Dixon Diversion Project

Cultural Resources and NHPA Section 106 Meeting

January 30, 2025

ALASKA ENERGY AUTHORITY

Kleinschmidt

DOWL

Meeting Goals

- **Public Session**
  - Project Overview
  - FERC Amendment Process
  - 2024 Cultural Resources Study
    - Area of Potential Effect
    - Environmental Setting
    - 2024 Surveys
- **Non-Public Session**
  - Cultural Context
  - Known AHRS Sites
  - Section 106 Consultation

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DIXON DIVERSION

Bryan Carey, P.E.
Director of Owned Assets

Project Overview

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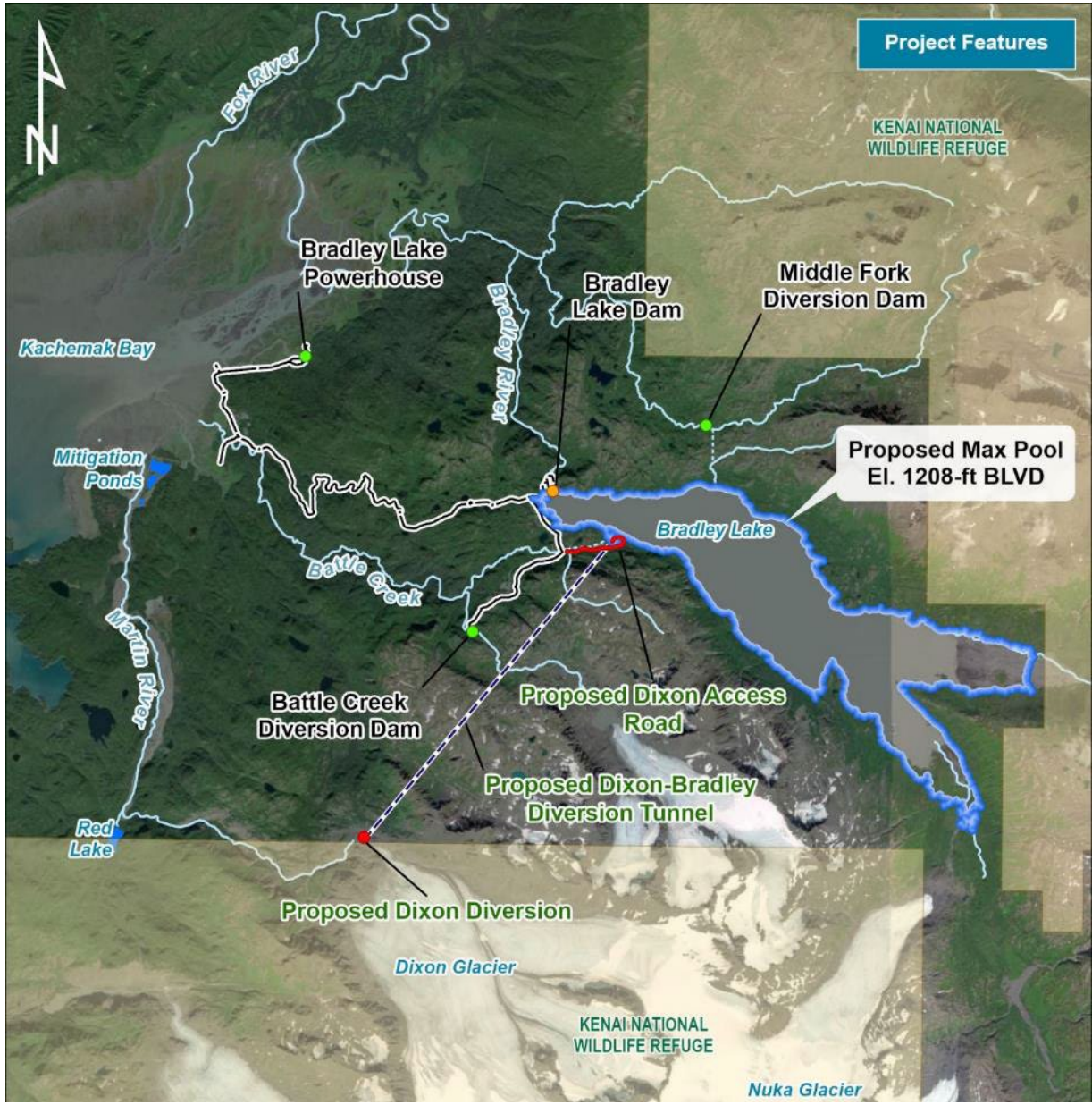
Current Project Overview

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

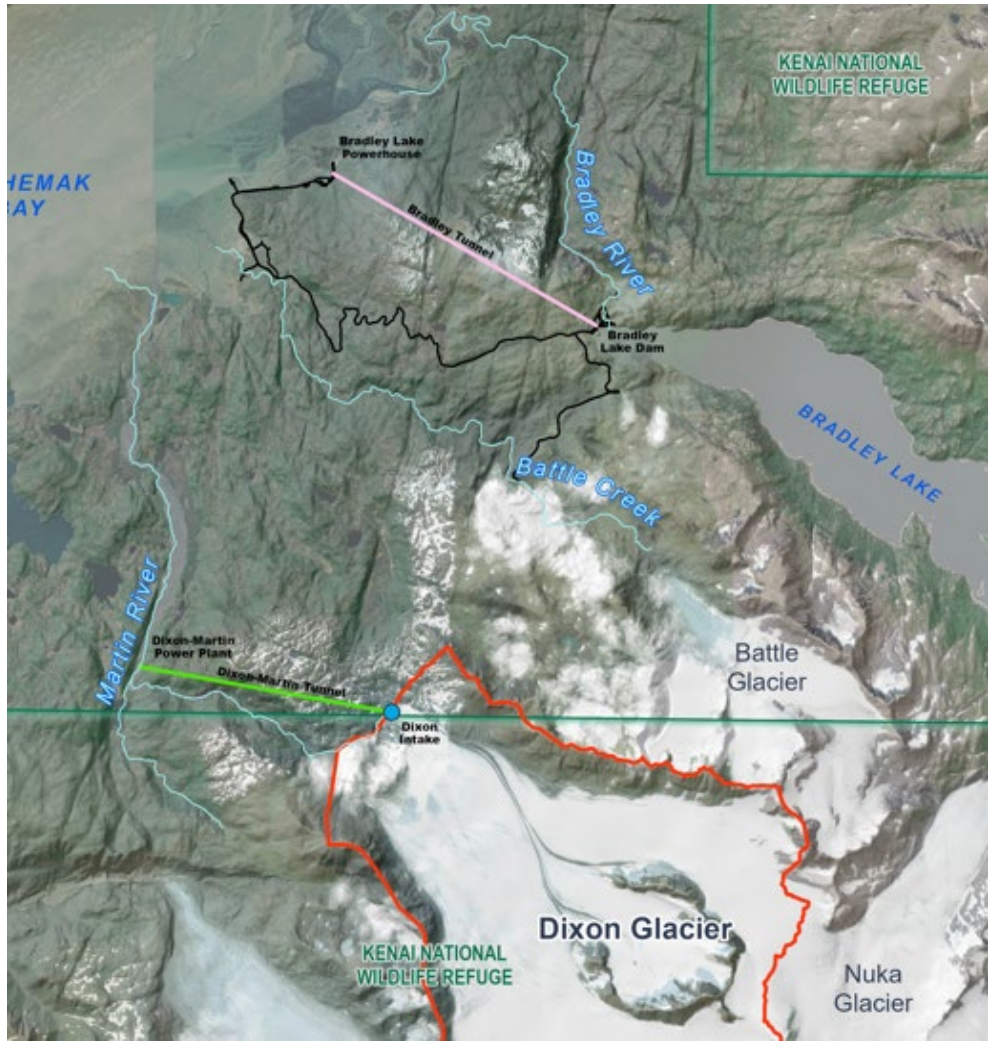
All on State-owned Land

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



Previous Project Alternatives



- **Martin River Alternative Eliminated**
  - New MR power plant
  - Diversion to new MR power plant
  - New road to new MR power plant
  - New overhead transmission lines
- **Bradley Lake Alternative Selected**
  - No new road to Dixon Diversion Dam
- **Current design minimizes footprint**

