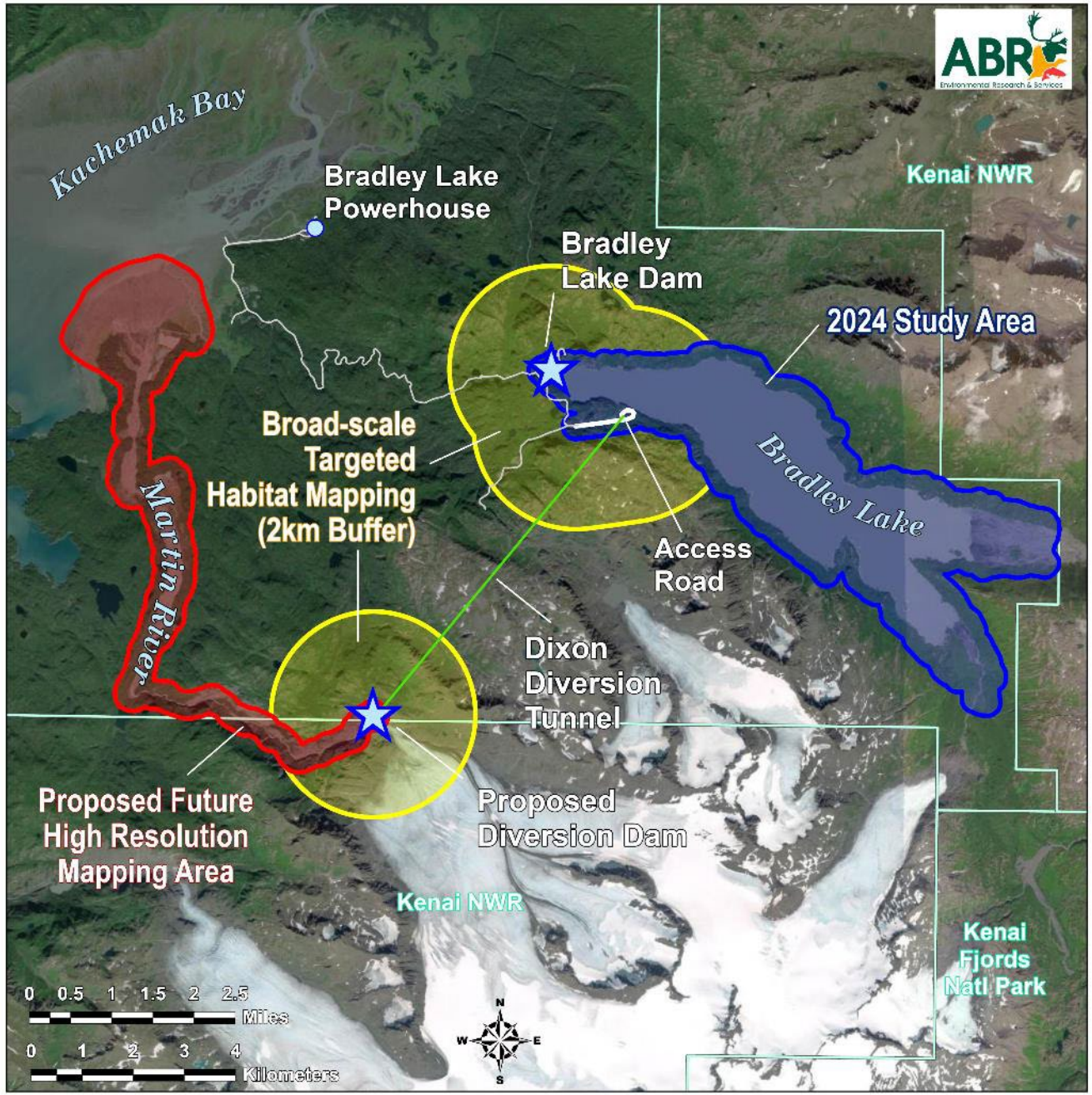
- In conjunction with the Wildlife Habitat Evaluation and Martin River Geomorphology Study, quantify potential Project impacts and future change in extent of important wildlife habitats.

Objectives:

- Identify, delineate, and map existing vegetation and wildlife habitat types in the study area.
- Prepare a vegetation and wildlife habitat map depicting expected, future, post-construction conditions.

