Copper Valley ELECTRIC
A Touchstone Energy® Cooperative

January 24, 2025

VIA E-FILING

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

Subject: Solomon Gulch Hydroelectric Project (FERC No. 2742-039)
Draft Study Report

Dear Secretary Reese:

Copper Valley Electric Association, Inc. (CVEA or Licensee) is the licensee, owner, and operator of the 12-megawatt Solomon Gulch Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC) No. 2742-039. The Project is located on Solomon Gulch Lake near Valdez, Alaska. The existing FERC license for the Project expires on May 31, 2028.

On April 28, 2023, CVEA filed a filed a Notice of Intent to File a License Application and the Pre-Application Document along with request with FERC to use the Traditional Licensing Process (TLP). On June 23, 2023, FERC granted approval for CVEA to use the TLP. Since this approval, CVEA has worked with stakeholders to develop a Final Study Plan (FSP) and has now completed the seven studies described therein.

CVEA submits the attached Draft Study Report (DSR), which includes draft technical reports from the seven studies conducted in summer 2024, of which the Cultural Resources Study has been labeled as "CUI//PRIV" and is being filed as Privileged.

A copy of the DSR is being distributed to those on the attached Project distribution list and on CVEA's Relicensing website (www.cvea.org/about/project-reports/solomon-gulch-relicensing). CVEA is requesting stakeholders provide comments no later than 60 days (March 25, 2025) after filing of the DSR. After stakeholder comments are addressed, study results will be finalized in a Final Study Report. Finally, a Draft License Application for this relicensing will be filed by December 2025.

If you have any questions or require additional information, please contact Coreen Palacios, Regulatory & Compliance Specialist, at CPalacios@cvea.org or 907-822-8301.

Sincerely,

Jaime L. Matthews

Jaime Matthews,
Chief Executive Officer, Copper Valley Electric Association

Cc: Distribution List
Coreen Palacios and Wayne McKinzey, CVEA
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Attachments: Distribution List
Draft Study Report for the Solomon Gulch Hydroelectric Project

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DRAFT STUDY REPORT

SOLOMON GULCH HYDROELECTRIC PROJECT

FERC No. P-2742

Prepared for:

Copper Valley Electric Association

Prepared by:

Kleinschmidt Associates

January 2025

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DEFINITIONS OF TERMS, ACRONYMS, AND ABBREVIATIONS

A	
APE	Area Of Potential Effects
ADF&G	Alaska Department of Fish and Game
C	
Commission	Federal Energy Regulatory Commission
CVEA	Copper Valley Electric Association, Inc.
D	
DLA	Draft License Application
DSP	Draft Study Plan
F	
FERC	Federal Energy Regulatory Commission
FLA	Final License Application
FOIA	Freedom of Information Act
FSP	Final Study Plan
J	
JAM	Joint Agency Meeting
K	
kV	kilovolt
L	
Licensee	Copper Valley Electric Association, Inc.
N	
NOI	Notice of Intent
P	
PAD	Pre-Application Document
Project	Solomon Gulch Hydroelectric Project
T	
TLP	Traditional Licensing Process
U	
USFWS	United States Fish and Wildlife Service

1.0 INTRODUCTION

Copper Valley Electric Association, Inc. (CVEA or Licensee) is the Licensee, owner, and operator of the existing 12-megawatt Solomon Gulch Hydroelectric Project, Federal Energy Regulatory Commission (FERC) Project No. 2742 (Project). The Solomon Gulch Project is a major project located on Solomon Lake near Valdez, Alaska. The original license was issued on June 21, 1978, for a term of 50 years, expiring on May 31, 2028. CVEA is pursuing a new license for the Project using the FERC Traditional Licensing Process (TLP). CVEA submitted a Pre-Application Document (PAD) and Notice of Intent (NOI) on April 28, 2023.[1] A detailed description of the Project is provided in the PAD.

In the PAD, CVEA included a schedule of activities for the relicensing process, which includes the development and execution of a Study Plan in consultation with agencies and other interested parties. On November 20, 2023, CVEA filed a Draft Study Plan (DSP) with FERC,[2] which was distributed to stakeholders. The DSP outlined seven proposed studies to be conducted in 2024 as part of the relicensing process. Stakeholders were given 45 days to comment on the DSP. CVEA received comments from the Alaska Department of Fish and Game (ADF&G) and the United States Fish and Wildlife Service (USFWS) which were reviewed and incorporated into the Final Study Plan (FSP), filed with FERC on April 10, 2024.[3]

CVEA is submitting the following seven draft study reports to describe the results of the studies conducted in 2024:

- Water Temperature Monitoring Draft Study Report (Appendix A)
- Vegetation Characterization Draft Study Report (Appendix B)
- Rare and Sensitive Plant Draft Study Report (Appendix C)
- Invasive Plant Draft Study Report (Appendix D)
- Wildlife Habitat Evaluation Draft Study Report (Appendix E)
- Recreation Evaluation Draft Study Report (Appendix F)
- Cultural Resources Draft Study Report (Appendix G) – **Privileged (CUI//PRIV)**[4]

[1] FERC Accession Number 20230428-5508.
[2] FERC Accession Number 20231120-5091.
[3] FERC Accession Number 20240410-5151.
[4] The Cultural Resources Study Report contains sensitive and confidential cultural resource information and is being filed with the Commission as Privileged. This document has been labeled as CUI//PRIV—PRIVILEGED—DO NOT RELEASE.

2.0 PROJECT DESCRIPTION

The Project is located on Solomon Lake near Valdez, Alaska, as shown in Figure 2-1. The current Project Boundary includes: Solomon Gulch Reservoir (also known as Solomon Lake) and surrounding lands; the dam, saddle dike, spillway, penstocks, powerhouse, and associated appurtenant facilities; 1.68 miles of 24.9-kilovolt (kV) transmission line extending from the powerhouse switchyard to the Petro Star Switch Building at the Petro Star Valdez Refinery; and 108.16 miles of transmission line extending from the Petro Star Switch Building to the Meals Substation (where the volatge increases to 138 kV), and further to a substation adjacent to Pump Station 11 near Glennallen, Alaska.

The 108.16 miles of the transmission line is the subject of an ongoing license amendment proceeding for removal from the Project Boundary, as it no longer meets FERC's definition of a primary transmission line under the Federal Power Act (see Docket Number P-2742-038 in the FERC eLibrary). CVEA anticipates the Project lands associated with the transmission line and any associated study needs would be addressed and the FERC boundary modified under the amendment proceeding prior to the filing of the license application. Therefore, for purposes of describing study areas for the relicensing proceeding, CVEA is proposing study areas as depicted in Figure 2-1, which do not include the transmission line lands that are proposed for removal.

Land ownership within the current Project Boundary is a mix of federal, state, municipal, and privately owned lands. Additional information pertaining to the Solomon Gulch Project and its vicinity is provided in the PAD.[5]

[5] FERC Accession Number 20230428-5508.

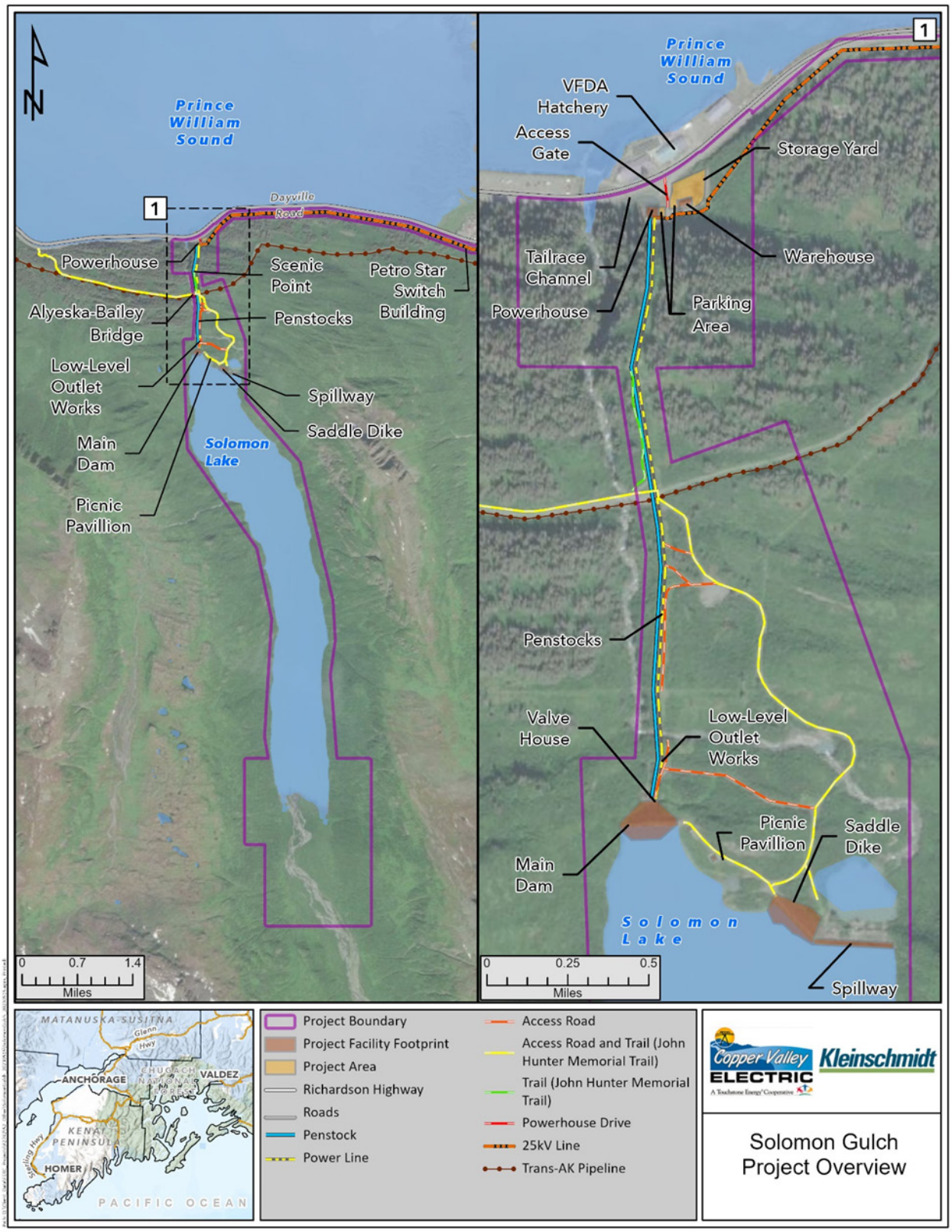

Figure 2-1 Solomon Gulch Project Overview

3.0 PROCESS AND SCHEDULE

3.1 Overall Process Plan and Schedule

Table 3-1 provides the Solomon Gulch Project TLP relicensing schedule for Stage II and III of the relicensing . The Stage I portion of the process was concluded with receipt of agency and stakeholder comments on the PAD and study requests from May 2023 to July 2024.

Table 3-1 Solomon Gulch Project Remaining Project Process, Plan, and Schedule

TLP Schedule	Timeframe	Estimated Date
Stage II		
Conduct First Season Studies		Summer 2024
Issue Draft Study Report		January 2025
TLP Stakeholder Comments on Study Reports/Meeting (if necessary)	60 days from DSR submittal	March 2025
Issue Final Study Report		April 2025
Conduct Second Season Studies (if necessary)		Summer 2025
Submit Draft License Application (DLA)	Approximately 150 days before FLA	December 30, 2025
Comments on DLA	90 days from DLA submittal	March 30, 2026
Dispute Resolution as Necessary		
Stage III		
Submit Final License Application (FLA)	At least 24 months prior to license expiration	May 31, 2026
License Expiration		May 31, 2028

Note: Blue shading indicates relicensing process steps that Copper Valley Electric Association plans to undertake for the Solomon Gulch Project but are not required by FERC's TLP regulations.

3.2 Collaboration Efforts to Date

Following the filing of the PAD and NOI on April 28, 2023, CVEA held a Joint Agency Meeting (JAM) and site visit on August 15, 2023, to give an overview of the Project, engage with stakeholders, and tour the Project area. State and federal resource agencies and other stakeholders were given 60 days following the JAM to provide comments on the PAD, provide comments on the proposed studies, and suggest additional studies that may be necessary to develop a complete environmental analysis for the relicensing of the Project. Comments on the PAD were received from the Alyeska Pipeline Company, Valdez Fisheries Development Association, and ADF&G.

On November 20, 2023, CVEA filed its DSP with seven proposed studies. State and federal resource agencies and other stakeholders were given 45 days to comment on the DSP, with comments due January 5, 2024. On April 10, 2024, CVEA filed its FSP, which represents the final relicensing studies and incorporates comments received from the ADF&G and USFWS.

CVEA requests stakholders provide comments to this Draft Study Report within 60 days of filing. If necessary, CVEA will hold a meeting to discuss the Draft Study Report results and stakholder comments. CVEA anticipates filing its Final Study Report in April 2025. CVEA will file its DLA no later than December 30, 2025.