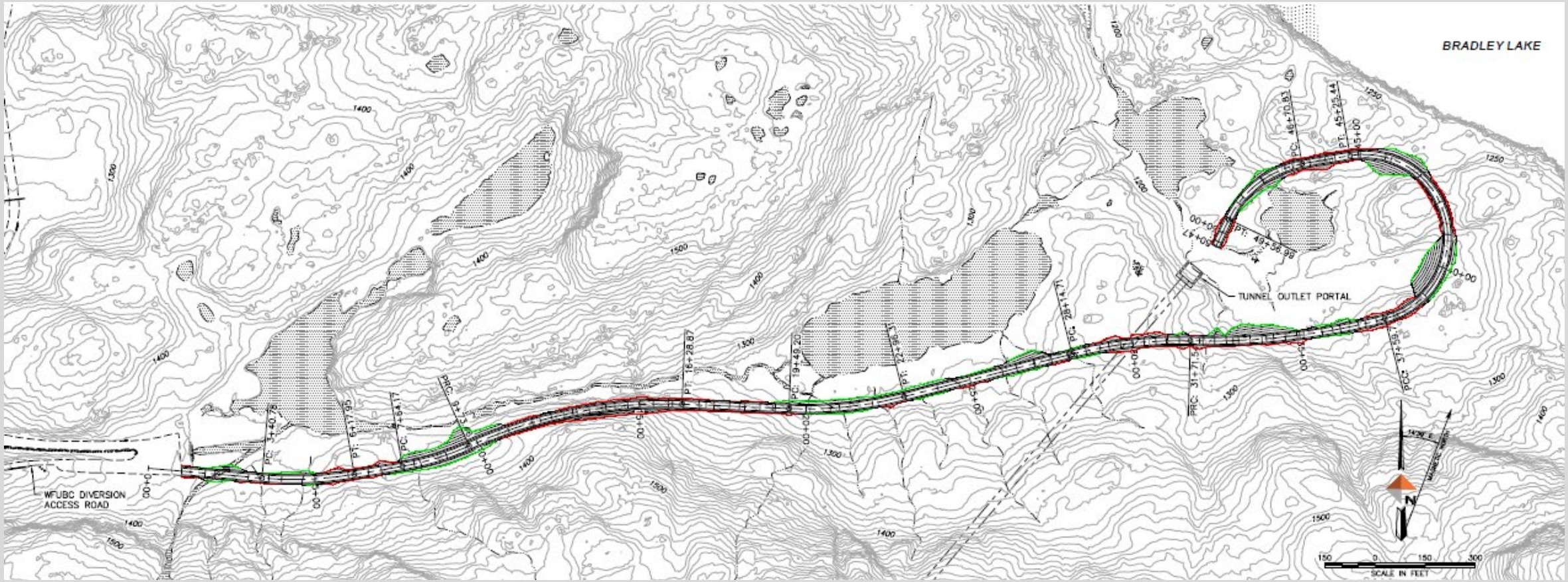
Dixon Glacier Source

Dixon Diversion Dam and Tunnel Intake Site

Dixon Diversion Dam and Tunnel

- Diversion Dam
  - ~25 feet high
- Subsurface Diversion Tunnel to Bradley Lake
  - 4.7 miles long
  - 1,400 cfs capacity
  - Divert water May-October

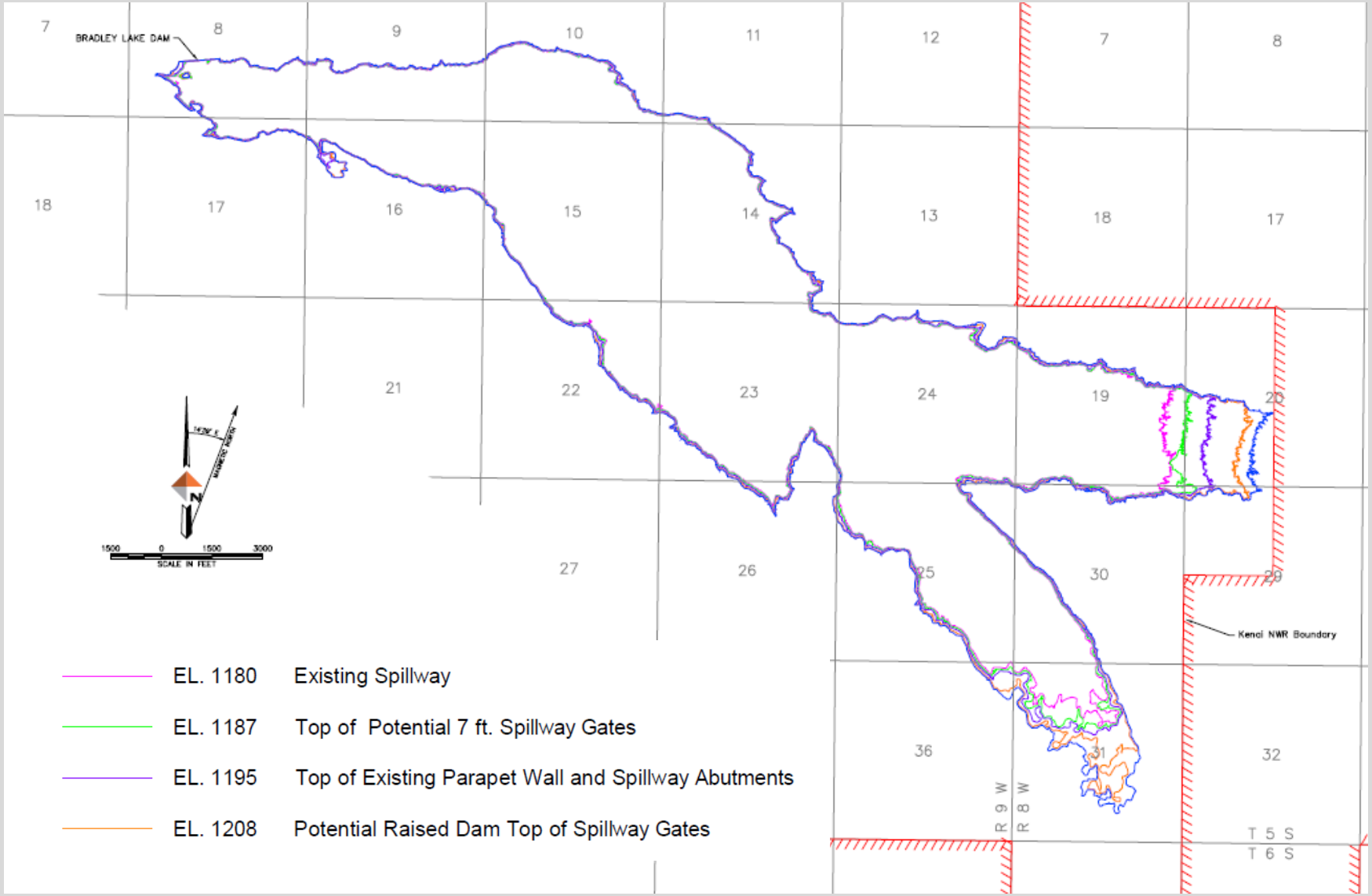
New Access Road



New access road from WFUBC Diversion Road to the Dixon Tunnel Outlet Portal

Bradley Lake Dam and Pool Raise

- Three alternatives
  - 7, 14, 28 ft raise
- 28-ft alternative
  - 1,208 ft elev
  - 404-acre increase in pool surface
  - State land



QUESTIONS?