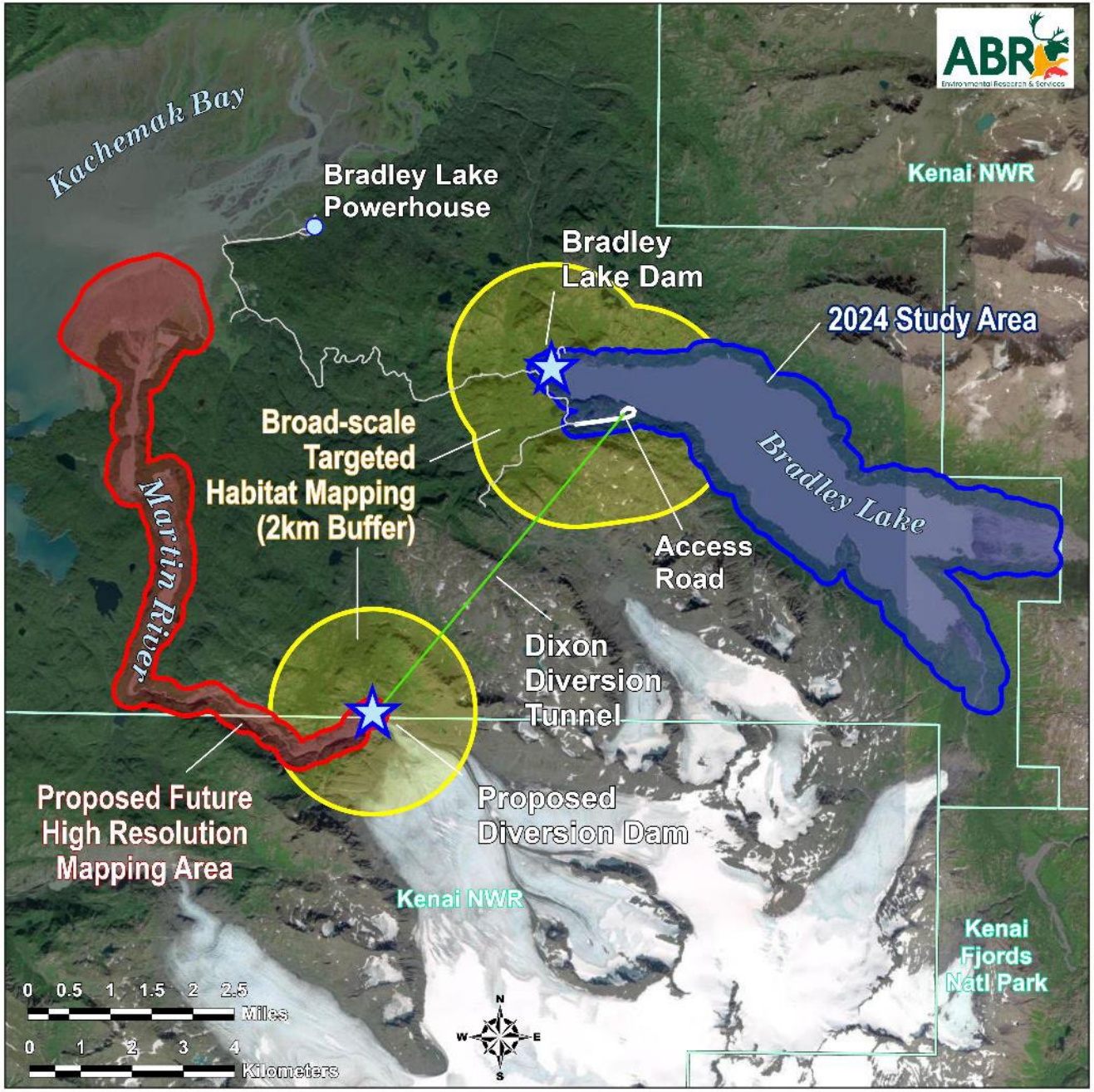
Study Area

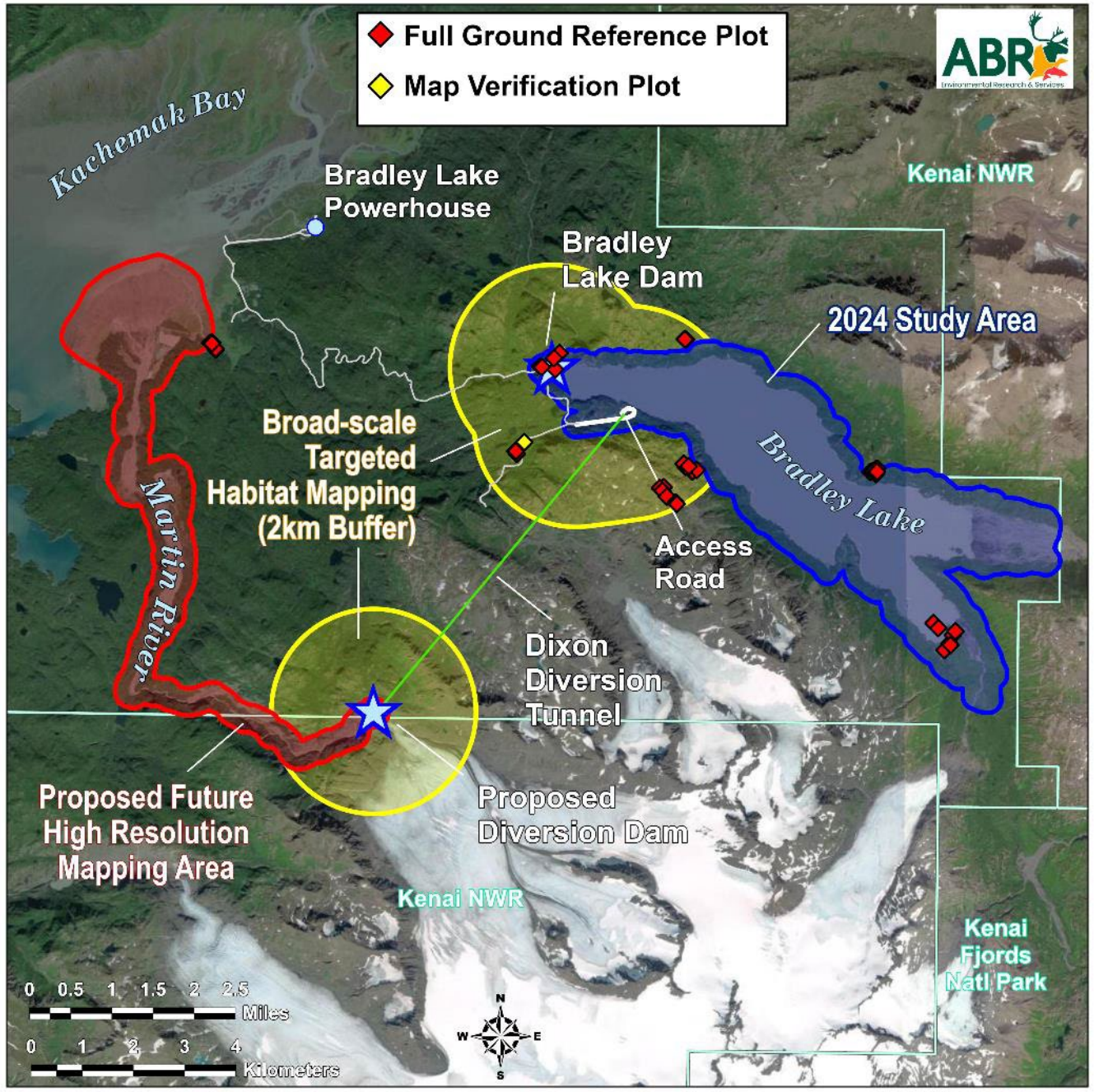
- Study area developed in collaboration with state and federal agencies to include high resolution and broad scale wildlife habitat mapping.
- **Fine scale mapping within a 250-m buffer** surrounding all proposed project elements (Bradley Lake, Bradley Lake Dam, Proposed Dixon Diversion Dam, access road, and Martin River).
- **Broadscale wildlife habitat mapping within a 2-km buffer** surrounding dam, road, tunnel inlet and outlet construction activities.



Methods

- Fine scale mapping was done using a multivariate method, deriving wildlife habitats from several mapped landscape attributes (vegetation, physiographic position, surface form, and disturbance type).
- Broad scale mapping will be done directly by wildlife habitat type and will be limited to habitats important to the list of focal mammals for the project.