On June 23, 2023, FERC initiated consultation under Section 106. On that same date, pursuant to 36 CFR § 800.2(c)(4) of the National Historic Presevation Act, FERC designated CVEA as the non-federal representative for informal consultation for relicensing the Solomon Gulch Project. On June 10, 2024, CVEA requested concurrence from the Alaska State Historic Preservation Officer (SHPO) on the Area Of Potential Effects (APE). On July 11, 2024, Alaska SHPO provided its concurrence on the APE.[6]

CVEA will continue to consult with interested parties throughout the relicensing process, consistent with the Process Plan and Schedule outlined in Section 2 of the PAD.

[6] FERC Accession Number 20250124-5084.

4.0 STUDY STATUS

4.1 Water Temperature Monitoring Study

The Water Temperature Monitoring Study (Appendix A) was a one-year study that has successfully met all the objectives outlined in the FSP and is now complete. Specifically, the study characterized water temperature in Solomon Gulch Creek and in the Project tailrace.

No additional or future water temperature monitoring studies are proposed.

4.2 Vegetation Characterization Study

The Vegetation Characterization Study (Appendix B) was a one-year study that has met all the objectives outlined in the FSP and is now complete. Specifically, the study mapped vegetation types, wetlands, and wildlife habitat types using established classification systems, incorporating both vegetation structure and relevant landscape features.

No additional or future vegetation characterization studies are proposed.

4.3 Rare and Sensitive Plant Study

The Rare and Sensitive Plant Study (Appendix C) was a one-year study that has met all the objectives outlined in the FSP and is now complete. Specifically, the study documented the locations and sizes of rare and sensitive plant species in the Project area.

No additional or future rare and sensitive plant studies are proposed.

4.4 Invasive Plant Study

The Invaside Plant Study (Appendix D) was a one-year study that has met all the objectives outlined in the FSP and is now complete. Specifically, the study provided an assessment of invasive plants within the Project area.

No additional or future invasive plant studies are proposed.

4.5 Wildlife Habitat Evaluation Study

The Wildlife Habitat Evaluation Study (Appendix E) was a one-year study that has met all the objectives outlined in the FSP and is now complete. Specifically, this study aimed to identify wildlife species of concern (birds and mammals) in the study area and assess the importance of habitats for those species.

No additional or future wildlife habitat evaluation studies are proposed.

4.6 Recreation Evaluation Study

The Recreation Evaluation Study (Appendix F) was a one-year study that has met all the objectives outlined in the FSP and is now complete. Specifically, this study provided an assessment of the Project's recreation site, visitor use, available recreation opportunities within the Project Boundary, and the need for additional recreational resources.

No additional or future recreation studies are proposed at this time.

4.7 Cultural Resources Study - Privileged

In July 2024, a Phase I survey of the Solomon Gulch Project APE was conducted. This study has met all the objectives outlined in the FSP and is now complete. This study report (Appendix G) is filed as Privileged.

No additional or future cultural studies are proposed at this time.

APPENDIX A

WATER TEMPERATURE MONITORING DRAFT STUDY REPORT

WATER TEMPERATURE MONITORING DRAFT STUDY REPORT

SOLOMON GULCH HYDROELECTRIC PROJECT
FERC NO. 2742

Submitted by:

Copper Valley Electric Association
Valdez, Alaska

Prepared by:

Kleinschmidt Associates

January 2025

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DEFINITIONS OF TERMS, ACRONYMS, AND ABBREVIATIONS

#	
7-DADMax	7-day average of the daily max
°C	degrees Celsius
A	
ADEC	Alaska Department of Environmental Conservation
C	
CVEA	Copper Valley Electric Association
D	
DSP	Draft Study Plan
F	
FERC	Federal Energy Regulatory Commission
FSP	Final Study Plan
P	
PAD	Pre-Application Document
Project	Solomon Gulch Hydroelectric Project
Q	
QA/QC	quality assurance/quality control
S	
Solomon Gulch Project	Solomon Gulch Hydroelectric Project

1.0 INTRODUCTION

Copper Valley Electric Association, Inc. (CVEA or Licensee) is the Licensee, owner, and operator of the existing 12-megawatt Solomon Gulch Hydroelectric Project, Federal Energy Regulatory Commission (FERC) Project No. 2742 (Project). The Solomon Gulch Project is a major project located on Solomon Lake near Valdez, Alaska. The original license was issued on June 21, 1978, for a term of 50 years, and expires on May 31, 2028. CVEA is pursuing a new license for the Project using the FERC Traditional Licensing Process. CVEA submitted a Pre-Application Document (PAD) and Notice of Intent on April 28, 2023.[1] A detailed description of the Solomon Gulch Project is provided in the PAD.

On November 20, 2023, CVEA filed a Draft Study Plan (DSP) with FERC[2] and distributed it to stakeholders. The DSP outlined seven studies proposed to take place in summer 2024 as part of the relicensing process. CVEA filed the Final Study Plan (FSP) with FERC on April 10, 2024 (CVEA 2024).[3]

This report describes the results of the Water Temperature Monitoring Study, which was conducted following methods described in the FSP.

[1] FERC Accession Number 20230428-5508.
[2] FERC Accession Number 20231120-5091.
[3] FERC Accession Number 20240410-5151.

2.0 STUDY AREA

The study area for the Water Temperature Monitoring Study consists of Solomon Gulch Creek downstream of the Spillway Creek confluence and the tailrace below the powerhouse (Figure 2-1).

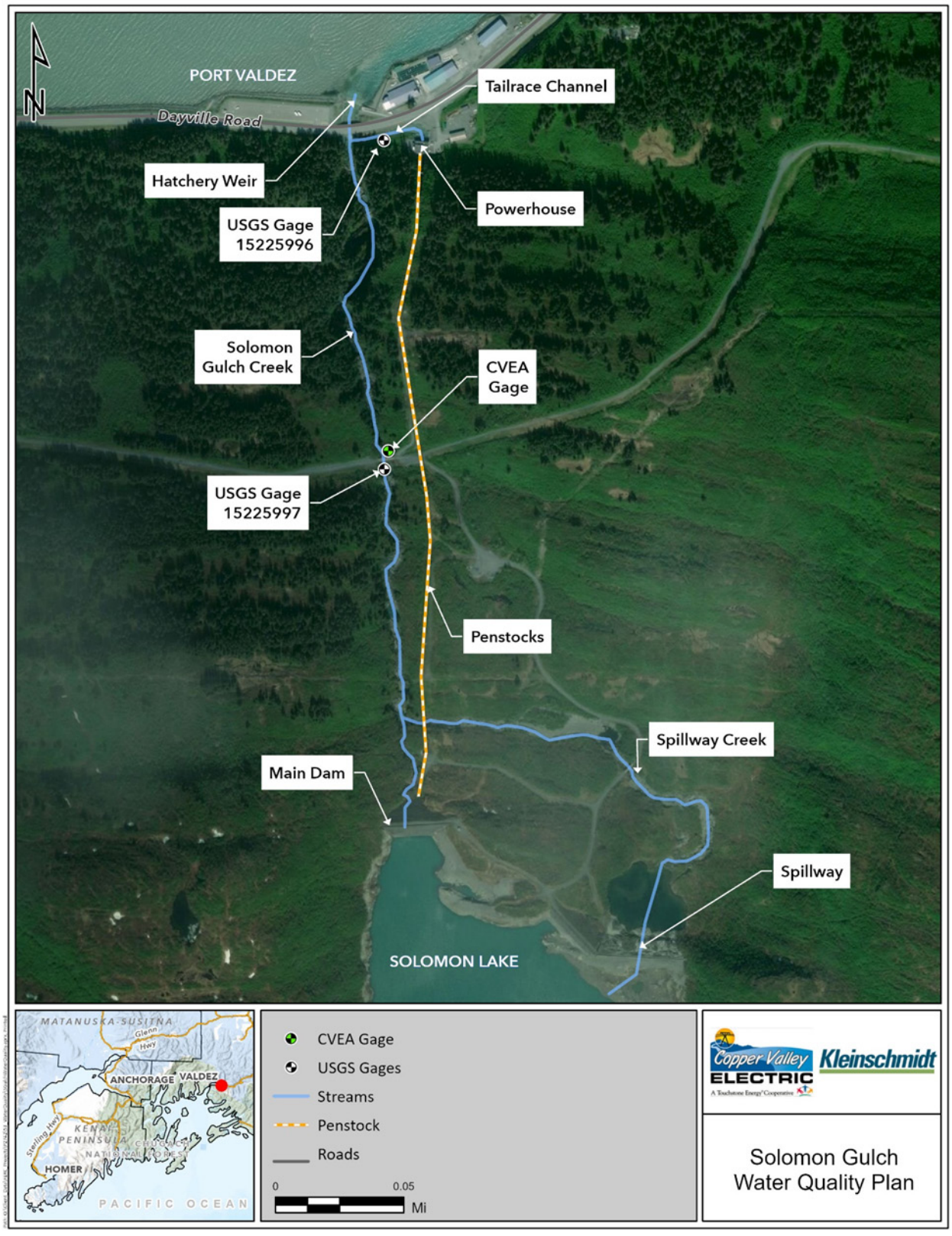

Figure 2-1 Water Temperature Monitoring Study Area

3.0 GOALS AND OBJECTIVES

The goal of the Water Temperature Monitoring Study was to characterize water temperatures in fish habitats with the potential to be affected by the operation of the Solomon Gulch Project.

The specific objectives of the study were to:

- characterize water temperature in Solomon Gulch Creek, and
- characterize water temperature in the Project tailrace.

3.1 Alaska State Water Quality Criteria

Criteria for relevant water quality parameters are summarized in Table 3-1.

Table 3-1 Water Quality Standards for Alaska Fresh Water Uses

Pollutant	Criteria*
Temperature	May not exceed 20°C at any time. The following maximum temperatures may not be exceeded where applicable: Migration routes: 15°C Spawning areas: 13°C Rearing areas: 15°C Egg and fry incubation: 13°C For all other waters, the weekly average temperature may not exceed site-specific requirements needed to preserve normal species diversity or to prevent appearance of nuisance organisms.

Source: ADEC (2022).

*The water quality standards listed in this table include the criteria for the growth and propagation of fish, shellfish, other aquatic life, and wildlife.

4.0 STUDY SCOPE AND METHODOLOGY

Characterizing water temperatures for fish habitat in the Solomon Gulch basin will support resource management goals related to water quality as well as fish and wildlife habitat protection. Project operations have the potential to increase water temperatures in downstream waters, which in turn could impact aquatic resources.

4.1 Methods

Monitoring locations, schedule, procedures, and analytical methods are summarized below.

4.1.1 Monitoring Locations

Water temperature monitoring was conducted in the powerhouse tailrace (Photo 1 and Photo 2) and at the new CVEA-installed gage on Solomon Gulch Creek (Photo 3, Figure 4-1). This configuration of monitoring locations will support evaluation of water temperatures in the stream reaches downstream of Solomon Lake with potential fish habitat.

Photo 1 Two thermistors installed in the Project tailrace attached to historic U.S. Geological Survey monitoring cable

Photo 2 Project tailrace, looking downstream from powerhouse

Photo 3 Thermistors attached to historic U.S. Geological Survey monitoring cable in Solomon Gulch Creek upstream of Bailey Bridge