FERC Process

- Kleinschmidt Associates: Betsy McGregor

FERC License Amendment Process Status

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

We are here

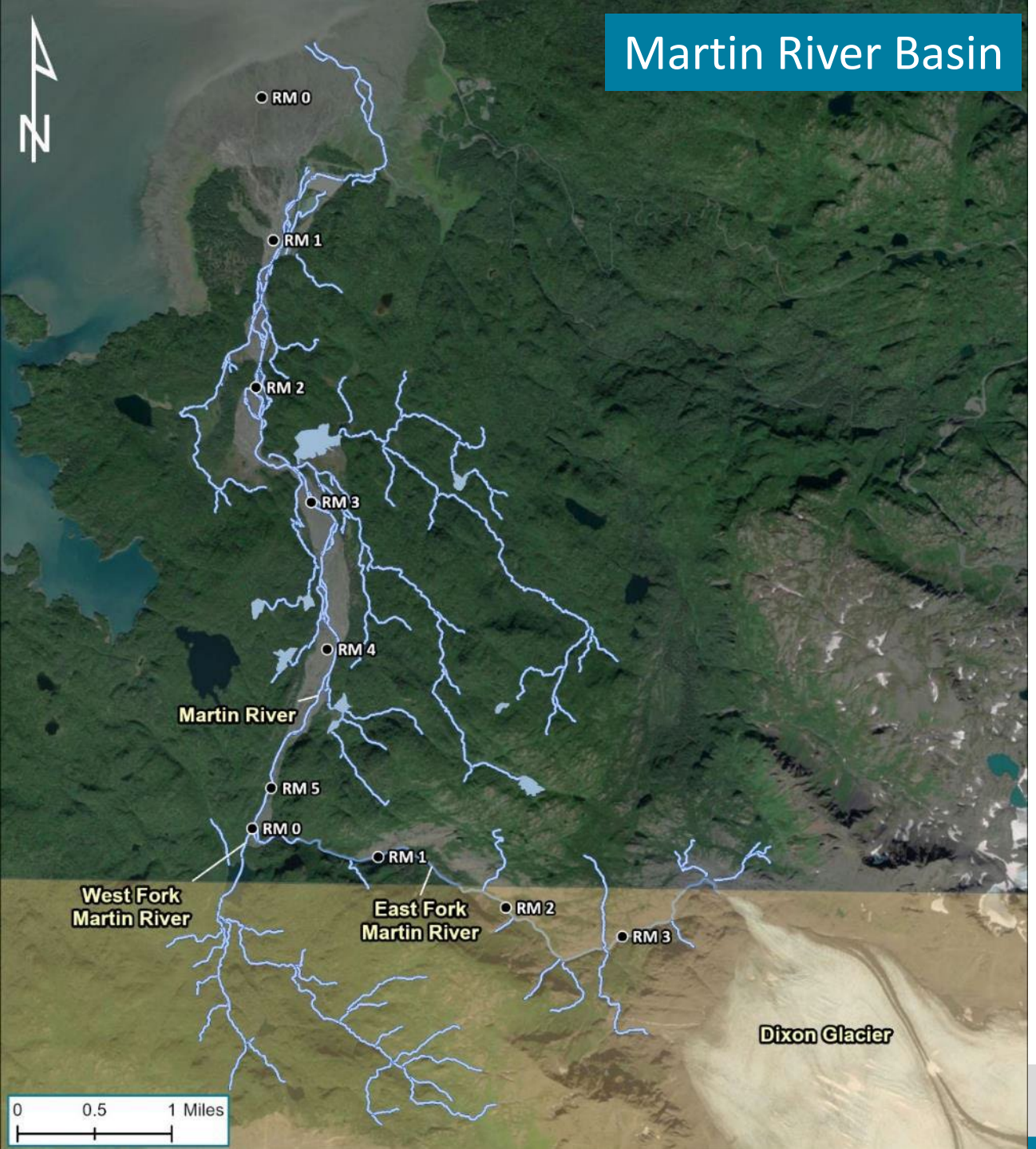
Dixon Diversion Project Studies

- **Terrestrial Resources**
  - Wetlands (2024)
  - Vegetation & Wildlife Habitat Mapping (2024-2025)
  - Wildlife Habitat Evaluation (2025)
  - Raptor Nesting and Migration (2025)

- **Cultural Resources**
  - Cultural Resources Study (2024)
  - Section 106 Consultation (2025)

Dixon Diversion Project
Martin River Aquatic Studies

- Streamflow Gaging (2023-2025)
- Hydraulic Modeling and Aquatic Habitat Connectivity (2024)
- Geomorphology (2023-2024)
- Water Quality Monitoring (2023-2024)
- Aquatic Habitat Characterization
- Martin River Fish Use (2024-2025)
- Red Lake Outlet Video Counting Tower (2022-2025)



ALASKA ENERGY

Martin River Sections

Lower Martin River

- mean high tide to RM 2.55

Middle Martin River

- RM 2.55 to RM 5.3 (EF/WF confluence)

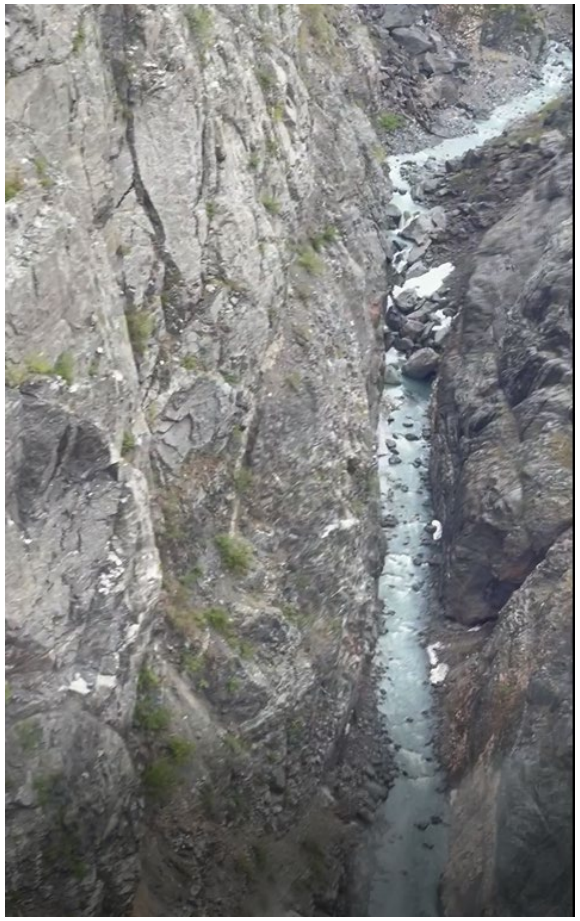
East Fork Martin River (Canyon)

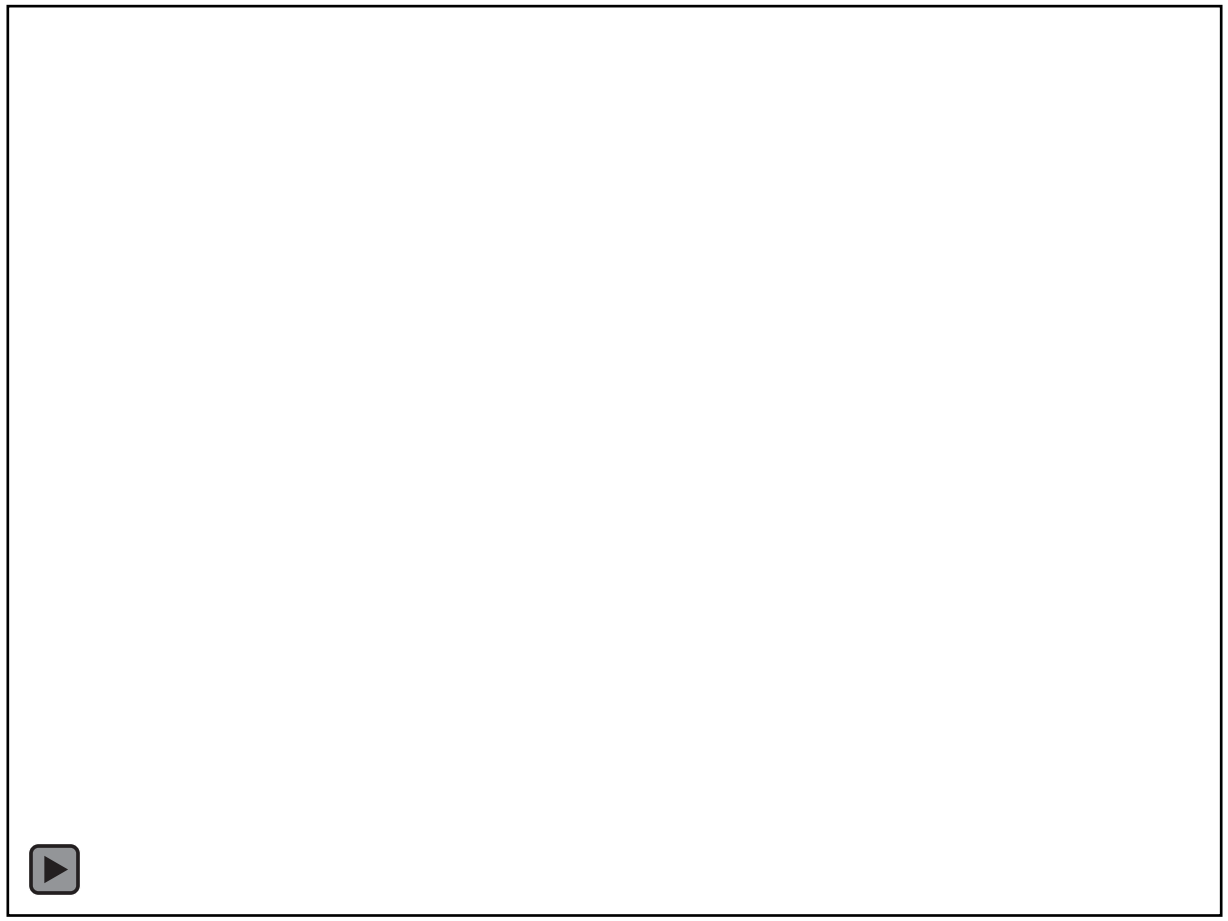
- 3.8 miles from Martin River to Dixon Glacier