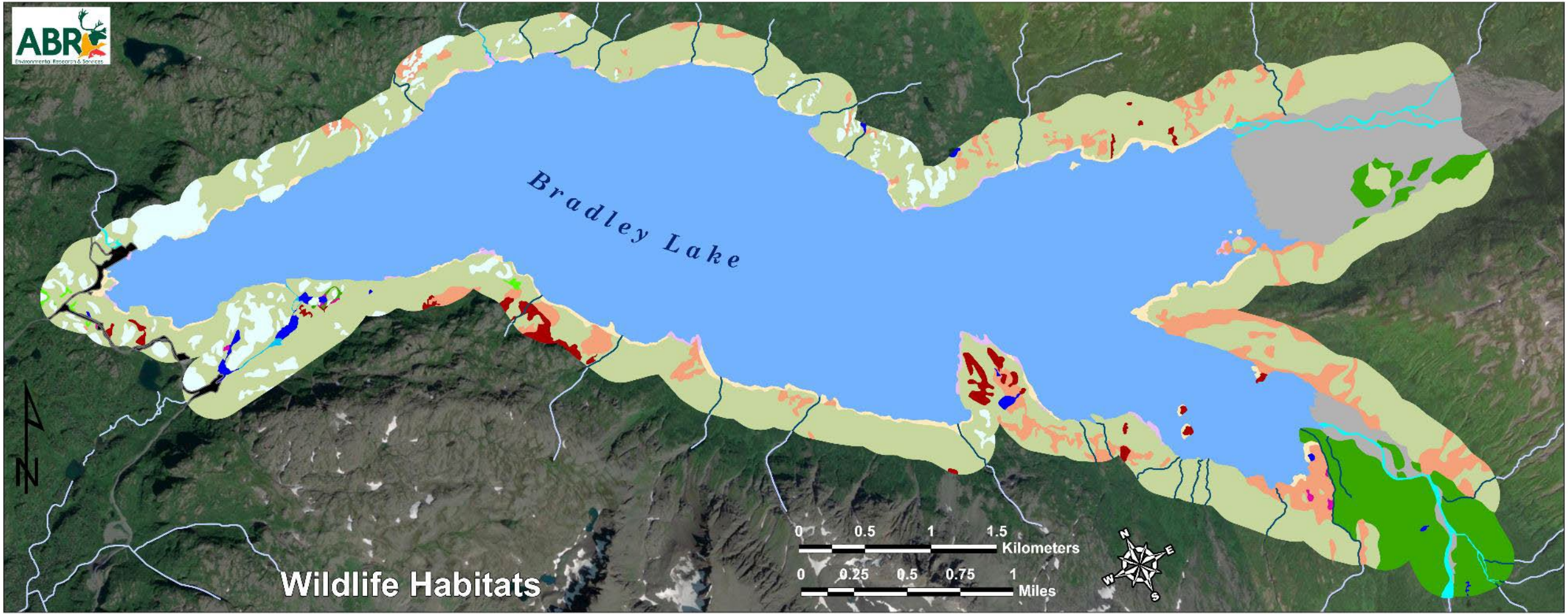


Methods

- A brief field survey conducted in July 2024 in conjunction with wetlands and cultural resources teams.
- 18 plots were sampled within the 2024 mapping area and expanded the plot information using the wetland dataset.
- 28 plots were sampled within the broad scale habitat mapping area and in the Martin River estuary for use in the 2025 mapping effort.