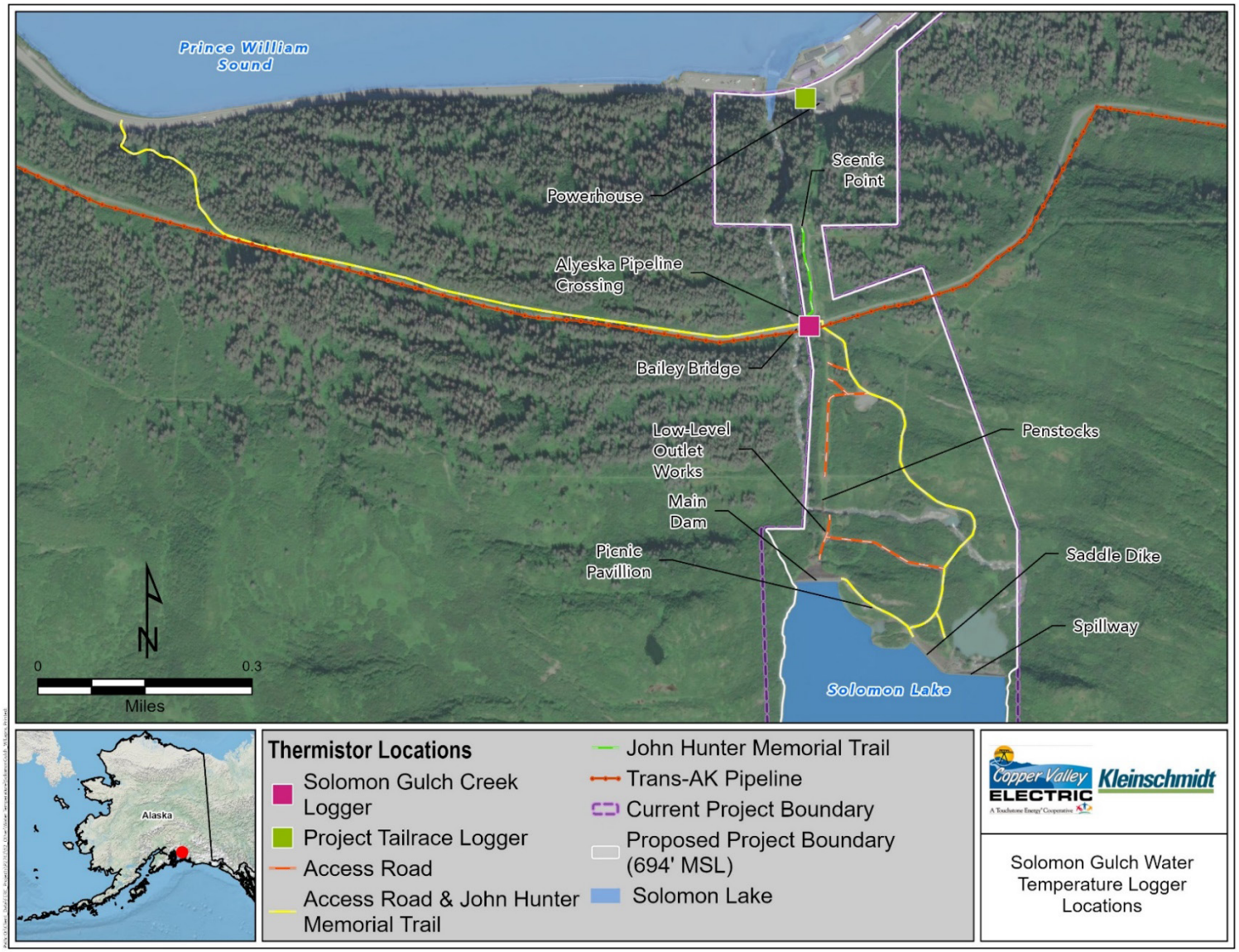

Figure 4-1 Water Temperature Monitoring Locations

4.2 Monitoring Schedule

Water temperature monitoring was conducted June 27 through October 31, 2024 (Table 4-1). Monitoring data was downloaded monthly at both sites. However, at the first monthly download, the Solomon Gulch Creek loggers had been washed away, with the anchoring cable likely eroded by water or potentially disturbed by an animal. New thermistors were immediately ordered and installed five days later on July 31, 2024 (Photo 4). To minimize the risk of data loss, monitoring sites were visited to download data from the loggers at least twice per month for the remainder of the study period.

Table 4-1 Solomon Gulch Project Water Temperature Monitoring Schedule

Date	Project Tailrace			Solomon Gulch Creek		
	Installation	Data Download	Removal	Installation	Data Download	Removal
06/27/2024	X			X		
07/26/2024		X				
07/31/2024				X		
08/06/2024		X			X	
08/20/2024		X			X	
09/04/2024		X			X	
09/11/2024		X			X	
10/02/2024		X			X	
10/09/2024		X			X	
10/31/2024		X	X		X	X

Photo 4 Thermistor replacement installation in Solomon Gulch Creek on July 31, 2024

4.3 Monitoring Equipment and Procedures

In accordance with the data standards outlined in Mauger et al. (2015), continuous, calibrated loggers recorded water temperature measurements at 15-minute intervals. Loggers were visited monthly to download data, with two loggers recording data per site for redundancy. Onset Hobo MX2203 and MX2205 temperature loggers were capable of accuracy ±0.2°C for temperatures between −40°C and 50°C in water. Pre- and post-deployment accuracy checks were used to screen for defective equipment and qualify data reporting if measurement drift occurred. Accuracy checks were conducted at two temperatures (approximately 0°C and 20°C).

Records of accuracy checks and calibration events were maintained. Metadata recorded on field data sheets during logger installation and downloading events included a unique site identifier, datum, latitude and longitude, date, and time. Data were subjected to rigorous quality assurance/quality control (QA/QC) procedures, and subsequently entered and managed in Microsoft Excel and RStudio. Daily summaries of minimum, maximum, and mean stream temperatures were calculated for days within the monitoring period that contained at least 90 percent of the 15-minute data for that day (i.e., 87 of the 96 15-minute measurements). In addition, the 7-day average of the daily max (7-DADMax) was calculated.

5.0 STUDY RESULTS AND DISCUSSION

Water temperature data collected in 2024 is summarized below.

5.1 Temperature

Water temperatures in July through October 2024 in the Project tailrace and in Solomon Gulch Creek were relatively low, with temperatures measuring less than 13°C for the entire sampling period (Figure 5-1). The Project tailrace monitoring characterized 125 complete days of water temperature recorded at 15-minute intervals. Water temperatures ranged between 2.95°C and 8.45°C (Figure 5-2). Peak water temperatures were observed on September 15, 2024.

Solomon Gulch Creek monitoring characterized 93 complete days of water temperature recorded at 15-minute intervals. Water temperatures ranged between 1.38°C to 12.86°C (Figure 5-3). Peak water temperatures were observed on August 5, 2024. Although the temperature loggers were lost due to a broken anchoring cable, the pattern of temperature over the remaining monitoring period suggested that the peak temperatures for the year were captured.

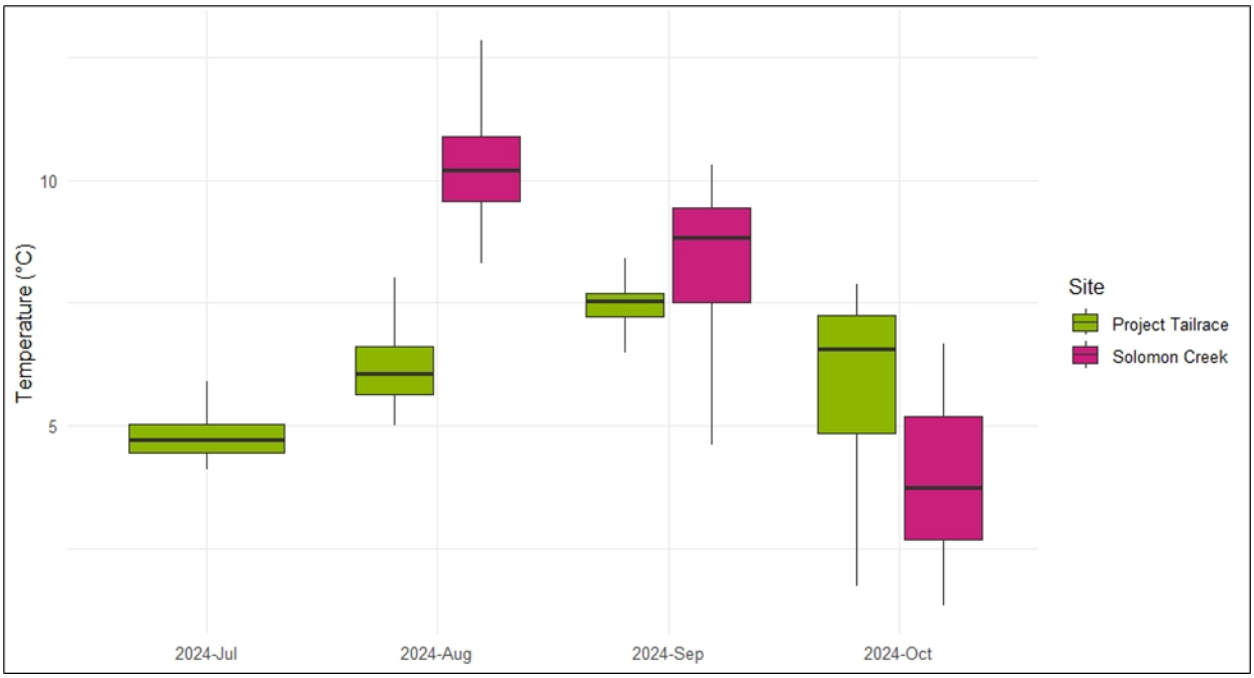

Figure 5-1 Distribution of Water Temperatures by Month in Solomon Gulch Creek and the Project Tailrace, 2024

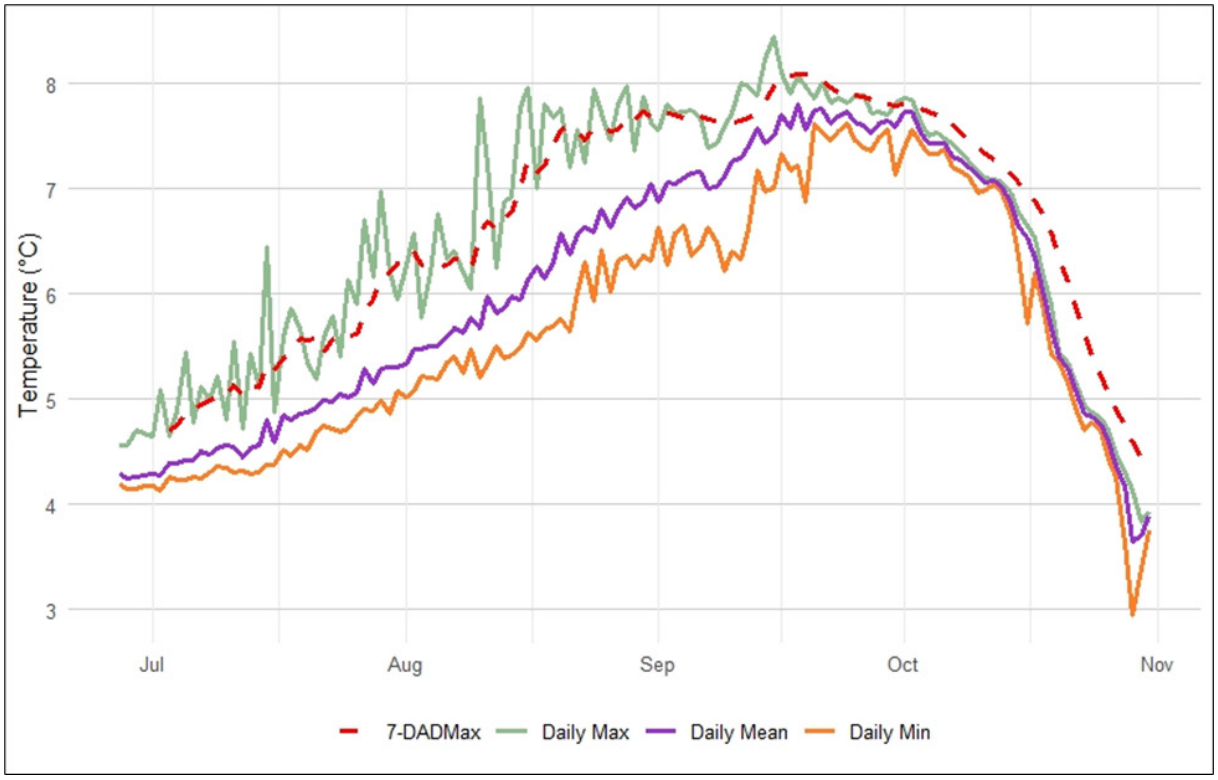

Figure 5-2 Water Temperature in the Project Tailrace, 2024

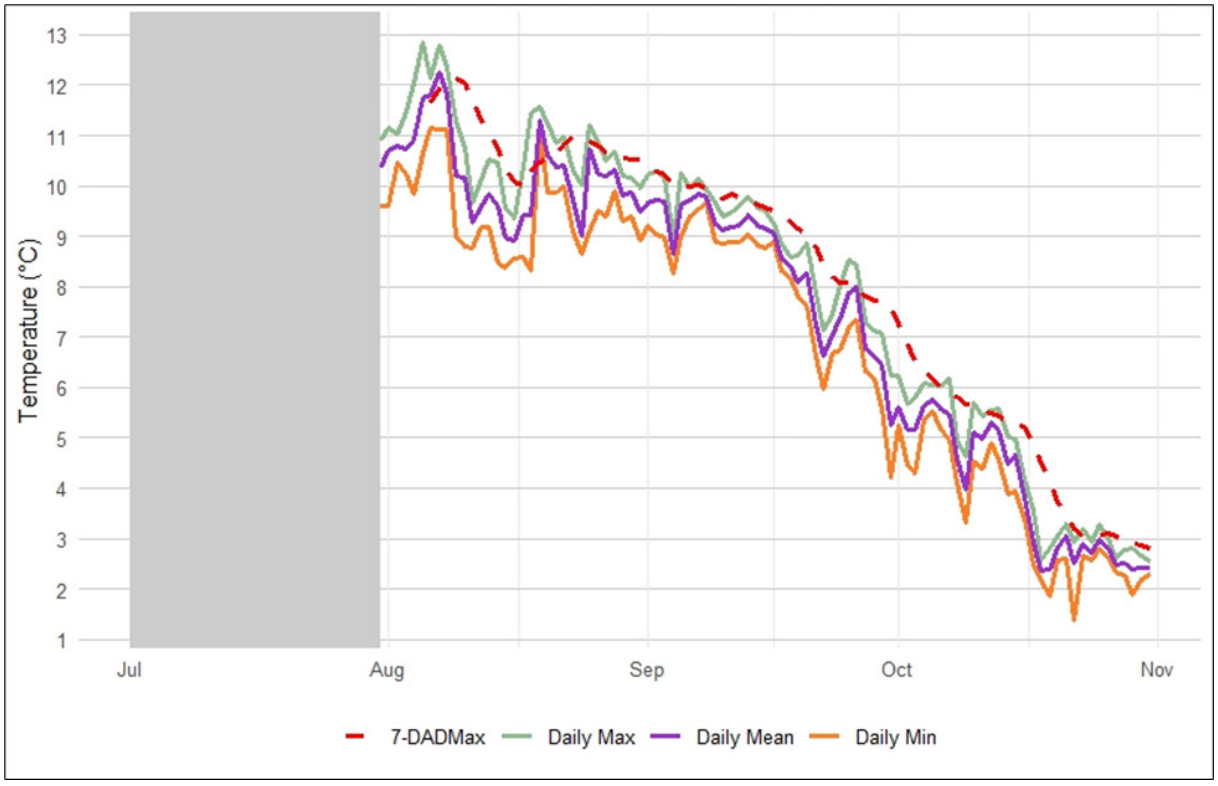

Figure 5-3 Water Temperature in Solomon Gulch Creek, 2024

5.1.1 Compliance with Water Quality Standards

Water temperature criteria for the growth and propagation of fish, shellfish, other aquatic life, and wildlife include criteria for various uses at temperature thresholds of 13°C, 15°C, and 20°C (Table 3-1). Water temperatures recorded in the Project tailrace and Solomon Gulch Creek met all temperature criteria for spawning, rearing, and migration routes (Table 5-1).