West Fork Martin River (Red Lake)

East Fork Martin River (3.8 miles)

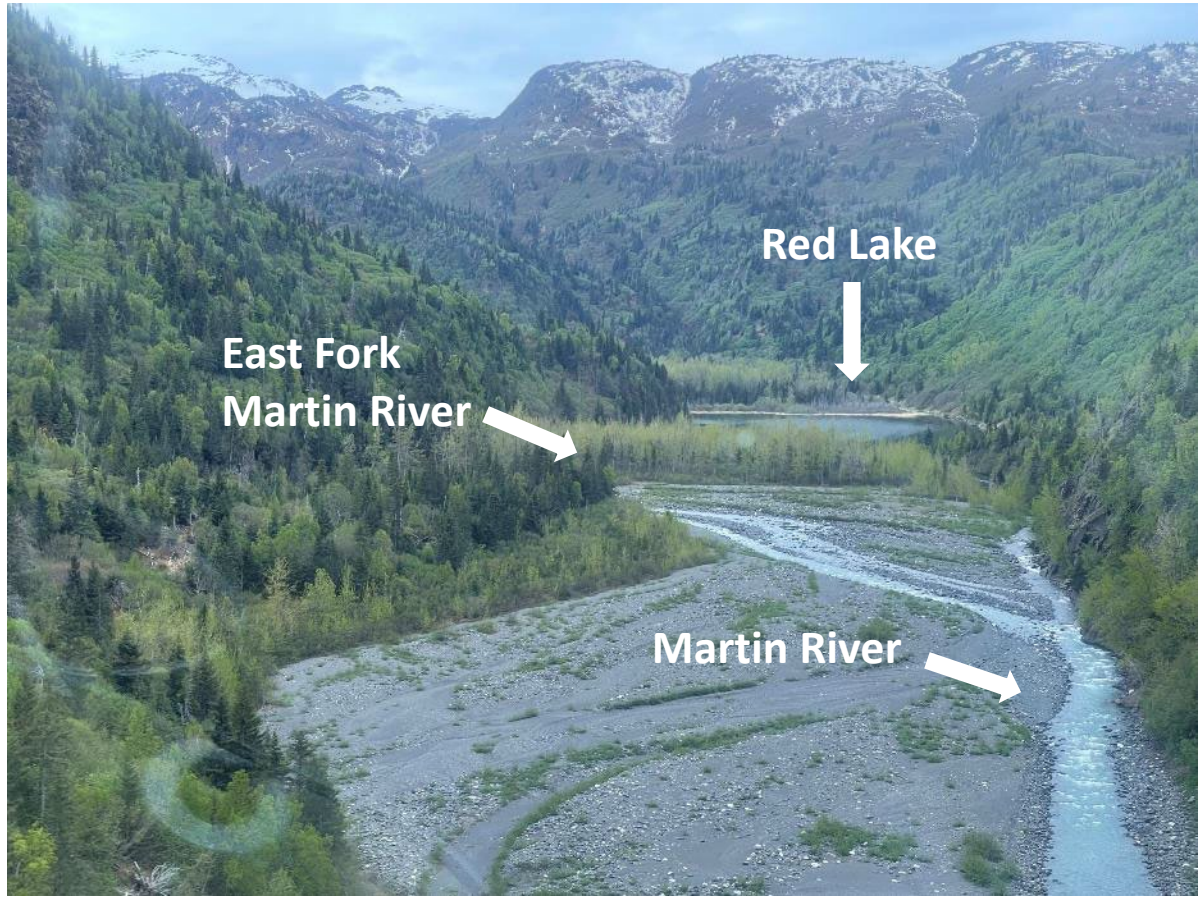
East Fork Martin River Canyon



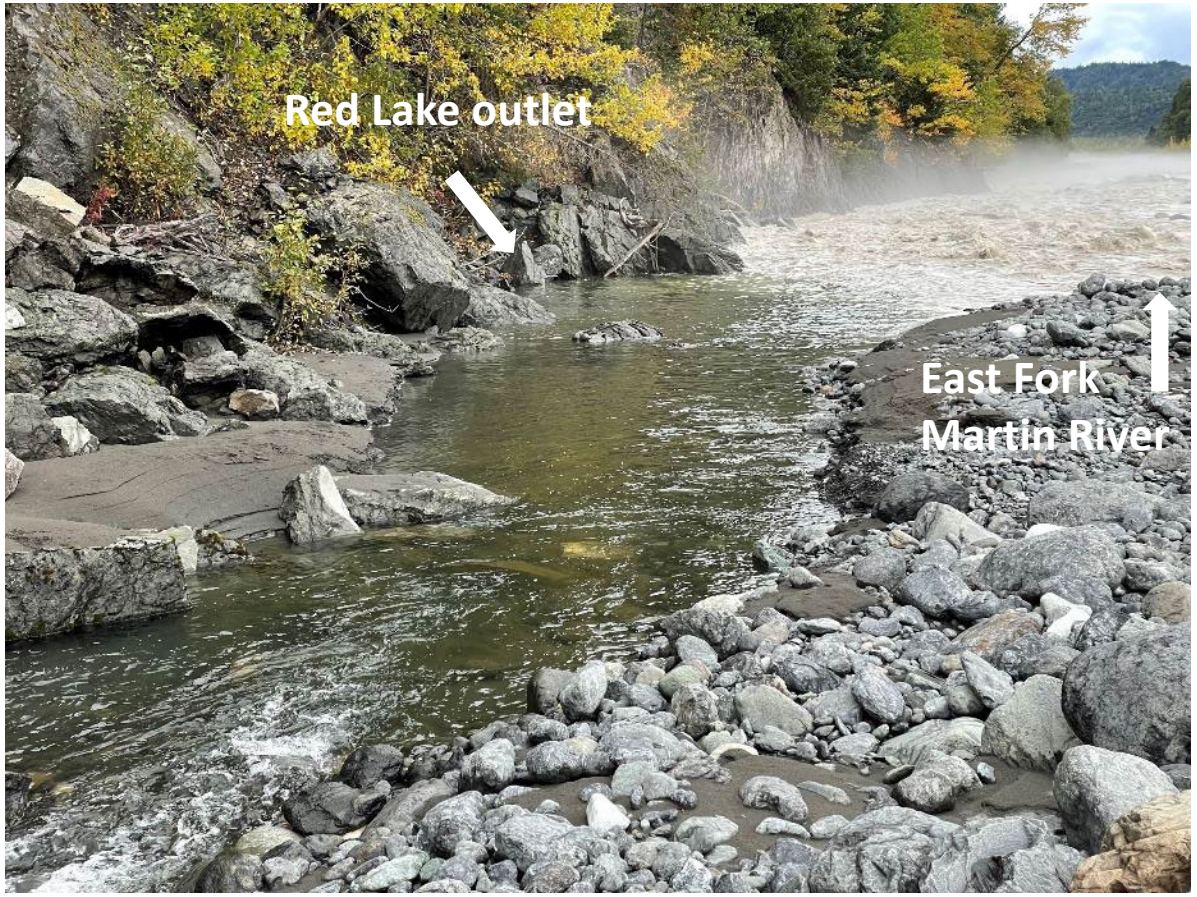


East Fork Martin River at its mouth

Confluence of East Fork and West Fork Martin River



Martin River at the East Fork and West Fork (Red Lake outlet) confluence looking south.



Red Lake outlet flowing into the Martin River at its confluence with the East Fork Martin River looking north.

Martin River Middle Section (RM 2.55 – RM 5.3)

Velocity and turbidity in mainstem becomes very high in summer and early fall.