Methods

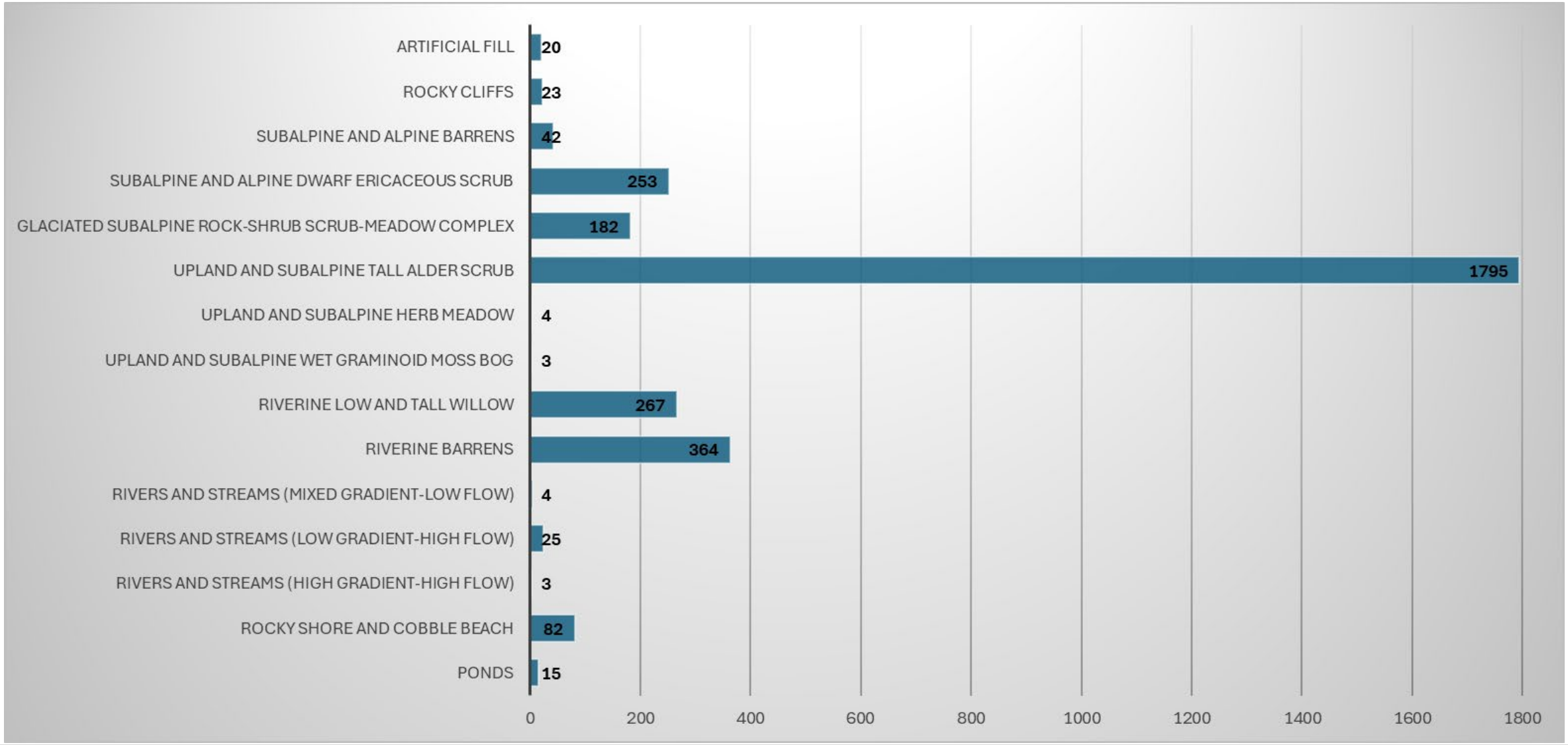
- Another brief field survey is planned for summer 2025 within the Martin River drainage and within the broadscale mapping area.
- Preliminary fine scale and broadscale mapping will be complete in spring 2025 prior to field work
- Preliminary mapping will be updated after data collection.
- Future habitat maps will be prepared in fall 2025.



[1]U.S. Geological Survey (USGS). 2023. National Hydrography Dataset (ver. USGS National Hydrography Dataset High Resolution (NHD) for Hydrologic Unit (HU) 12 – Bradley Lake (190203111101). Available online at https://www.usgs.gov/core-science-systems/ngp/national-hydrography/access-national-hydrography-products. Accessed 5 September 2023.
Background image from Background image from GE01, Acquired August 1, 2023 at a 0.46m spatial resolution. Map projection: Alaska State Plane Zone 4, datum NAD83. ImageryWorld Imagery: Earthstar Geographics