Table 5-1 Number of Days Daily Maximum Temperature Exceeded Water Temperature Criteria

Criterion	Fish Use	Number of Days Exceeding	
		Project Tailrace	Solomon Gulch Creek
<13 °C	Spawning areas, egg & fry incubation	0	0
<15 °C	Migration routes, rearing areas	0	0
<20 °C	Growth and propagation of fish, shellfish, other aquatic life, and wildlife	0	0

5.2 Discussion

The general pattern of water temperature in Solomon Gulch Creek was higher than the water temperature in the Project tailrace, with peak temperatures occurring earlier in the year. At both sampling locations, water temperatures did not exceed 13°C as is required to support fish spawning, specifically egg and fry incubation, 15°C as is needed for rearing areas and migration routes, or 20°C for the growth of fish, shellfish, other aquatic life, and wildlife. High flow conditions in Solomon Gulch Creek elevated the risk of logger anchor failure; more frequent site visits minimized the risk of data loss.

6.0 STUDY VARIANCES AND MODIFICATIONS

For this study, there was a variance from the procedures outlined in the FSP due to the loss of temperature data, from installation to July 31, 2024, which is described in Section 4.2 of this study report.

7.0 STUDY SPECIFIC CONSULTATION

On November 20, 2023, CVEA filed its DSP developed for the relicensing of the Project. Stakeholders were provided 45 days to comment on the DSP. Following the comment period, CVEA filed the FSP with FERC on April 10, 2024. No comments were provided for this Water Temperature Monitoring Study.

This Water Temperature Monitoring Draft Study Report is being distributed to relicensing participants for a 60-day review period. After the review period, CVEA will update the report based on comments received, and file the final report with FERC.

8.0 SUMMARY

This was a single-year study; the study has met all objectives outlined in the FSP and is complete. No additional or future water temperature monitoring studies are proposed.

9.0 REFERENCES

Alaska Department of Environmental Conservation (ADEC). 2022. Water Quality Standards. Amended November 13, 2022. Alaska Administrative Code Chapter 70 (18 Alaska Administrative Code 70).

Copper Valley Electric Association, Inc. (CVEA). 2024. Final Study Plan, Solomon Gulch Hydroelectric Project, FERC No. 2742. Prepared by Kleinschmidt. 20 pp. + appendices.

Mauger, S., R. Shaftel, E. J. Trammell, M. Geist, and D. Bogan. 2015. Stream Temperature Data Collection Standards for Alaska: Minimum Standards to Generate Data Useful for Regional-scale Analyses. Journal of Hydrology: Regional Studies, 4, pp.431-438.

APPENDIX B

VEGETATION CHARACTERIZATION DRAFT STUDY REPORT

ATTACHMENT B

MAP VERIFICATION PLOTS

VEGETATION CHARACTERIZATION DRAFT STUDY REPORT

SOLOMON GULCH HYDROELECTRIC PROJECT
FERC NO. 2742

Submitted by:

Copper Valley Electric Association
Valdez, Alaska

Prepared by:

ABR, Inc.—Environmental Research & Services
Anchorage, Alaska

January 2025

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DEFINITIONS OF TERMS, ACRONYMS, AND ABBREVIATIONS

A

ABR	ABR, Inc.—Environmental Research & Services
AVC	Alaska Vegetation Classification

C

CVEA	Copper Valley Electric Association, Inc.

D

DGGS	(Alaska) Division of Geological & Geophysical Surveys
DSP	Draft Study Plan

E

ELS	Ecological Land Survey

F

FERC	Federal Energy Regulatory Commission
FGDC	Federal Geographic Data Committee
FSP	Final Study Plan

I

ITU	Integrated Terrain Unit

N

NHD	National Hydrography Dataset
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory

P

Project	Solomon Gulch Hydroelectric Project
PAD	Pre-Application Document

S

Solomon Gulch Project	Solomon Gulch Hydroelectric Project

U

USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

1.0 INTRODUCTION

Copper Valley Electric Association, Inc. (CVEA or Licensee) is the Licensee, owner, and operator of the existing 12-megawatt Solomon Gulch Hydroelectric Project (Project), Federal Energy Regulatory Commission (FERC) Project No. 2742. The Solomon Gulch Project is a major project located on Solomon Lake near Valdez, Alaska. The original license was issued on June 21, 1978, for a term of 50 years, and expires on May 31, 2028. CVEA is pursuing a new license for the Project using the FERC Traditional Licensing Process. CVEA submitted a Pre-Application Document (PAD) and Notice of Intent on April 28, 2023.[1] A detailed description of the Solomon Gulch Project is provided in the PAD.

On November 20, 2023, CVEA filed a Draft Study Plan (DSP) with FERC[2] and distributed it to stakeholders. The DSP outlined seven studies proposed to take place in summer 2024 as part of the relicensing process. CVEA filed the Final Study Plan (FSP) filed with FERC on April 10, 2024 (CVEA 2024).[3]

This report describes the results of the Vegetation Characterization Study, which was conducted following methods described in the FSP. Variances to the study are described in Section 6.0. No vegetation map had previously been prepared for the Solomon Gulch Project area (CVEA 2023). The Vegetation Characterization Study was designed to address this data gap and to provide mapping information for wetlands and wildlife habitats. Existing National Wetlands Inventory (NWI) wetland mapping for the Project area is outdated (U.S. Fish and Wildlife Service [USFWS] 1978) and does not provide information on the additional landscape features needed to map wildlife habitats. The mapping of wildlife habitats in the Vegetation Characterization Study was used in conjunction with the Wildlife Habitat Evaluation Study (Draft Study Report, Appendix E) to provide information on the expected occurrence and habitat use of wildlife species of concern in the Project area.

[1] FERC Accession Number 20230428-5508.
[2] FERC Accession Number 20231120-5091.
[3] FERC Accession Number 20240410-5151.

2.0 STUDY AREA

The study area for the Vegetation Characterization Study encompasses the Project boundaries, as depicted in Figure 2-1, and the portion of the John Hunter Memorial Trail between Dayville Road and the Project Boundary which serves as the Project's access road. Mapping for the Vegetation Characterization Study also includes a 250-meter (820-foot) buffer zone surrounding the Project Boundary and access road to place the resulting map data within a local landscape context.

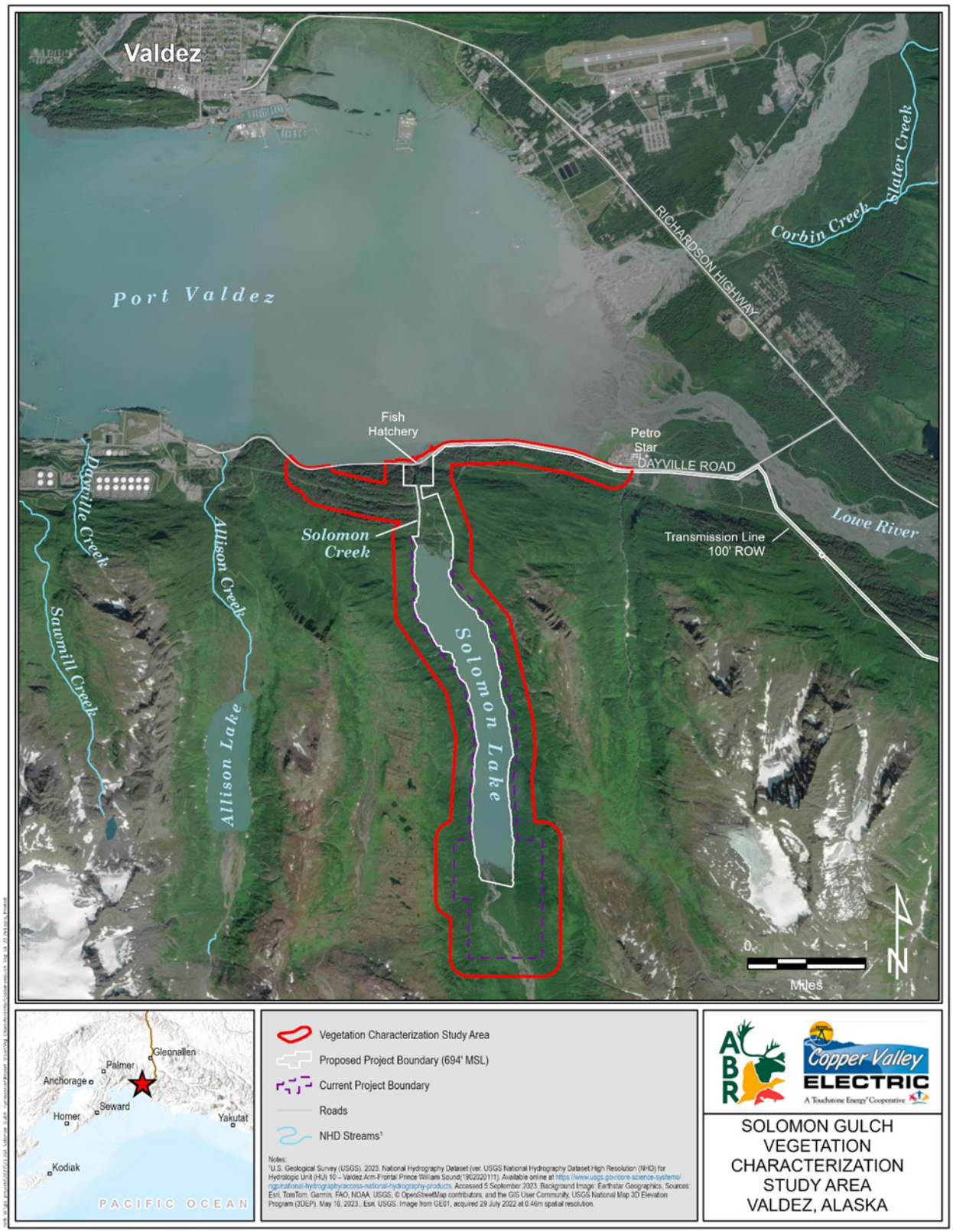

Figure 2-1 Vegetation Characterization Study Area

3.0 GOALS AND OBJECTIVES

The goal of the Vegetation Characterization Study is to develop current data on the occurrence and extent of vegetation, wetlands, and wildlife habitats in the Project area. This information will be used to assess possible impacts of Project operations on wetland and wildlife resources in the Project area. The wetland map data may also be useful in discussions with FERC and the Bureau of Land Management regarding CVEA's proposal to reduce the Project Boundary around the reservoir to the area necessary for Project operations—that area encompasses the probable maximum flood at an elevation of 694 feet above mean sea level. The information on wildlife habitat types is used in conjunction with the Wildlife Habitat Evaluation Study (Draft Study Report, Appendix E) to provide the data needed to assess possible impacts to wildlife habitats that could occur from Project operations.

The specific objectives of the Vegetation Characterization Study are to:

- Map vegetation types to Level IV of the Alaska Vegetation Classification (AVC; Viereck et al. 1992), which includes information on both vegetation structure and plant communities.
- Map wetland types following the USFWS NWI classification system (Federal Geographic Data Committee [FGDC] 2013), which is the system used by the U.S. Army Corps of Engineers (USACE) in the federal wetland permitting process.
- Map wildlife habitat types using a combination of vegetation type and other landscape features important to wildlife, including physiography, surface form, microtopography, and disturbance type.

4.0 STUDY SCOPE AND METHODOLOGY

Vegetation in the study area was mapped at Level IV of the AVC (Viereck et al. 1992) by reviewing and interpreting recent aerial photography and satellite imagery (see Section 4.3.1 below). Detailed field ground reference data collected during summer 2024 were used to link vegetation information and other landscape data to photo-signatures on the imagery and to facilitate identification and delineation of vegetation and wildlife habitat types.