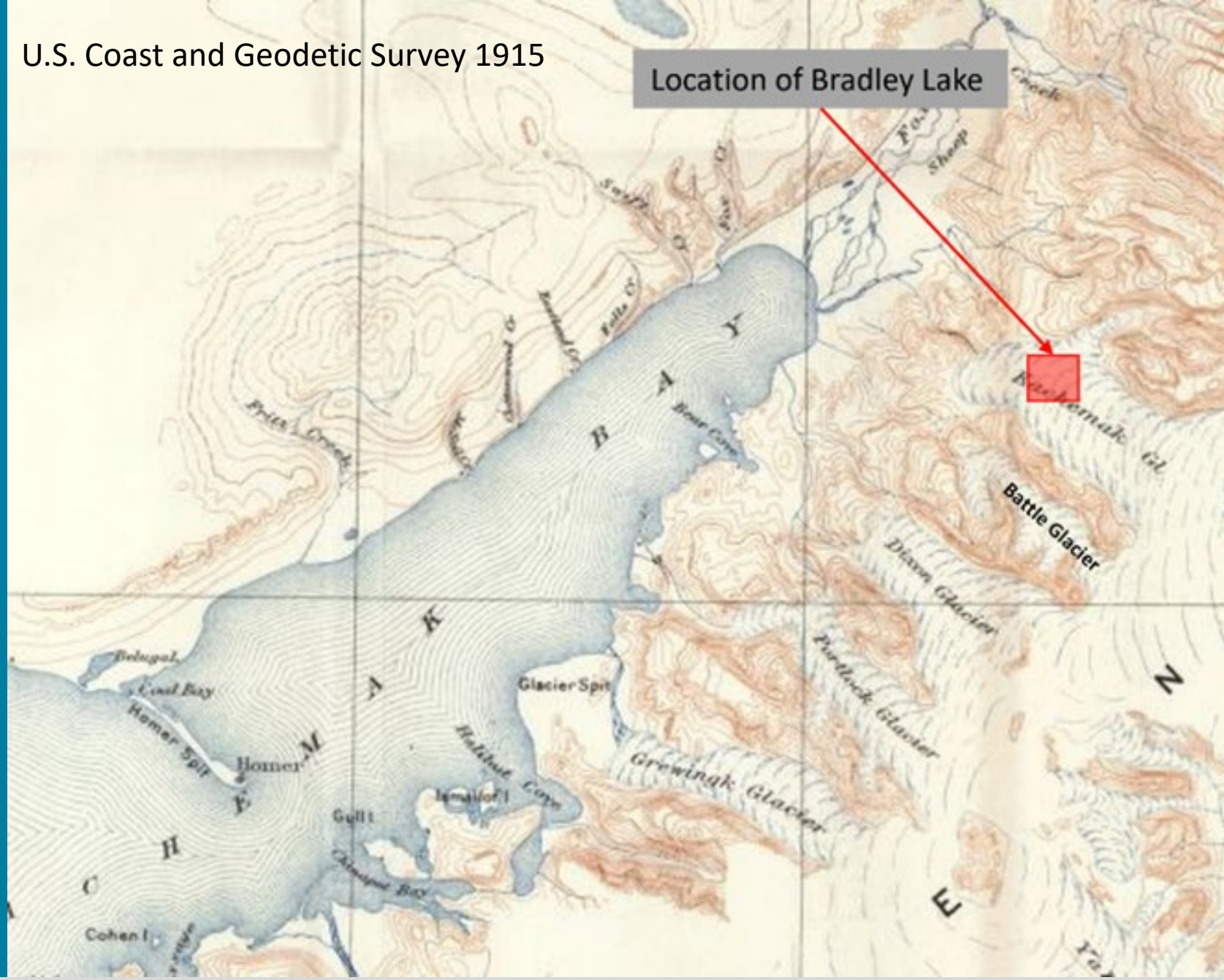
There are a few large off-channel complexes that provide fish habitat.

Lower Martin River (mean high tide to RM 2.55)

River is more spread out and velocity decreases.

Cultural Resources Study

- DOWL:
  Jay Rapoza



Goals & Objectives

Goal:

- inventory Area of Potential Effect (APE) for historic properties

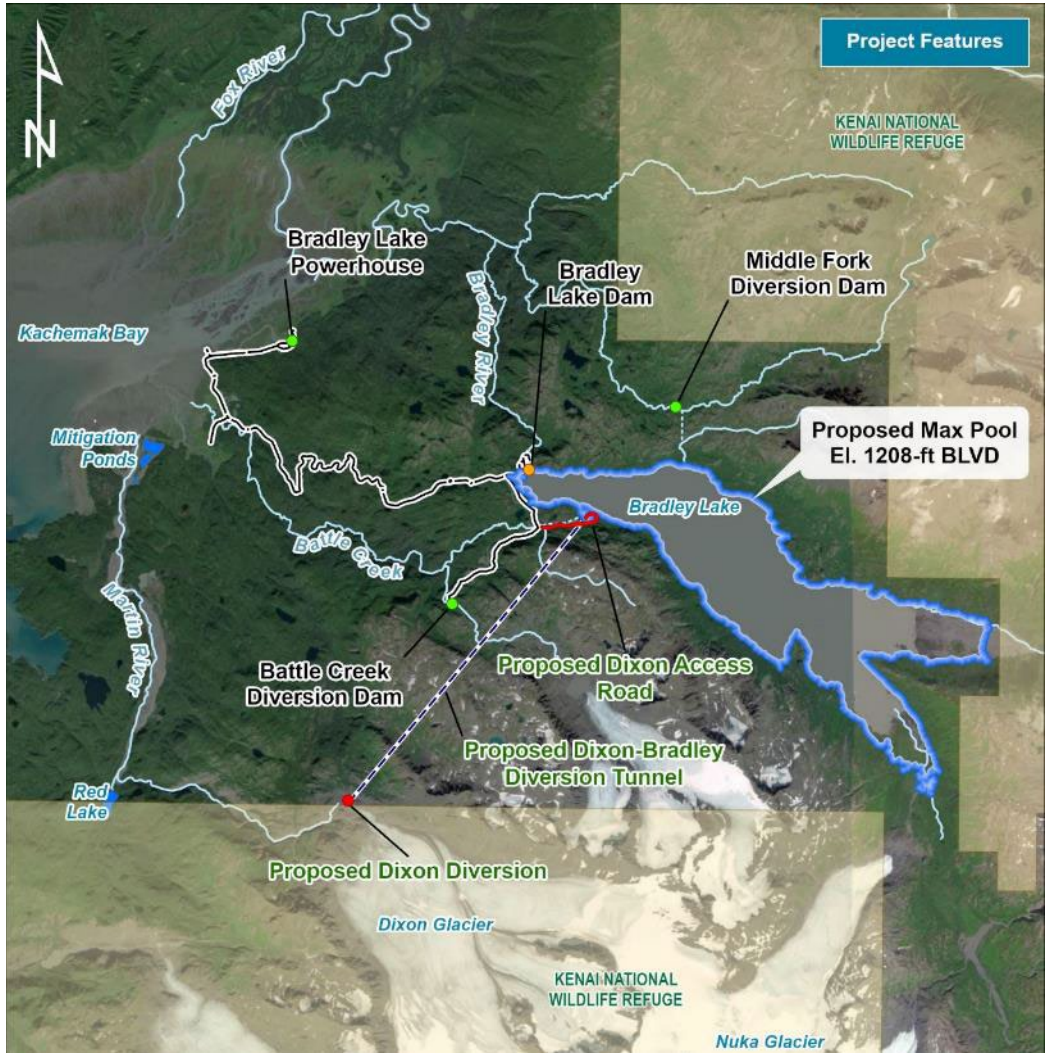
Objectives:

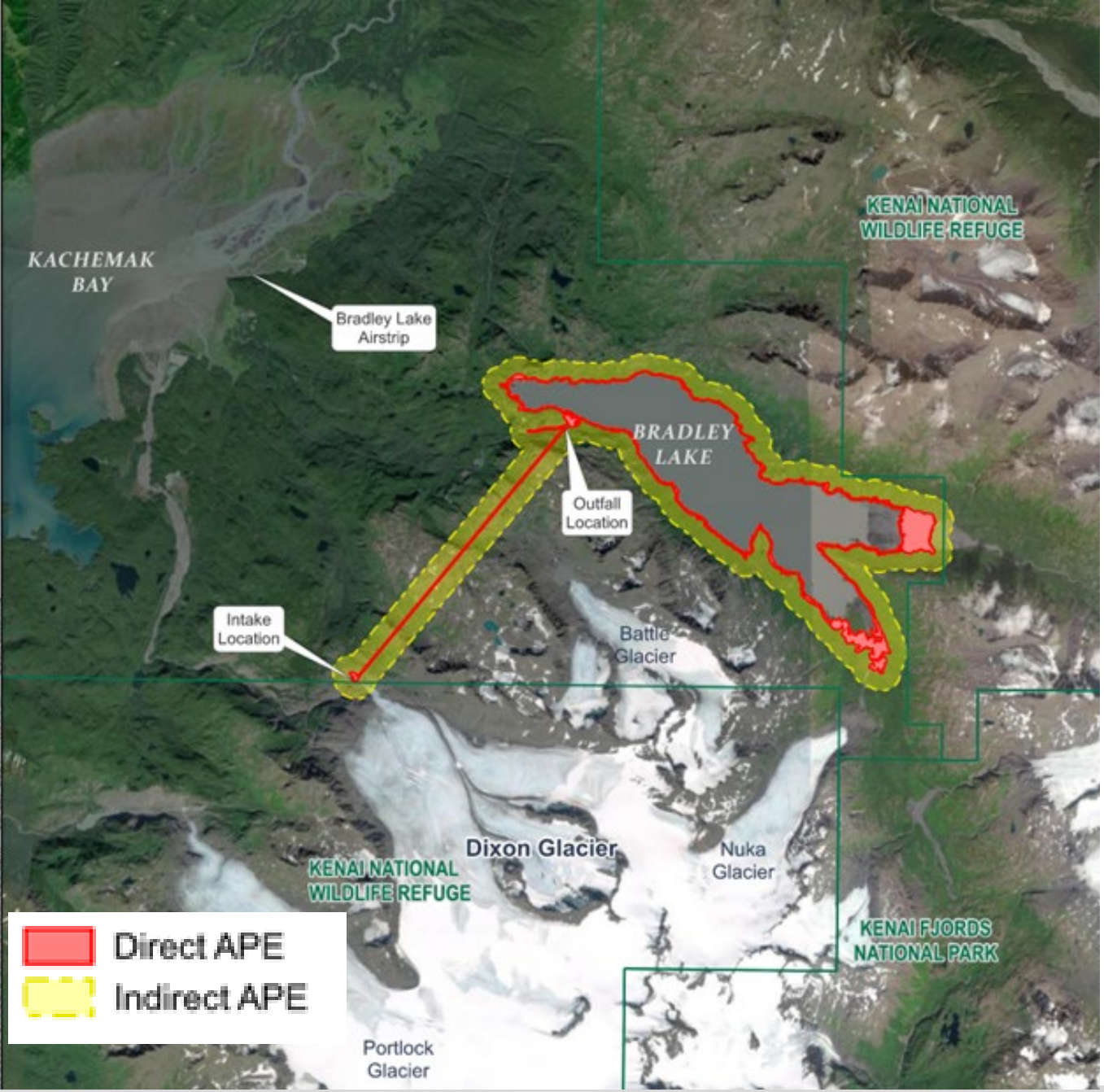
- Establish APE
- Conduct Research from available sources
- Conduct Survey
- Support Section 106 Consultation
- Support Development of HPMP

Project Location

- Kenai Peninsula Borough
- Across Kachemak Bay NE from Homer
- 59°45'11"N 150°50'50"W

Meridian	USGS Quad Map	Township	Range	Sections
Seward	Seldovia C-3	5 South	8 West	19,25,30,31
			9 West	8, 16, 17, 24, 25, 36
			10 West	36





Direct and Indirect APE

- **Direct APE:**
  - **50-ft-wide buffer around Project disturbance area**
    - Bradley Dam and pool raise
    - Diversion tunnel intake & outlet
    - 1-mi-long new access road
    - Dixon diversion structure
- **Indirect APE:**
  - **0.25-mi-wide buffer around Direct APE**

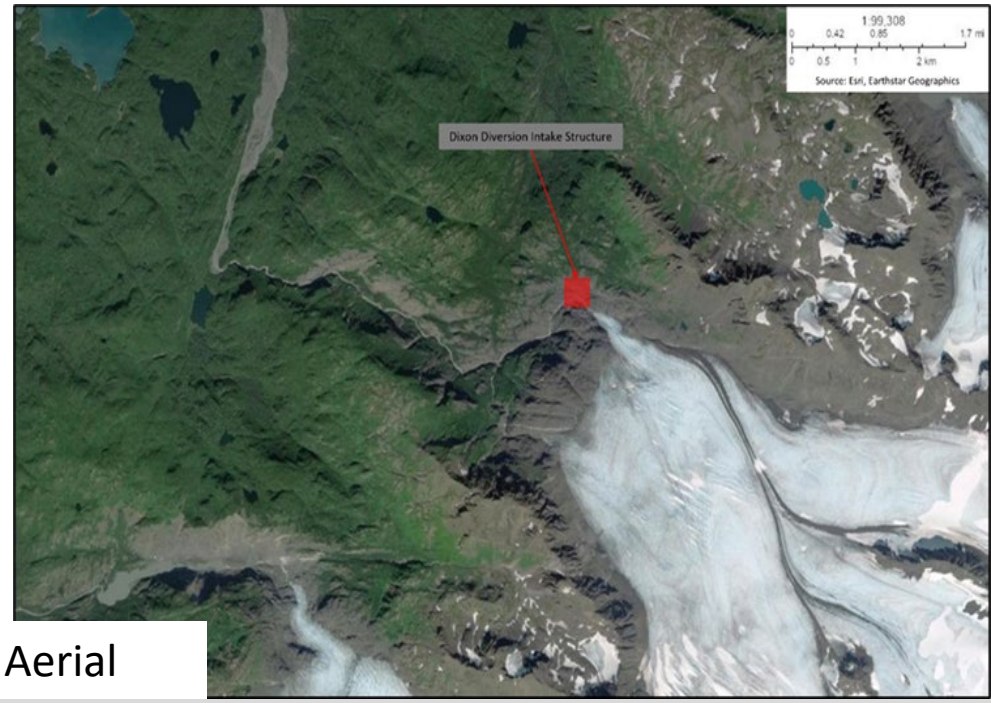
Environmental Setting

- Southern regions of the Kenai Mountains
- Between Bradley Lake and Dixon Glacier
- Alpine habitat
  - From mountain tops to forest zones
  - Higher elevations
    - Alpine shrub communities and rock outcrops
- Vegetation
  - Mosses
  - Lichens
  - Shrub species

Environmental Setting

- **Deglaciation**
  - Kachemak Bay recession starting 12,000 BP
  - Glacial refugia appears south shore of Kachemak Bay around 10,000 BP
  - Bradley Lake deglaciated in last century
  - Dixon diversion tunnel intake deglaciated within the last decade

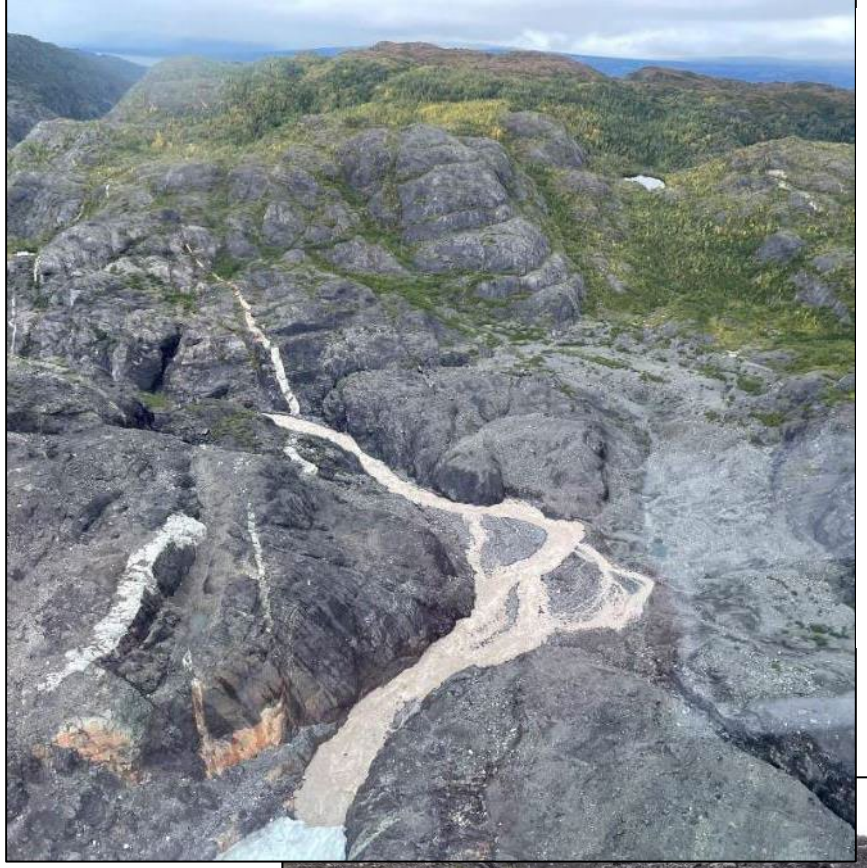
1952 Aerial



2020 Aerial

Environmental Setting

- **Diversion Dam and Tunnel Intake**
  - Deglaciated within the last decade
  - Between 1950 and 2006, glacial recession was 1.55 mi
  - Continual recession