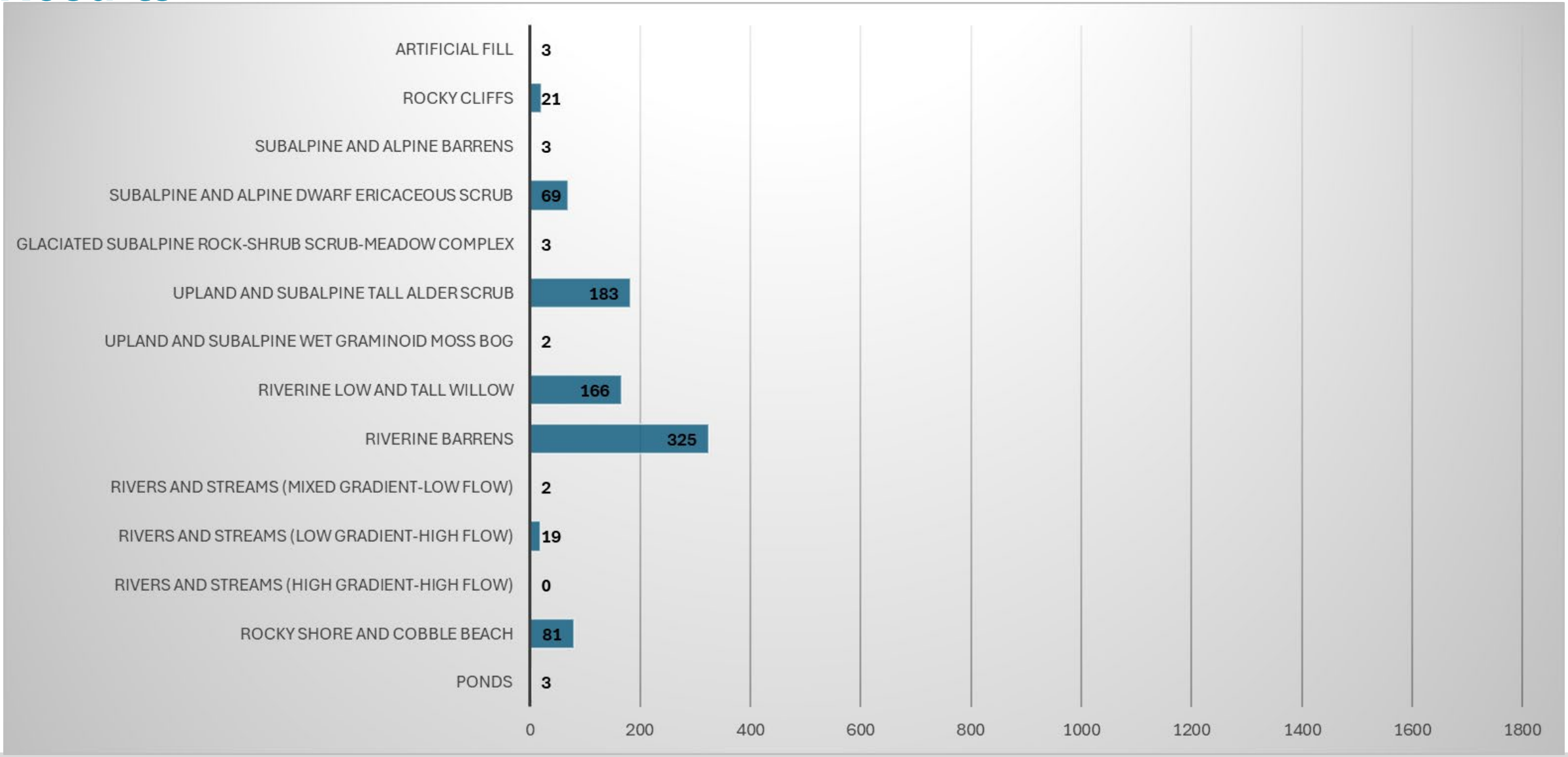
Results

Wildlife Habitats within the Fine Scale Study Area Surrounding Bradley Lake (250-m Buffer)



Results

Inundation of Habitats Below the 1,208-ft Elevation (+28-ft)



Schedule

2024 Complete

- Fine scale habitat map for the Bradley Lake area
- Field survey for Bradley Lake and portions of broadscale area
- 2024 Interim Report

2025

- Field survey for the Martin River
- Prepare current and future conditions map for Martin River and Bradley Lake areas
- Prepare broadscale wildlife habitat map
- Final Study Report

Discussion

Wildlife Habitat Evaluation

- ABR, Inc.—Environmental Research & Services

- Rebecca McGuire
- Terry Schick

Goals & Objectives

Goal:

- Assess wildlife habitat values for birds and mammals of concern to facilitate assessment of potential habitat impacts.
- Provide data for a quantitative assessment of habitat impacts for species not specifically studied in the field, and to assess habitat availability for large mammals that could be affected by blasting.