Wildlife habitats were mapped using an integrated approach based on Integrated Terrain Unit (ITU) mapping methods developed for Ecological Land Surveys (ELS). Over the past several decades, ELS studies have been conducted in tundra, boreal forest, and coastal regions in Alaska (see Jorgenson et al. 2003 for an example in Southcentral Alaska). The ITU approach involves mapping individual terrain units such as vegetation type, physiography, surface form, and disturbance type, and combining them into composite units which describe the range of land cover variation in the study area. When deriving wildlife habitats, the composite ITUs are aggregated into a smaller set of ecologically important categories that emphasize habitat features known to be important for wildlife species that use the study area (see Section 4.3.2 below).

This study was conducted in close coordination with the Rare and Sensitive Plant Study (Draft Study Report, Appendix C) and Invasive Plant Study (Draft Study Report, Appendix D) In the field, data were collected as applicable for all three botanical studies at each sampling plot.

4.1 Develop Mapping Materials from Historical and Current Data

All available historical and current GIS data layers with potential value for mapping vegetation and wildlife habitats in the study area were compiled for use in this study. No U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) soil survey data are available for the study area through the Web Soil Survey (USDA NRCS 2024), but the following data were located and compiled:

- High-resolution satellite imagery (GEO1, 0.46-meter resolution, acquired July 29, 2022) available through the Environmental Systems Research Institute, Inc. World Imagery basemap.

- Elevation hillshade from 2012 Valdez Light Detection and Ranging data, available through the Alaska Division of Geological & Geophysical Surveys Elevation Portal (Alaska DGGS 2024).
- National Hydrography Dataset (NHD) lines and polygons for waterbodies (U.S. Geological Survey [USGS] 2019).
- Alaska Department of Fish and Game Anadromous Waters Catalog information on anadromous fish-bearing streams (ADF&G 2024).
- Historical wildlife habitat and wetland mapping for the adjacent Allison Lake hydroelectric project (ABR, Inc.—Environmental Research & Services [ABR] 2011a, 2011b).

4.2 Field Surveys

To verify the photointerpretation of landscape features and ITU variables during the mapping work for this study, ground reference data were collected July 15-17, 2024. Preliminary desktop ITU mapping was prepared in advance of the field surveys to guide the allocation of sampling points in the study area. Sampling plots were located along transects in each of the major physiographic types in the study area, including riverine, lacustrine, upland, subalpine, and coastal areas. Transect starting and end points were limited to accessible areas via either helicopter or automobile along Project area roads.

A team of two scientists from ABR, 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 10 meters (33 feet), 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. 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. Soils characteristics

germane to characterizing wildlife habitats (depth of surface organic horizons, dominant mineral soil texture, moisture regime) was recorded at full ground reference plots. 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 at each plot, 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.

Although standard USACE wetland determination data forms were not completed for this Vegetation Characterization Study, each full plot was assigned a likely wetland type using NWI notation (FGDC 2013), which is the approach typically used by the USFWS NWI program (Dahl et al. 2020).

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, NWI wetland type and water regime class, site photos, and GPS coordinates. No soils information was recorded at map verification plots.

To support the survey efforts of other botanical and wildlife studies being conducted for the Project, the locations of any observations of rare or invasive plants, notable wildlife sightings, or wildlife sign were recorded when encountered.

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 wetland 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 wetland map.

4.3 ITU Mapping and Deriving Wildlife Habitats

4.3.1 ITU Mapping

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 satellite imagery (see Section 4.1). The verification of landscape features and ITU variables during the photointerpretation process was supported by ground reference survey data collected during summer 2024 (see Section 4.2). All mapping was conducted at a scale of 1:5,000 and the minimum mapping polygon size was 0.5 acre. Each map polygon was assigned the following ITU attributes:

- Vegetation type/land cover class—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).
- Physiography class—broad, landscape-scale geomorphic features and landscape position (e.g., riverine, lacustrine, lowland, upland, subalpine, alpine).
- Surface form class—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 and observed during the field survey, but were difficult to detect on the satellite imagery, 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. When possible, the specific locations of these streams were based on features visible in satellite imagery and the elevation hillshade.

4.3.2 Deriving 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. First, all combinations of physiography and vegetation type were compiled, which resulted in 32 ITU code combinations. Those composite ITU classes were then aggregated into a final

set of 17 wildlife habitat 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 are used directly in the Wildlife Habitat Evaluation Study (Draft Study Report, Appendix E), 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 set of bird, mammal, and amphibian species of concern that are assessed in the habitat evaluations.

5.0 STUDY RESULTS AND DISCUSSION

The field survey was completed in July 2024, and ITU mapping of the study area was completed in September 2024. A total of 252 map polygons were delineated within the 2,595-acre study area. Sixteen vegetation and land cover classes were mapped, and 17 wildlife habitat types were derived from the mapped ITU variables. Field survey and mapping results are presented below.

5.1 Field Survey

The Vegetation Characterization Study field survey was conducted from July 15-17, 2024. A total of 21 full ground reference plots (Attachment A) and 10 map verification plots (Attachment B) were sampled (Table 5-1, Figure 5-1). Plots were sampled in all five physiography types and a total of 18 vegetation and landcover classes, ranging from barren and partially vegetated to forested areas. 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.

Table 5-1 Vegetation and Land Cover Classes Sampled in the Solomon Gulch Wildlife Habitat Study Area, Solomon Gulch, 2024.

Vegetation/Land Cover Class	Full Ground Reference Plots	Map Verification Plots
Needleleaf Forest	**2**	**0**
Closed Sitka Spruce-Western Hemlock Forest	1	
Closed Sitka Spruce Forest	1	
Tall Scrub	**7**	**2**
Closed Tall Alder Scrub	1	
Closed Tall Alder-Willow Scrub	2	
Open Tall Alder Scrub	1	1
Open Tall Alder-Willow Scrub	3	1
Low Scrub		
Open Low Alder-Willow Scrub	1	
Herbaceous	**8**	**2**
Alpine Herbs	1	
Mixed Herbs	3	
Subarctic Lowland Herb Bog Meadow		1
Subarctic Lowland Sedge Bog Meadow	1	
Subarctic Lowland Grass Wet Meadow	1	
Subarctic Lowland Sedge Wet Meadow	1	
Halophytic Herb Wet Meadow		1
Halophytic Sedge Wet Meadow	1	
Other	**2**	**6**
Partially Vegetated (5–30% vegetation cover)	2	
Fresh Water		5
Marine Water		1
Total	**21**	**10**

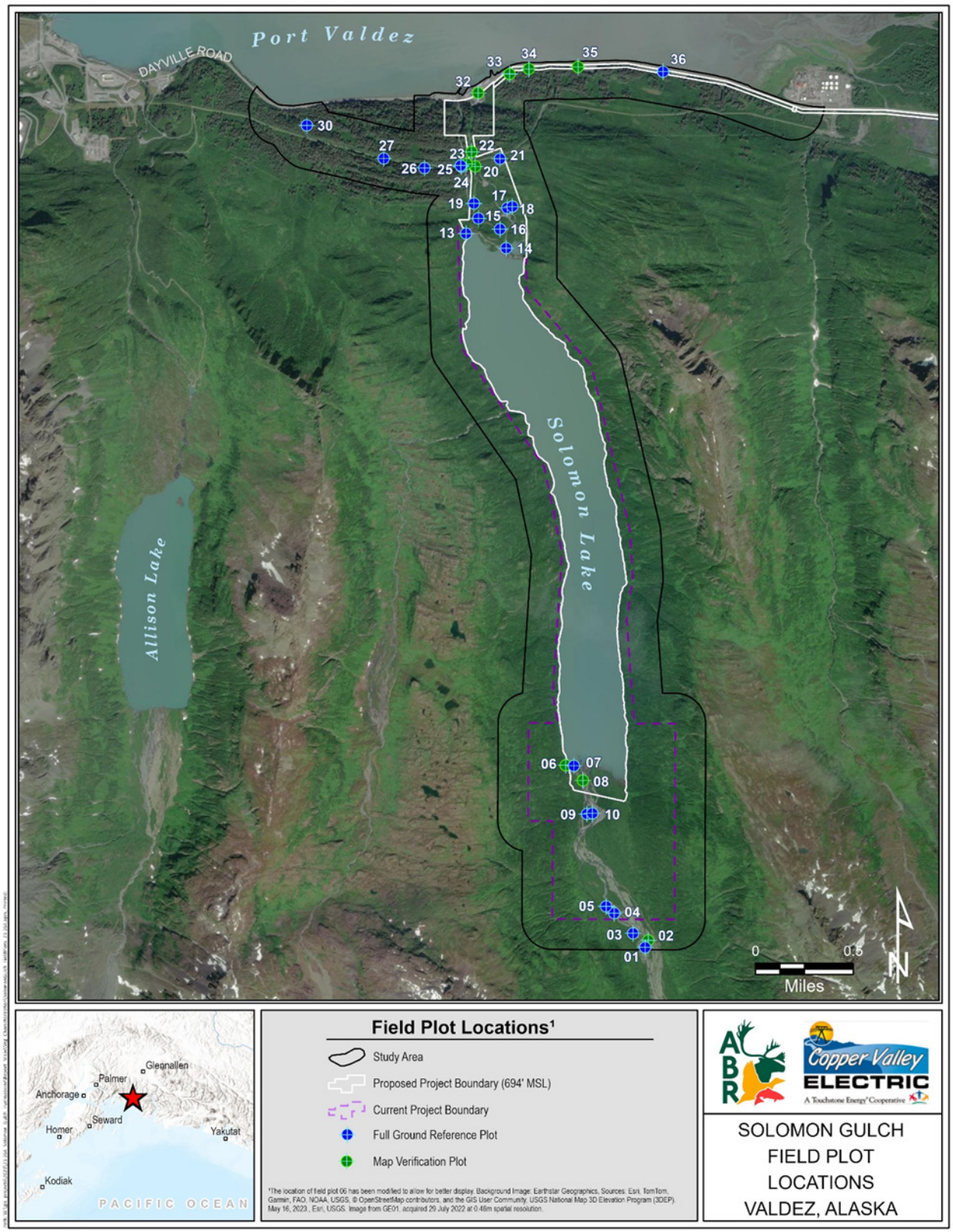

Figure 5-1 Field Plot Locations in the Vegetation Characterization Study Area

5.2 Physiography

Five physiography types were mapped in the study area and are described in Table 5-2. Subalpine physiography occurs above tree line and is characterized by both low and tall shrub thickets and openings of dwarf scrub and forb-dominated meadows. Upland physiography occurs below tree line. Upland physiography is characterized by water-shedding terrain, typically having convex slopes or flat sloping areas, and is usually, but not always, well-drained. Lacustrine physiographic areas are dominated by lacustrine processes (lakes and ponds and associated areas where the hydrology is largely controlled by the adjacent water body). Riverine physiographic areas include rivers and streams and associated areas that are influenced by riverine processes, the most important of which are flood events. Coastal physiography includes intertidal and supratidal substrates that are regularly influenced by saltwater, such as beaches, tidal flats, spits, and lagoons. Some of these environments are frequently inundated by tides, while others are affected by saltwater only during storm surges.

Overall, the study area is dominated by subalpine physiography, which comprises nearly 50 percent of the mapped area (Table 5-2, Figure 5-2). Lacustrine and upland physiography are the next most common classes, encompassing over 20 percent of the study area each. Riverine and coastal physiography are much more limited within the study area, encompassing 6.4 and 0.3 percent of the study area, respectively.

Table 5-2 Physiographic Types Mapped in the Solomon Gulch Project area.

Physiography	Characteristics	Area Mapped (acres)[1]	Percent of Study Area[1]
Subalpine	Defined by elevation and corresponding lack of trees; tall and low shrubs are typically present; often steeply sloping.	1,272.5	49.0
Upland	Water-shedding terrain; typically well-drained, dry to moist mineral soils; often located on slopes.	552.7	21.3
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.	595.7	23.0
Riverine	More than just a proximal relationship with rivers and streams; riverine communities show evidence of influence by riverine processes, particularly hydrology.	165.6	6.4
Coastal	Intertidal and supratidal substrates that are regularly influenced by saltwater.	8.9	0.3
	Total	**2,595.4**	**100.0**

[1] Values rounded to one decimal place.