Dixon Diversion structure and intake location July 2024

- **Bradley Lake & Diversion Tunnel Outlet**
  - Deglaciated sometime in the early twentieth century

Methods – Desktop Review

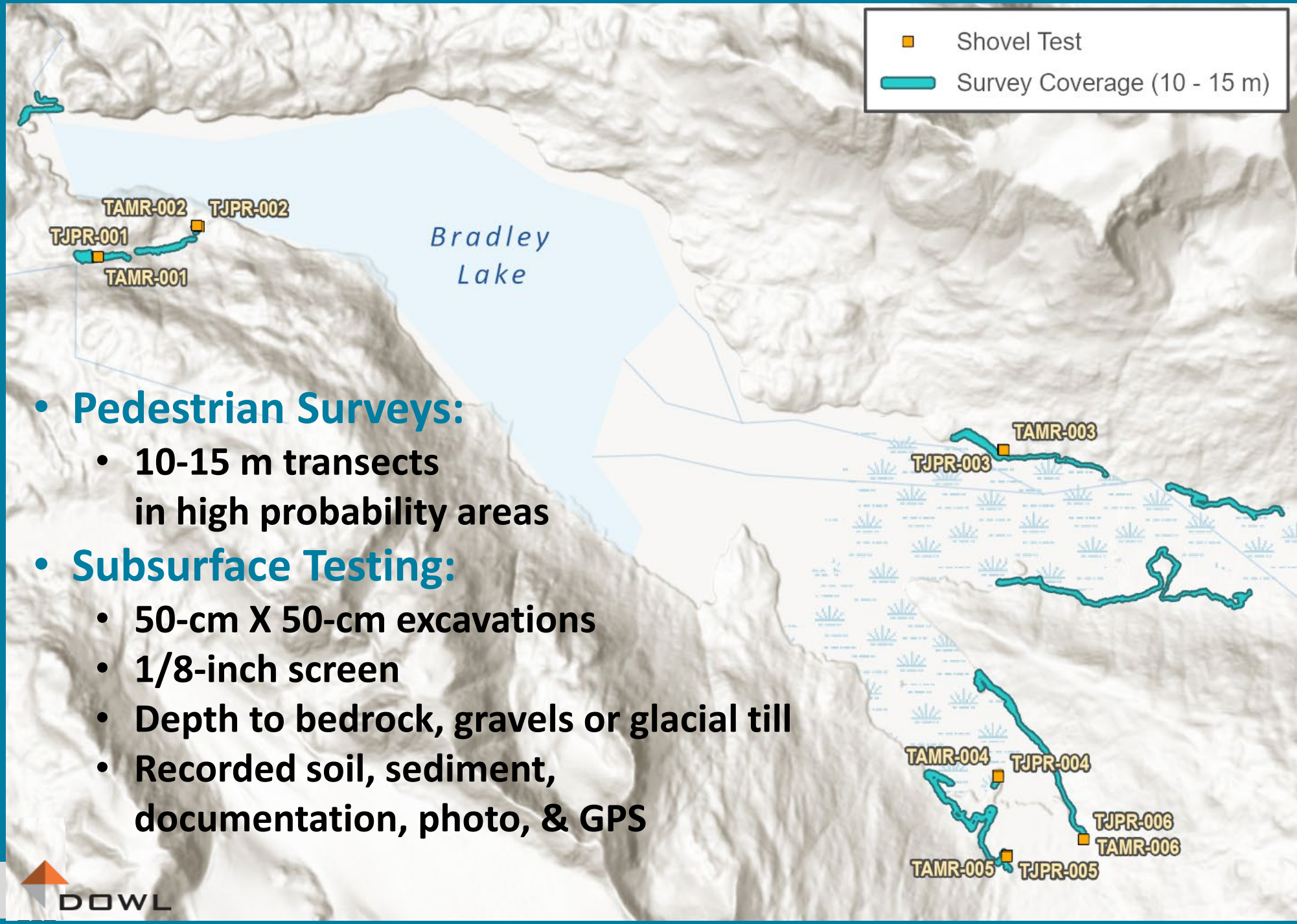
- AHRS database
  - 1 site within 4 miles
- Cultural resources listed in the AHRS were reviewed for resource nature, temporal significance, Determination of Eligibility (DOE) and NRHP status, and material remains
- Reviewed previous cultural resources investigations to identify previous cultural resources in or near the survey area

Survey Year	Title	Survey Type	Reference
1979	Field Survey in Support of the Bradley Lake Hydroelectric Project	Field Investigation	Steele 1979
1980	Field Survey in Support of the Bradley Lake Hydroelectric Project	Field Investigation	Steele 1982
1983	Helicopter Reconnaissance in Support of the Bradley Lake Hydroelectric Project	Field Investigation	APA 1984
1983	Field Survey in Support of the Bradley Lake Hydroelectric Project	Field Investigation	Woodward-Clyde Consultants (1984)
1992	BLM Examination for Cultural Resources, of Revoking Lands Withdrawn in the Bradley Lake/Upper Kachemak Bay Area	Desktop Investigation	Redding-Gubitosa 1994
2012	Cultural Resource Survey of the Battle Creek to Bradley Lake Diversion	Field Investigation	HDR 2013

Methods – Field

- **High probability areas (pedestrian surveys and subsurface testing)**
  - Shorelines
  - Elevated benches and knolls
  - Level, well-drained grounds
- **Low probability areas (majority of the APE; no pedestrian surveys or testing)**
  - Steep terrain, slopes 60-90 percent
  - Wetlands
  - Glacial meltwater drainages
  - Exposed bedrock
  - Recent deglaciation (tunnel intake portal)
- **Areas of human use**
  - Bradley Lake Project associated structures
  - **No other significant cultural surface features identified**

Survey Coverage and Subsurface Testing Sites



- **Pedestrian Surveys:**
  - **10-15 m transects in high probability areas**
- **Subsurface Testing:**
  - **50-cm X 50-cm excavations**
  - **1/8-inch screen**
  - **Depth to bedrock, gravels or glacial till**
  - **Recorded soil, sediment, documentation, photo, & GPS**

DOWL

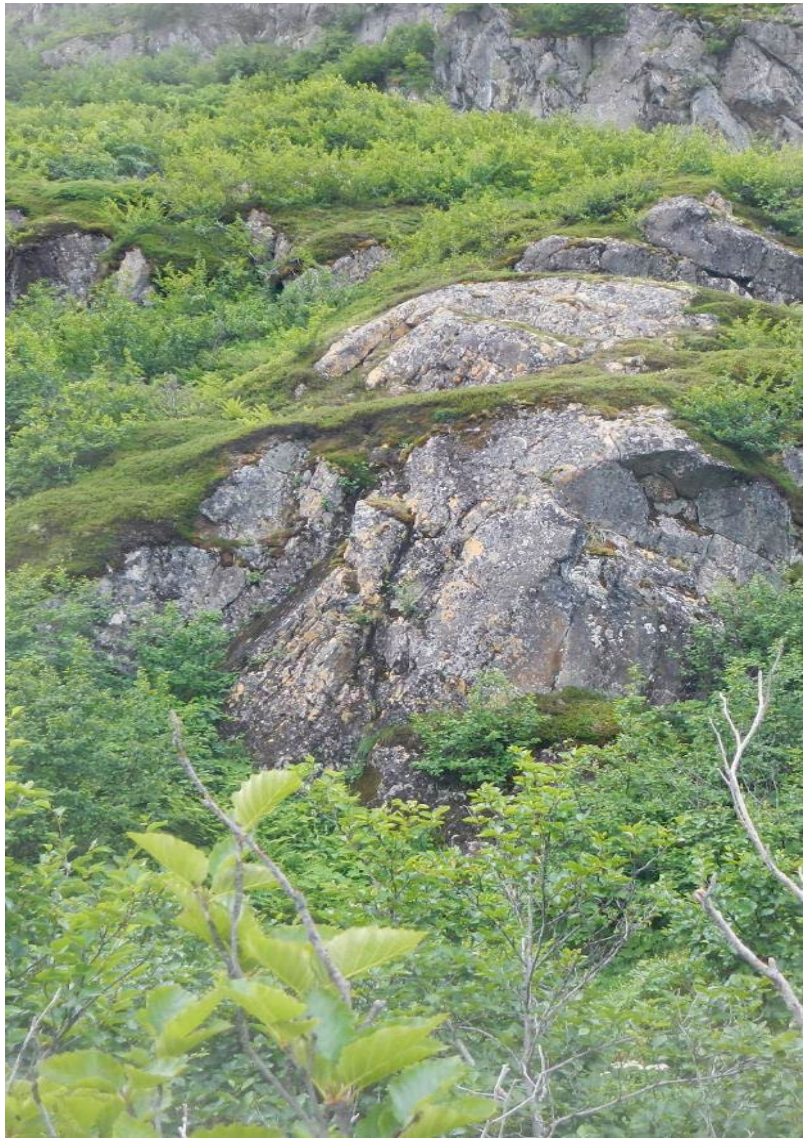
Landscape Photos and Structures Identified in APE During Pedestrian Survey

Glacial outwash from Kachemak Creek in the northeast arm of Bradley Lake within the APE, view to southwest, photo taken July 2024.