Goals & Objectives

Objectives:

- Determine local habitat associations for selected wildlife species of concern.
- Categorically rank habitat values (high, moderate, low, negligible) for each species and habitat type.
- Inform predictions of species responses to habitat changes from proposed project modifications (for license amendment application).

Species List for Analysis

- 15 mammal species

Hoary marmot [2]
American beaver
Singing vole
Tundra (root) vole [1]
Snowshoe hare
Dusky shrew
Western water shrew
Keen's myotis [2]
Little brown myotis
Black bear [2]
Brown bear [2]
River otter
Wolverine [1, 2]
Moose
Mountain goat

[1] USFWS request
[2] ADF&G request

Species List for Analysis

- 50 bird species

Northern Pintail [1]	Lesser Yellowlegs [1]	Peregrine Falcon [1]
Steller's Eider [1]	Greater Yellowlegs [1]	Rufous Hummingbird [1]
Harlequin Duck	Spotted Sandpiper	Olive-sided Flycatcher [1]
Black Scoter	Marbled Murrelet [1]	Alder Flycatcher
Long-tailed Duck [1]	Kittlitz's Murrelet	Olive-sided Flycatcher [1]
Common Goldeneye [1]	Black-legged Kittiwake [1]	Horned Lark [1]
Barrow's Goldeneye [1]	Bonaparte's Gull [1]	Bank Swallow [1]
Common Merganser	Herring Gull [1]	American Pipit [1]
Red-breasted Merganser	Arctic Tern [1]	Lapland Longspur [1]
Willow Ptarmigan	Red-throated Loon [1]	Fox Sparrow
Semipalmated Plover	Pelagic Cormorant [1]	Savannah Sparrow
Rock Ptarmigan	Golden Eagle	Song Sparrow
Rock Sandpiper [1]	Northern Harrier	Orange-crowned Warbler
Semipalmated Sandpiper [1]	Bald Eagle	Yellow Warbler
Western Sandpiper [1]	Red-tailed Hawk	Blackpoll Warbler [1]
Short-billed Dowitcher [1]	Short-eared Owl [1]	Wilson's Warbler
Wandering Tattler [1]	Belted Kingfisher	

- [1] USFWS request

Schedule

2025

- Late summer:
  rank habitats for each species for existing and future conditions following completion of the mapping
- Early winter:
  Final Study Report

Raptor Nesting Study

- ABR Inc.—Environmental Research & Services

- Joe Welch
- Alex Prichard

Goals & Objectives

Goal:

- Collect baseline data to evaluate and mitigate potential effects of Project construction and proposed Project facilities and activities on eagles and other raptors that may nest in the vicinity of the Project.
- Develop recommendations for work timing windows and avoidance areas for other Project field activities (PME measures) to prevent disturbance of known raptor nest sites.

Goals & Objectives

Objectives:

- Evaluate imagery for cliff-nesting raptor habitat, survey cliff habitats above Bradley Lake for nesting golden eagles and other cliff-nesting raptors (2-mile buffer);
- Categorize cliff quality for golden eagles using field observations.

Schedule

2025

- March: evaluate imagery for cliff-nesting raptor habitat
- Late May or early June: Aerial cliff-nesting raptor nest survey
- Fall: Final Study Report

PME Pre-construction Survey (Year TBD):

- April–June: Aerial tree- and cliff-nesting (if needed) raptor nest surveys
- Final Survey Report

Next Steps – Complete Vegetation and Wildlife Studies

- Nesting raptor survey - late May/early June 2025
- Martin River riparian habitat surveys – summer 2025
- Vegetation and habitat mapping – summer 2025
- Wildlife habitat evaluation - fall 2025
- Final study reports – fall 2025