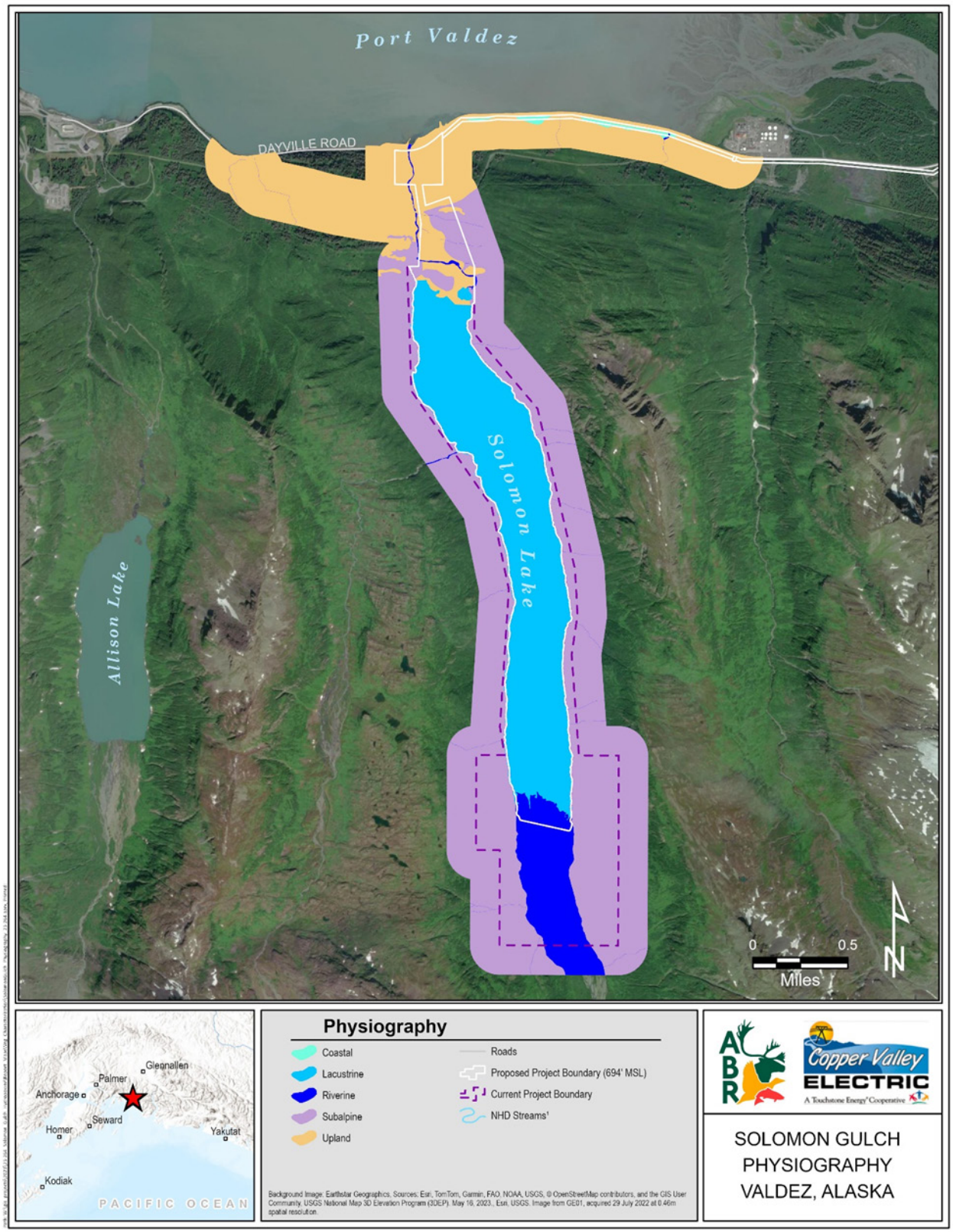

Figure 5-2 Physiography in the Vegetation Characterization Study Area

5.3 Vegetation and Surface Form

The 16 vegetation and land cover classes mapped in the study area and the acreage occupied by each are listed in Table 5-3. The 16 classes are comprised of 2 forested classes, 2 tall scrub classes, 2 low scrub classes, 1 dwarf shrub class, 6 communities dominated by herbaceous (non-woody) plants, and 3 partially vegetated or non-vegetated classes. 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). Overall, the study area is strongly dominated by tall scrub and forested vegetation types; herbaceous-dominated vegetation is much less prevalent (Table 5-3, Figure 5-3).

Each vegetation class polygon was assigned a representative surface form. A total of 10 surface forms were mapped in the study area: basins or depressions; drainage, no visible water; fluvial bar; human modified, infrastructure; lake margins; river or stream, variable water; undifferentiated slope; lower slope; toe slope; persistent waterbodies.

Table 5-3 Alaska Vegetation Classification (Level IV) vegetation types in the Solomon Gulch Project area.

Vegetation/Land Cover Class	Physiographic Occurrence	Area Mapped (acres)[1]	Percent of Study Area[1]
Needleleaf Forest			
Closed Sitka Spruce Forest	Upland	301.2	11.6
Open Sitka Spruce Forest	Upland	6.8	0.3
Tall Scrub			
Closed Tall Alder Scrub	Upland, Subalpine	1,214.7	46.8
Open Tall Alder Scrub	Upland, Subalpine	109.8	4.2
Low Scrub			
Closed Low Willow Scrub	Riverine, Upland, Subalpine	128.4	5.0
Open Low Willow Scrub	Riverine, Upland, Subalpine	33.0	1.3
Dwarf Shrub			
Mountain-heath Dwarf Shrub Tundra	Subalpine	7.7	0.3
Herbaceous			
Mixed Herbs	Subalpine	56.7	2.2
Subarctic Lowland Herb Bog Meadow	Upland	0.9	<0.1
Moist Graminoid, post burn or disturbance	Upland	2.3	0.1
Subarctic Lowland Grass Wet Meadow	Upland	0.8	<0.1
Subarctic Lowland Sedge-Moss Bog Meadow	Upland, Subalpine	11.6	0.5
Halophytic Sedge Marsh	Coastal	8.9	0.3
Other			
Barren (<5% vegetation cover)	Upland	60.9	2.4
Partially Vegetated (5–30% vegetation cover)	Riverine	36.3	1.4
Fresh Water	Lacustrine, Riverine, Subalpine	615.4	23.7
	Total	**2,595.4**	**100.0**

[1] Values rounded to one decimal place.

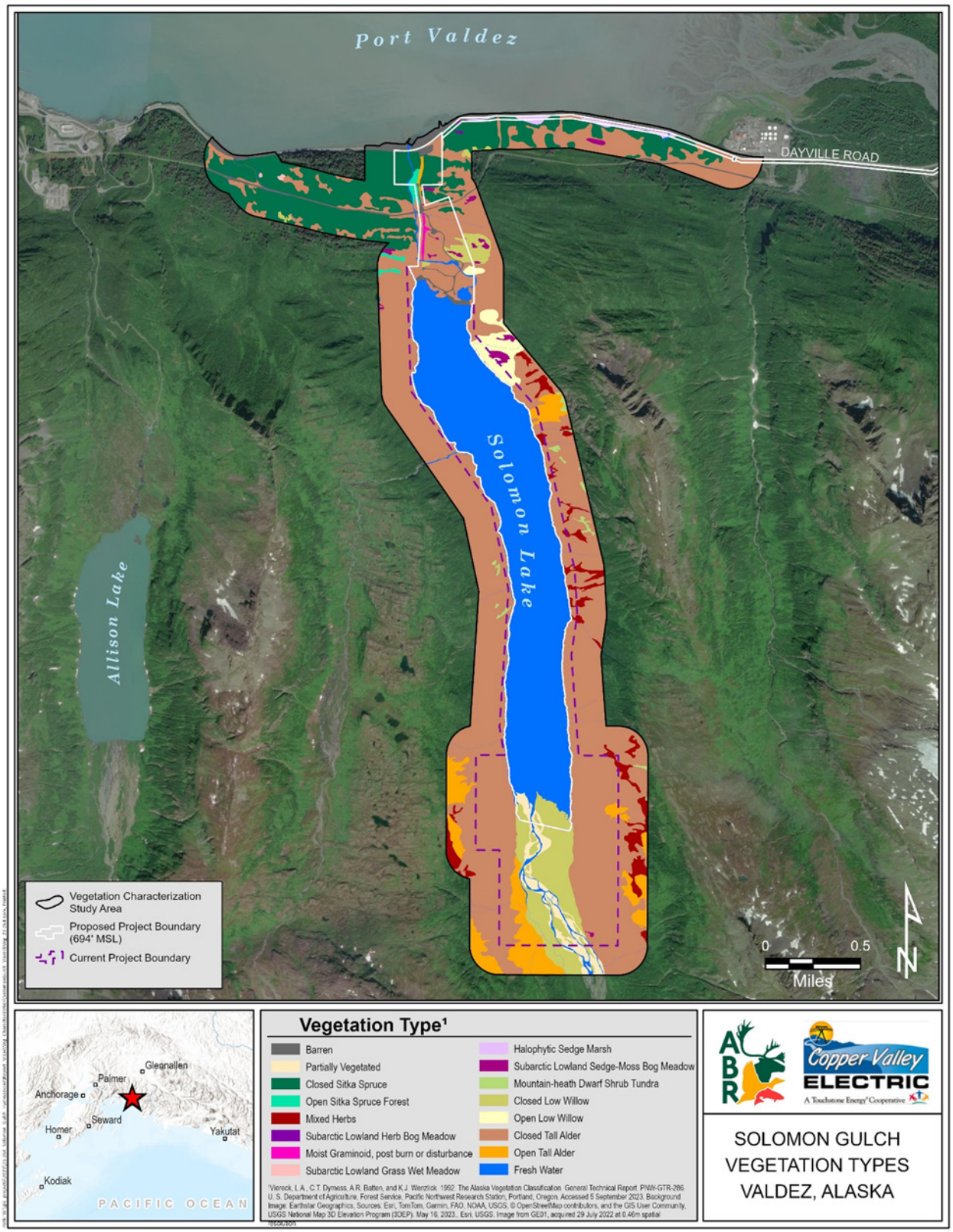

Figure 5-3 Vegetation mapped in the Vegetation Characterization Study Area

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 5-4, Figure 5-4).

Upland and Subalpine Tall Alder Scrub is the most extensive habitat covering nearly 50 percent of the study area (Table 5-4, Figure 5-4). Upland and Subalpine Tall Alder Scrub occurs on steep to moderately sloped hillsides above Solomon Lake (Figure 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* and *A. crispa,* with *Sambucus racemosa* (red eldberberry), *Rubus spectabilis* (salmonberry), and *Oplopanax horridus* (devil's club) typically present. Understory species commonly present include *Cornus suecica* (Lapland cornel), *Dryopteris dilatata* (spreading woodfern), and *Geum macrophyllum* (largeleaf avens).

The second most extensive habitat in the study area is Lakes, covering over 20 percent of the study area (Table 5-4). Solomon Lake, a deep reservoir lake in the valley bottom, is the only lake in the study area (Figure 5-4). Solomon Lake is over 20 acres in size, greater than 100 feet deep, and is comprised entirely of unvegetated fresh water.

Upland Sitka Spruce Forest is the next most abundant habitat, covering over 10 percent of the study area (Table 5-4). Located on the lower slopes above Valdez Bay in the northern portion of the study area (Figure 5-4), Upland Sitka Spruce Forest is dominated by *Picea sitchensis* (Sitka spruce) and *Tsuga heterophylla* (western hemlock) trees, with an understory that typically includes *O. horridus*, *R. arcticus* (arctic raspberry), and the ferns *Athyrium filix-femina* (common ladyfern) and *D. dilatata*.

All other habitats identified cover about five percent or less each of the study area (Table 5-4, Figure 5-4).

Table 5-4 Wildlife habitat types derived from vegetation, physiography, and surface form mapping in the Solomon Gulch Project Area.

Wildlife Habitat	Characteristics	Area Mapped (acres)[1]	Percent of Study Area[1]
Lakes	Deep reservoir lake in valley floor basin (>100 feet deep, >20 acres). Unvegetated with no floating or emergent vegetation borders. Solomon Lake is the only mapped lake in the Project area.	593.1	22.9
Ponds	Shallow unvegetated ponds (<10 feet) forming in shallow basins along stream courses. Unvegetated with no floating or emergent vegetation borders. Uncommon within impact assessment area.	2.7	0.1
Coastal Human-Modified Graminoid Meadow	Fill or recently modified surfaces near the coast that have been modified by human activity and are partially vegetated. Vegetation may include a mixture of indigenous and introduced plant species.	5.8	0.2
Rivers and Streams (High Gradient-High Flow)	Permanently flooded channels of freshwater where gradient and flow are relatively high. Sources of water are glacial meltwater, glacial lakes and surface water runoff. Water levels fluctuate rapidly but experience peak levels during spring melt and rainy periods.	5.8	0.2
Rivers and Streams (Low Gradient-High Flow)	Permanently flooded channels of freshwater where the gradient is relatively low, but flow remains high. Water sources are glacial meltwater, glacial lakes, and surface water runoff. Water levels fluctuate rapidly but experience peak levels during spring melt and rainy periods.	11.4	0.4
Rivers and Streams (Mixed Gradient-Low Flow)	Permanently flooded freshwater channels of any gradient where the flow is relatively low. Sources of water are glacial meltwater, glacial lakes, and surface water runoff.	2.3	0.1
Riverine Barrens (Outwash)	Flat gravel bars on active glacial outwash deposits with vegetation cover <30%. Substrates are extremely well drained composed of sands and gravels. Where present vegetation cover includes *Alnus tenuifolia*, *Salix sitchensis*, *Epilobium latifolium,* and *Arctagrostis latifolia*.	36.3	1.4