Steep cliffs found throughout the APE around Bradley Lake, view to northeast, photo taken July 2024.

Glacial outwash and typical topography within the APE, view to northwest photo taken July 2024.

Typical exposed bedrock found throughout the APE, view to northwest, photo taken July 2024.



Exposed bedrock and vegetation typical within the APE, view to northwest, photo taken July 2024.

Typical topography and vegetation within the access road portion of the APE, view to northeast, photo taken July 2024.

Glacial outwash and tributaries from Nuka Glacier within the APE, view to northeast, photo taken July 2024.

Existing Bradely Lake Dam within the APE, view to northeast, photo taken July 2024.

Surface gravel deposits associated with glacial activity found throughout the APE, view to northeast, photo taken July 2024.

Bradley Lake Dam recorded at the dam during pedestrian survey, view to northeast, photo taken July 2024.

Bradley Lake Project structure recorded at the proposed access road during pedestrian survey, view to south, photo taken July 2024.

Bradley Lake Project structure recorded at the proposed access road during pedestrian survey, view to north, photo taken July 2024.

Bradley Lake Project related structure recorded at the dam during pedestrian survey, view to south, photo taken July 2024.

Subsurface Test Areas 1 & 2

- Upper West Fork Battle Creek Diversion, along the proposed gravel access road to outlet portal

Subsurface Test Areas 3 through 6

- **Test Area 3**
  - Shoreline of Kachemak Creek arm of Bradley Lake
  - TAMR-003 and TJPR-003
- **Test Area 4**
  - Knoll surrounded by wetlands at Nuka Glacier arm of Bradley Lake
  - TAMR-004 and TJPR-004
- **Test Area 5**
  - Knoll surrounded by wetlands at Nuka Glacier arm of Bradley Lake
  - TAMR-005 and TJPR-005
- **Test Area 6**
  - Knoll surrounded by wetlands at Nuka Glacier arm of Bradley Lake
  - TAMR-006 and TJPR-006

Subsurface Test Data – Area 1

Subsurface Test	Strata	Strata Depth (cm)	Cultural Material
TAMR-001	Humic root mat and dark brown silt loam	0-5	None
	Dark brown silt loam with gravel, cobbles, and boulders	5-24	None
	Grayish brown sand with gravel and large cobbles	24-32 (BOE)	None
TJPR-001	Humic root mat and dark brown silt loam	0-5	None
	Dark brown silt loam	5-22 (BOE)	None

TJPR-001, southwest wall

Subsurface Test Data – Area 2

Sub-surface Test	Strata	Strata Depth (cm)	Cultural Material
TAMR-002	Humic root mat and dark brown silt loam	0-5	None
	Dark brown silt loam with small gravel	5-40	None
	Light brown sand with gravel	40-58	None
	Light gray-brown glacial till matrix with gravel	58-60 (BOE)	None
TJPR-002	Humic root mat and dark brown silt loam	0-6	None
	Dark brown silt loam with small gravels	6-21 (BOE)	None


TAMR-002, north wall


TJPR-002, north wall

Subsurface Test Data – Area 3

Sub-surface Test	Strata	Strata Depth (cm)	Cultural Material
TAMR-003	Humic root mat and dark brown silt loam	0-12	None
	Dark brown silt loam with gravel and cobbles	12-30 (BOE)	None
TJPR-003	Humic root mat and dark brown silt loam	0-8	None
	Dark brown silt loam with gravel and cobbles	8-21 (BOE)	None


TAMR-003, north wall


TJPR-003, north wall

Subsurface Test Data – Area 4

Sub-surface Test	Strata	Strata Depth (cm)	Cultural Material
TAMR-004	Humic root mat and dark brown silt loam	0-9	None
	Dark brown silt loam with gravel and cobbles	9-20	None
	Gravelly sand and glacial till matrix	20-40 (BOE)	None
TJPR-004	Humic root mat and dark brown silt loam	0-4	None
	Brown silt	4-10	None
	Dark gray silt clay	10-23	None
	Reddish-brown silt clay with gravel and cobbles	23-30	None


TAMR-004, south wall


TJPR-004, northwest wall

Subsurface Test Data – Area 5

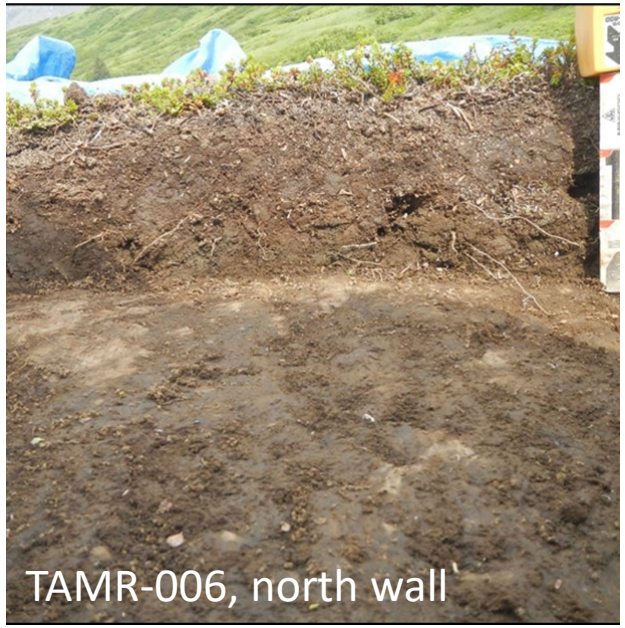
Subsurface Test	Strata	Strata Depth (cm)	Cultural Material
TAMR-005	Humic root mat and dark brown silt loam	0-8	None
	Dark brown silt loam with roots and gravels	8-12	None
	Very dark brown silt with gravels and cobbles	12-22`	None
	Light gray brown glacial till matrix with cobbles and boulders	22-28 (BOE)	None
TJPR-005	Humic root mat and dark brown silt loam	0-6	None
	Light gray brown glacial till matrix with gravels, cobbles, and boulders	6-21 (BOE)	None


TAMR-005, south wall


TJPR-004, southeast wall

Subsurface Test Data – Area 6

Subsurface Test	Strata	Strata Depth (cm)	Cultural Material
TAMR-006	Humic root mat and dark brown silt loam	0-5	None
	Gray brown silt loam, bedrock	5-14 (BOE)	None
TJPR-006	Humic root mat and dark brown silt loam	0-8	None
	Brown silt with gravels	8-22 (BOE)	None


TAMR-006, north wall


TJPR-006, north wall

Summary and Results

- **Desktop review completed**
  - Researched at state, federal, and institutional repositories
  - Historic images, AHRS data, and topographic data
- **Developed a Project-specific cultural context**
- **Completed pedestrian survey and 12 subsurface excavations at high potential areas within APE**
  - Pedestrian survey **did not** identify any archeological, historic, or architectural features
  - 12 subsurface excavations **did not** identify any archeological, historic, or architectural material
  - Surveys not conducted at tunnel intake portal due to recent deglaciation and scarce evidence of human activity in similar alpine areas

*DOWL does not represent that identified all potentially significant cultural resources have been identified which may be present in the survey area, as cultural resources may exist in such a way that their discovery may require specialized equipment, intensive excavations, extensive consultations or research, or other methods or technologies (e.g., ground-penetrating radar, magnetometer).

Next Steps for 2025

- **NHPA Section 106 Consultation**
  - SHPO, Alaska Native Tribes and other Interested Parties
  - Review APE and findings
  - Seek concurrence
- **Develop a Historic Property Management Plan**
  - Includes Inadvertent Discovery Plan

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QUESTIONS?

Thank you for your participation!

NON-PUBLIC SESSION

NHPA Section 106 Meeting

QUESTIONS AND DISCUSSION

Thank you for your participation!