Next Steps – Consultation and Development of PMEs

- AEA-proposed BMPs and PMEs
  - **Bear Safety Plan** (e.g., Battle Creek Amendment Article 63)
  - No hunting or fishing by contractors – standard BMP
  - **Site/Brush Clearing Window** outside May 1 – July 15 to avoid take of migratory bird nesting (e.g., Battle Creek Amendment Article 68)
  - **Site/Brush Clearing Window** outside May 1 – Aug 31 within 660 feet of bald eagle nests
  - **Fuel and Hazardous Substance Spill Plan** (e.g., Battle Creek Amendment Article 62)
  - **Erosion and Sediment Control Plan** (e.g., Battle Creek Amendment Article 61)

Next Steps – Consultation and Development of PMEs

- AEA-proposed BMPs and PMEs
  - **Fund ADF&G goat monitoring study**
    - ADF&G proposed capturing and collaring animals to monitor movement patterns pre- and post-construction
    - Monitoring would begin when license is amended
  - **Goat avoidance measures** (e.g., maintain 1,500 ft distance in all directions)
  - **Survey for nesting raptors** just prior to construction for current information on nest locations (delayed study component)
  - **Raptor nest disturbance avoidance plan** (e.g., timing and distance buffers)

Next Steps – Consultation and Development of PMEs

- What other potential mitigation measures?

Moose Habitat Example

- Previous mitigation for lost moose habitat (for original Bradley Lake Project) still active and acquiring property in mitigation area.
- Estimate of up to 504 and 681 acres could be inundated by raising Bradley Lake 14 ft and 28 ft, respectively, at maximum pool.

Habitat Types	Acres 14 ft	Acres 28 ft
Moderate-value Habitats		
Riverine Barrens	273.5	325.1
Upland and Subalpine Tall Alder Scrub	110.4	183.3
Ponds	1.9	2.6
Glaciated Subalpine Rock-Shrub Scrub-Meadow Complex	1.7	3.5
High-value Habitats		
Riverine Low and Tall Willow	116.0	166.1
Total Acres Regularly Used	503.6	680.6

Next Steps – Initiate ESA Section 7 Consultation

- USFWS IPAC list:
  - Short-tailed Albatross – pelagic, not likely to occur; no designated critical habitat
  - Steller's Eider – winter in Kachemak Bay; action area not included in critical habitat
- NMFS
  - Need to define the action area – Kachemak Bay? Cook Inlet?
    - April-October 2-3 barges per month during construction
    - Access to Project site limited to high high tides that occur about 4 days per month
  - What listed marine mammals may be present?
    - Steller sea lion Western DPS?
    - Cook Inlet beluga whale?
    - Fin whale?
    - Humpback whale?
    - Leatherback sea turtle?

FERC Process

- Kleinschmidt Associates: Betsy McGregor

FERC License Amendment Process Status

We are here

Responsible Party	Activity	Dates
AEA/Stakeholders	Initial Agency Consultation	Jan - Mar 2022
AEA	Conduct 2022 Preliminary Studies	Summer 2022
Stage 1: Initial Consultation Document (ICD)		
AEA	File ICD, Request for Non-federal Representative, & Newspaper Notice	Apr 2022
FERC	FERC Issues Notice of Amendment Accepted	May 2022
AEA	Provide Stakeholders with Notification of Joint Meeting	May 2022
AEA/Stakeholders	Hold Joint Agency/Public Meeting and Site Visit	Jun 14-15, 2022
FERC/Stakeholders	Comments on ICD/ Proposed Studies Due	Aug 14, 2022
Stage 2: Study Planning and Implementation		
AEA	Distribute Draft Study Plans	Nov 2022
Stakeholders	Comments on Draft Study Plans	Dec 2022
AEA	Paused Amendment Process and Refined Project Design	Mar 2023 – Feb 2024
AEA/Stakeholders	Project Update and Study Plan Meetings	Mar - Apr 2024
AEA/Stakeholders	Implement Year 1 Studies	2024
AEA/Stakeholders	**Study Reports & NHPA Section 106 Consultation Meetings**	**Jan - Feb 2025**
AEA	Implement Year 2 Studies and Review Study Results	2025
AEA/Stakeholders	Consultation with agencies, Tribes, stakeholders	2025
AEA	File Draft Amendment Application	Jan 2026
AEA	File Final Amendment Application	Spring 2026

Thank you for your participation!