Wildlife Habitat	Characteristics	Area Mapped (acres)[1]	Percent of Study Area[1]
Riverine Low and Tall Willow	Flat areas on active glacial outwash deposits. Substrates are less well drained than Riverine Barrens. Vegetation includes the shrubs *Salix barclayi* and *S. arctica,* with an understory including *Calamagrostis canadensis*, *Epilobium latifolium,* and *Sanguisorba stipulata*.	109.7	4.2
Upland Wet Graminoid Moss Bog	Shallow basins along stream-courses within upland forested slopes with deep accumulation of organic material. Dominated by *Sphagnum* mosses with the sedges *Carex aquatilis*, *C. limosa*, and *Eriophorum gracile*, and the forbs *Lysichiton americanus* and *Sanguisorba stipulata*.	3.8	0.2
Upland Human-Modified Graminoid Meadow	Fill or recently modified surfaces along the pipeline corridor and in Solomon Gulch. Vegetation may include a mixture of indigenous and introduced plant species.	2.3	0.1
Upland and Subalpine Tall Willow Scrub	Drainage basins or drainageways in stream headwaters or along stream courses occupied primarily by willow species. Substrates are saturated and poorly drained. Common species include *Salix barclayi* and *S. sitchensis*.	35.5	1.4
Upland and Subalpine Tall Alder Scrub	Moderate to steep slopes throughout the upland and subalpine zones. Substrates are well drained and range from rocky with very little organic accumulation to deep organic deposits on more moderate slopes. Dominated by shrub species including *Alnus sinuata*, *A. crispa*, *Sambucus racemosa*, *Rubus spectabilis,* and *Oplopanax horridus*. Understory species include *Cornus suecica*, *Dryopteris dilatata*, and *Geum macrophyllum*.	1,280.4	49.3
Upland Sitka Spruce Forest	Steep forested lower slopes above Valdez Bay. Poorly developed, well drained soils with very little organic layer accumulation overlying rocky parent material. Species assemblages include *Picea sitchensis*, *Tsuga heterophylla*, *Oplopanax horridus*, *Rubus arcticus*, *Athyrium filix-femina,* and *Dryopteris dilatata*.	308.0	11.9

Wildlife Habitat	Characteristics	Area Mapped (acres)[1]	Percent of Study Area[1]
Subalpine Wet Graminoid Moss Bog	Basins along subalpine stream channels where water is perched. Soils are poorly drained, often inundated, and have very little organic accumulation. Species include the graminoids *Carex machrochaeta*, *C. rotundata*, *C. aquatilis*, and *Calamagrostis canadensis,* and the forb *Rubus arcticus*.	9.3	0.4
Subalpine and Alpine Herb Meadow	Steep slopes of unconsolidated colluvium at higher elevations. Substrates are well drained with very little soil development over unweathered parent material. Plant communities are a mixture of herbs and graminoids including *Epilobium angustifolium*, *Heracleum lanatum*, *Sanguisorba stipulata*, *Valeriana sitchensis*, *Arctagrostis latifolia*, and *Vahlodea atropurpurea*.	117.3	4.5
Subalpine and Alpine Dwarf Ericaceous Scrub	Undulating terrain surrounding Solomon Lake and at higher elevations above the lake. Very thick organic layers over well drained silt loam soils. Plant communities are dominated by dwarf shrubs including *Cassiope stelleriana*, *Phyllodoce aleutica*, *Luetkea pectinata,* and *Empetrum nigrum*. *Vahlodea atropurpurea* is a commonly occurring graminoid.	7.7	0.3
Artificial Fill	Filled or recently human-modified barren surfaces. Areas within the Project boundaries include gravel access roads and laydown pads.	64.0	2.5
	Total	**2,595.4**	**100.0**

[1] Values rounded to one decimal place.

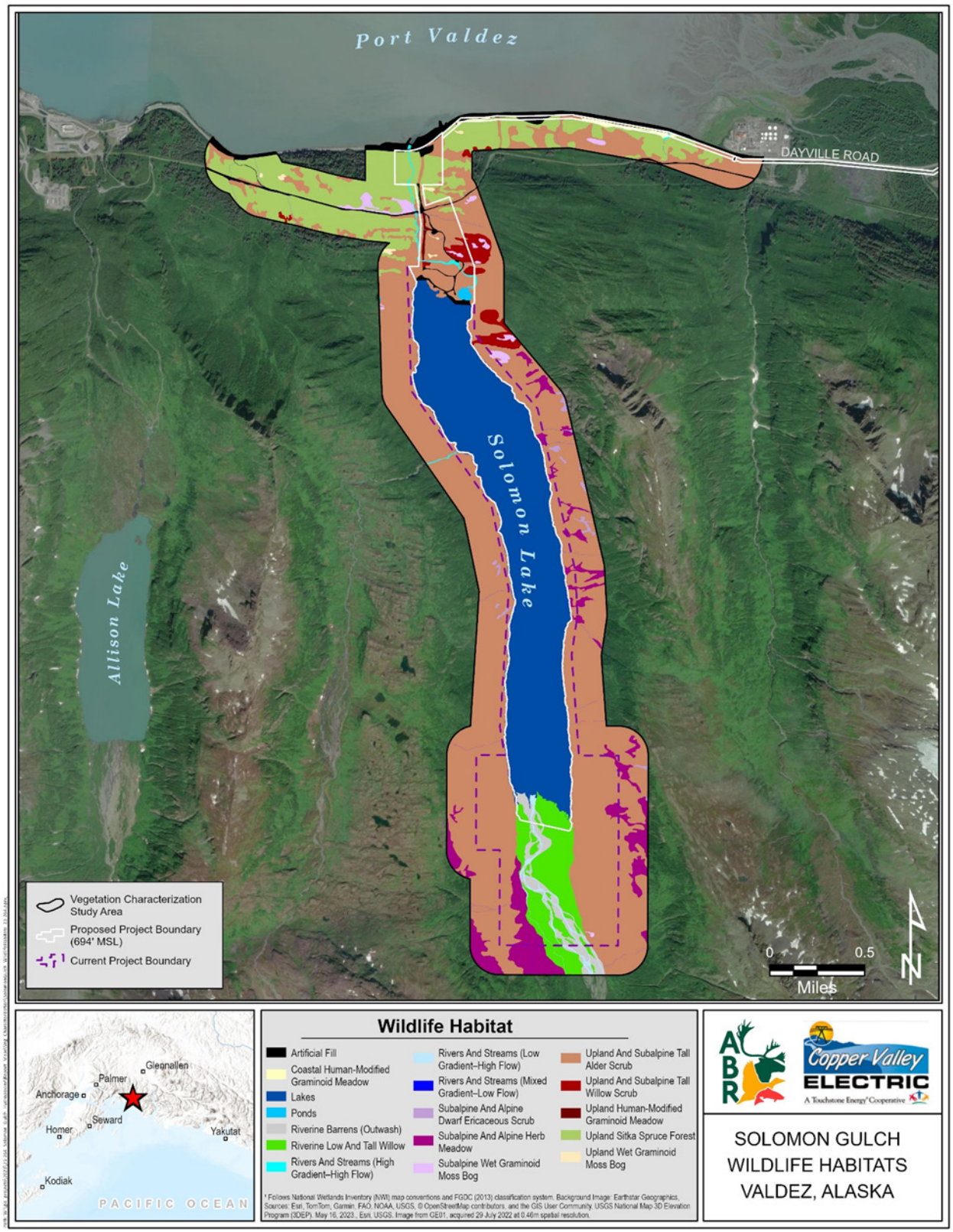

Figure 5-4 Wildlife Habitats in the Vegetation Characterization Study Area

5.5 Wetland Types

The broad-scale wetlands and waters mapping conducted within the study area is appropriate for use in the FERC relicensing process, and because no new infrastructure is being proposed for the Project, the mapping is not intended to support a wetland permit application under the Section 404 of the Clean Water Act. For these reasons, detailed wetland determination plots following the USACE 3-parameter approach for defining wetlands (Environmental Laboratory 1987) and the methodology described in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (USACE 2007) were not sampled in the field. Because of the lack of wetland-specific field data supporting the NWI determinations, and the broad-scale at which wetlands were mapped, these data are not intended for use in wetland permitting.

Within the study area, a total of 13 NWI types were observed, 5 of which were waters, 6 were wetlands, and 2 were upland types (Table 5-5, Figure 5-5). Uplands (U) were the most common NWI code, covering over 65 percent of the study area. Lacustrine Limnetic Permanently Flooded Unconsolidated Bottom (L1UBH) was the next most common NWI type, comprising Solomon Lake (Figure 5-5) and encompassing nearly 23 percent of the study area. All other NWI types covered less than 5 percent of the study area each (Table 5-5). Palustrine Seasonally Flooded Broad-leaved Deciduous Scrub-Shrub (PSS1C) wetlands are limited to the active floodplain of rivers and streams, and all other wetland types are in relatively small forest openings or occur in toeslope landscape positions.

Table 5-5 Wetland types based on photointerpretation and limited verification field data for the Solomon Gulch Project.

NWI Code	NWI Description	Area Mapped (acres)[1]	Percent of Study Area[1]
Waters			
R3UBH	Riverine Upper Perennial Permanently Flooded Unconsolidated Bottom	19.6	0.8
R3USC	Riverine Upper Perennial Seasonally Flooded Unconsolidated Shore	19.2	0.7
R3UBH/USC	Riverine Upper Perennial Waters and Shores	17.1	0.7
L1UBH	Lacustrine Limnetic Permanently Flooded Unconsolidated Bottom	593.1	22.9
PUBH	Palustrine Permanently Flooded Unconsolidated Bottom	2.7	0.1
	Waters Total	**651.7**	**25.1**
Wetlands			
E2EM1N	Estuarine Intertidal Regularly Flooded Persistent Emergent	8.9	0.3
PEM2H	Palustrine Permanently Flooded Nonpersistent Emergent	0.9	<0.1
PEM1E	Palustrine Seasonally Flooded-Saturated Persistent Emergent	3.3	0.1
PEM1D	Palustrine Continuously Saturated Persistent Emergent	9.0	0.4
PSS1C	Palustrine Seasonally Flooded Broad-leaved Deciduous Scrub-Shrub	109.7	4.2
PSS1B	Palustrine Seasonally Saturated Broad-leaved Deciduous Scrub-Shrub	53.8	2.1
	Wetlands Total	**185.5**	**7.1**
Uplands			
U	Upland	1,697.2	65.4
Us	Upland (fill)	60.9	2.4
	Uplands Total	**1,758.1**	**67.7**
	Grand Total	**2,595.4**	**100.0**

[1] Values rounded to one decimal place.

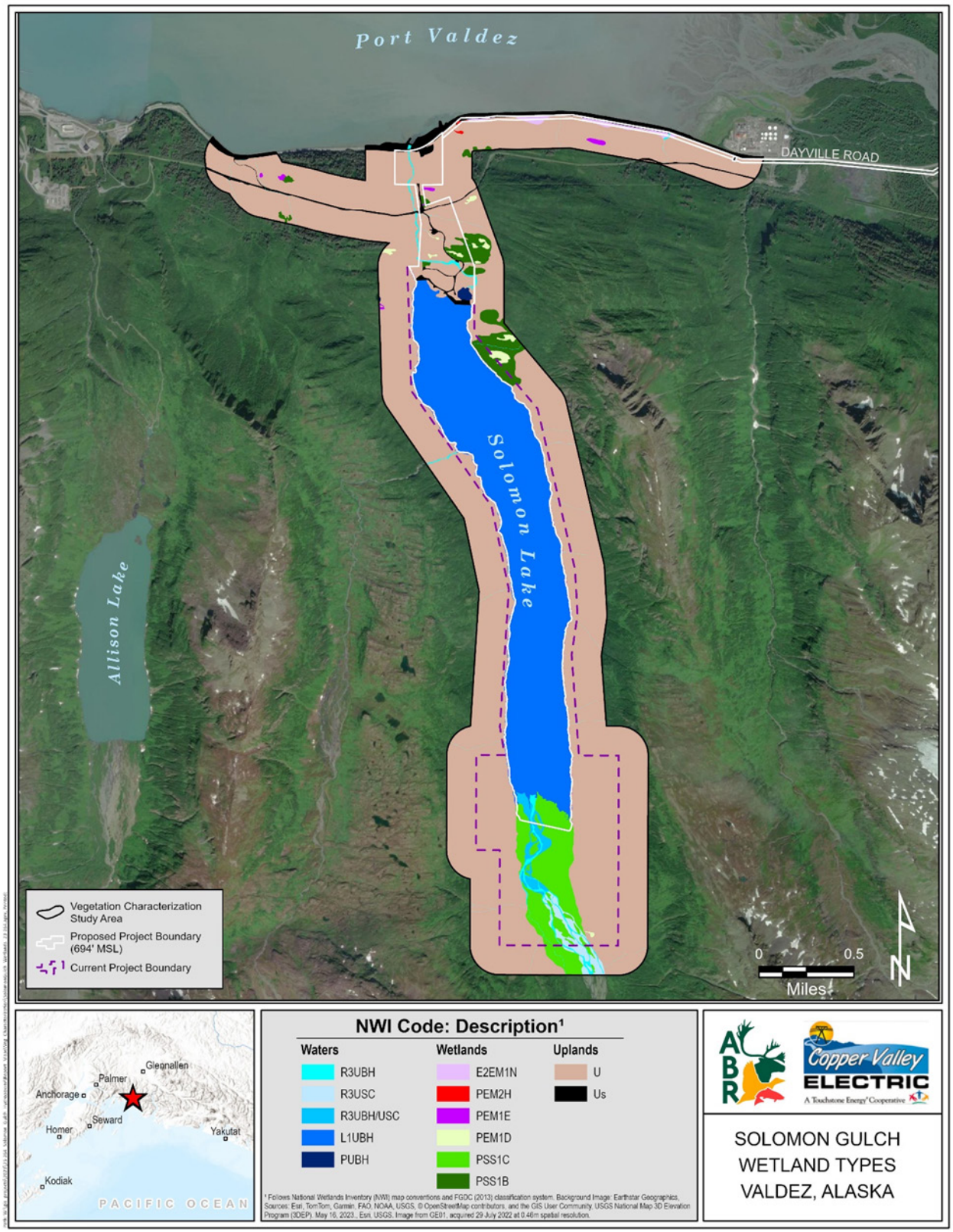

Figure 5-5 Wetlands in the Vegetation Characterization Study Area

6.0 STUDY VARIANCES

Variances to the FSP are summarized below.

- Field methods, soil pits—Soil pits were not always excavated to the full 20-inch depth described in the FSP due to field conditions (e.g., gravel, cobbles, high-water table). Soils characteristics that can influence wildlife habitat development, such as the depth of surface organic horizons and the dominant mineral soil texture, were recorded in lieu of complete soil pedon descriptions.
- Classification and mapping—The FSP indicated that map polygons for landscape features would be digitized at a scale of 1:2,000, but map polygons were digitized at a broader 1:5,000 scale, which was determined to be sufficient to identify and delineate the wetland and wildlife habitat types in the Project area.
- Analysis and reporting—The FSP indicates that separate maps for rare and sensitive plants and invasive plants would be developed prior to the field survey to help streamline the surveys for those plant taxa. The wildlife habitat classification and mapping adequately capture the vegetation and landform diversity that would affect rare plant distribution across the Project area. Similarly, the wildlife habitat classification includes the mapping of disturbed and gravel-filled habitats where invasive plants have colonized and spread in the Project area.

7.0 STUDY SPECIFIC CONSULTATION

On November 20, 2023, CVEA filed its DSP developed for the relicensing of the Project. Stakeholders were provided 45 days to comment on the DSP. After review of the DSP by the agencies, the only comment related to the Vegetation Characterization Study was made by the USFWS. The USFWS requested copies of the Project field data and wetland mapping to help inform updates to the NWI mapping in the Valdez region. CVEA agreed to share the Project data with USFWS. Following the comment period, CVEA filed the FSP with FERC on April 10, 2024. No comments were provided for this Vegetation Characterization Study.

This Vegetation Characterization Draft Study Report is being distributed to relicensing participants for a 60-day review period. After the review period, CVEA will update the report based on comments received, and file the final report with FERC.

8.0 SUMMARY

This was a single-year study; the study has met all objectives outlined in the FSP and is complete. No additional or future vegetation characterization studies are proposed.

9.0 REFERENCES

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ATTACHMENT A

FULL GROUND REFERENCE PLOTS

Sampling Point: sg_01
Date: 2024-07-15
Wildlife Habitat: Riverine Barrens
Physiography: Riverine
Macrotopography: Bar
Viereck code: Partially Vegetated
Dominant Mineral: Gravelly

Notes: Large cobbles and coarse sandy substrate. Rafted debris still live in some cases. Main channel has moved from what is shown in photography. No invasive or rare plants observed.

Sampling Point: sg_03
Date: 2024-07-15
Wildlife Habitat: Riverine Low and Tall Willow
Physiography: Riverine
Macrotopography: Riverbanks
Viereck code: Closed Tall Alder-Willow
Dominant Mineral: Sandy

Notes: No near surface water table, thick layer of leaf litter, soil pedon layered coarse and fine mineral soil, live roots but no thick organic layers. Phenology very early, leaves on willows just emerging and forb layer limited to early grasses and evergreens.

Sampling Point: sg_04
Date: 2024-07-15
Wildlife Habitat: Riverine Low and Tall Willow
Physiography: Riverine
Macrotopography: Riverbanks
Viereck code: Open Tall Alder-Willow
Dominant Mineral: Sandy

Notes: Raised bank next to a secondary channel, soil with embedded layers of fines and coarse material. Very early phenology on the willows and forbs, ferns just emerging, Calamagrostis canadensis mostly dead and may be rafted material.

Sampling Point: sg_05
Date: 2024-07-15
Wildlife Habitat: Riverine Low and Tall Willow
Physiography: Human-altered
Macrotopography: Riverbanks
Viereck code: Open Tall Alder-Willow
Dominant Mineral: Sandy

Notes: Plot at the edge of a river blowout, running water across the forest floor next to the plot. Veg still early phenology

Sampling Point: sg_07
Date: 2024-07-15
Wildlife Habitat: Riverine Low and Tall Willow
Physiography: Riverine
Macrotopography: Cliff (Rocky)
Viereck code: Open Tall Alder-Willow
Dominant Mineral: Gravelly

Notes: Vegetated riverbar, aquatic mosses colonizing surfaces, high water table. Very diverse willow community, two sedges in early phenology, Salix hookeriana does not appear to be present.

Sampling Point: sg_09
Date: 2024-07-15
Wildlife Habitat: Riverine Low and Tall Willow
Physiography: Riverine
Macrotopography: Riverbanks
Viereck code: Open Low Alder-Willow
Dominant Mineral: Gravelly

Notes: Slightly raised vegetated bar, water table not near surface, fine deposits colonized by moss.

Sampling Point: sg_10
Date: 2024-07-15
Wildlife Habitat: Riverine Low and Tall Willow
Physiography: Riverine
Macrotopography: Riverbanks
Viereck code: Closed Tall Alder-Willow
Dominant Mineral: Gravelly

Notes: Off channel vegetated bar with Populus trichocarpa (cottonwood) trees. Evidence of sediment transport and sheet flow suggests area floods regularly.

Sampling Point: sg_13
Date: 2024-07-16
Wildlife Habitat: Artificial Fill
Physiography: Human-altered
Macrotopography: Human Modified
Viereck code: Alpine Herbs
Dominant Mineral: Rubbly

Notes: Solomon gulch dam, just the thinnest of moss layers developing over cobble dam material, vegetation encroaching from forest.

Sampling Point: sg_14
Date: 2024-07-16
Wildlife Habitat: Artificial Fill
Physiography: Human-altered
Macrotopography: Human Modified
Viereck code: Partially Vegetated
Dominant Mineral: Gravelly

Notes: Small patch of trifolium in the middle of a gravel turnaround.

Sampling Point: sg_15
Date: 2024-07-16
Wildlife Habitat: Upland Wet Graminoid Moss Bog
Physiography: Upland
Macrotopography: Nonpatterned
Viereck code: Subarctic Lowland Sedge Bog Meadow
Dominant Mineral: Peat

Notes: Blanket bog, Eleocharis and high cover of Sphagnum mosses. Surface water in patches with distinct inlet and outlet.

Sampling Point: sg_16
Date: 2024-07-16
Wildlife Habitat: Upland Human Modified Graminoid Meadow
Physiography: Human-altered
Macrotopography: Human Modified
Viereck code: Subarctic Lowland Sedge Wet Meadow
Dominant Mineral: Gravelly

Notes: Low spot in access road with ponded surface water and wetland sedges.

Sampling Point: sg_17
Date: 2024-07-16
Wildlife Habitat: Upland and Subalpine Tall Alder Scrub
Physiography: Upland
Macrotopography: Undifferentiated Slope
Viereck code: Open Tall Alder
Dominant Mineral: Peat

Notes: Open alder stand with a mix of shrubs, forbs, and graminoids at the edge of a series of blanket bogs. Ecotone between blanket bog and closed tall alder. Hummocks up to 18 inches high.

Sampling Point: sg_18
Date: 2024-07-16
Wildlife Habitat: Upland Wet Graminoid Moss Bog
Physiography: Upland
Macrotopography: Undifferentiated Slope
Viereck code: Subarctic Lowland Sedge Bog Meadow
Dominant Mineral: Peat

Notes: Blanket bog forming at a slope break above the road embankment. Surface water in a small beaded stream, high cover of Sphagnum mosses.

Sampling Point: sg_19
Date: 2024-07-16
Wildlife Habitat: Upland Human Modified Graminoid Meadow
Physiography: Human-altered
Macrotopography: Human Modified
Viereck code: Mixed Herbs
Dominant Mineral: Gravelly

Notes: Transmission line access road next to pipeline. Revegetated lay down area.

Sampling Point: sg_21
Date: 2024-07-16
Wildlife Habitat: Upland Sitka Spruce Forest
Physiography: Upland
Macrotopography: Undifferentiated Slope
Viereck code: Closed Sitka Spruce-Western Hemlock Forest
Dominant Mineral: Gravelly

Notes: Western hemlock forest with sparse Sitka spruce, on a rocky knoll surrounded by tall alder. Very few standing dead hemlocks, all Sitka spruce alive. Insect infestation on Vaccinium ovalifolium and Rubus pedatus.

Sampling Point: sg_24
Date: 2024-07-17
Wildlife Habitat: Upland and Subalpine Tall Alder Scrub
Physiography: Upland
Macrotopography: Human Modified
Viereck code: Closed Tall Alder
Dominant Mineral: Gravelly

Notes: Steep side slope of the access road, possibly previously cleared and recolonized with alder. Rubus spectabilis significantly defoliated by insects.

Sampling Point: sg_25
Date: 2024-07-17
Wildlife Habitat: Upland Human Modified Graminoid Meadow
Physiography: Human-altered
Macrotopography: Human Modified
Viereck code: Mixed Herbs
Dominant Mineral: Gravelly

Notes: Vegetated margin of access road. Rhinanthus minor infestation, Taraxacum officinale throughout the plot.

Sampling Point: sg_26
Date: 2024-07-17
Wildlife Habitat: Upland Sitka Spruce Forest
Physiography: Upland
Macrotopography: Undifferentiated Slope
Viereck code: Closed Sitka Spruce
Dominant Mineral: Gravelly

Notes: Sitka spruce uplands, soils are 5 inches of organics over weathered bedrock.

Sampling Point: sg_27
Date: 2024-07-17
Wildlife Habitat: Upland Human Modified Graminoid Meadow
Physiography: Human-altered
Macrotopography: Human Modified
Viereck code: Mixed Herbs
Dominant Mineral: Gravelly

Notes: Vegetated roadside.

Sampling Point: sg_30
Date: 2024-07-17
Wildlife Habitat: Upland Wet Graminoid Moss Bog
Physiography: Upland
Macrotopography: Nonpatterned
Viereck code: Subarctic Lowland Grass Wet Meadow
Dominant Mineral: Peat

Notes: Wet meadow dominated by Calamagrostis canadensis with Carex microchaeta and Lysichiton americanus.

Sampling Point: sg_36
Date: 2024-07-17
Wildlife Habitat:
Physiography: Coastal
Macrotopography: Basins Or Depressions
Viereck code: Halophytic Sedge Wet Meadow
Dominant Mineral: Clayey

Notes: Salt marsh in an intertidal estuarine pond. Coastal sedge meadow with Carex lyngbyei, Scirpus, and an aquatic marine grass (Zostera?). Searched for coastal rare plant list but did not find any target species.

ATTACHMENT B

MAP VERIFICATION PLOTS

Sampling Point: sg_02
Date: 2024-07-15
Wildlife Habitat: Rivers and Streams (High gradient-high flow)
Physiography: Riverine
Macrotopography: River or Stream
Viereck code: Fresh Water

Notes: High velocity upper perennial stream, water appears to be high and nearly at bankfull.

Sampling Point: sg_06
Date: 2024-07-15
Wildlife Habitat: Lakes
Physiography: Lacustrine
Macrotopography: Basins Or Depressions
Viereck code: Fresh Water

Notes: Southern end of Solomon gulch reservoir, near Solomon Creek inlet. No littoral zone. Water levels very high at the time of the survey, accumulated debris at the edge of the lake.

Sampling Point: sg_08
Date: 2024-07-15
Wildlife Habitat: Rivers and Streams (Low gradient-high flow)
Physiography: Riverine
Macrotopography: River or Stream
Viereck code: Fresh Water

Notes: Solomon Creek south of the reservoir. Water level high at the time of the survey. High velocity water, riffles, in-stream rafted debris.

Sampling Point: sg_20
Date: 2024-07-16
Wildlife Habitat: Rivers and Streams (Mixed gradient-low flow)
Physiography: Riverine
Macrotopography: Channel
Viereck code: Fresh Water

Notes: Small upper perennial stream. Stream is 3ft wide, rocky bottom with riffles and pools. Overhanging vegetation obscures this small channel in imagery.

Sampling Point: sg_22
Date: 2024-07-16
Wildlife Habitat: Upland and Subalpine Tall Alder Scrub
Physiography: Upland
Macrotopography: Human Modified
Viereck code: Open Tall Alder-Willow

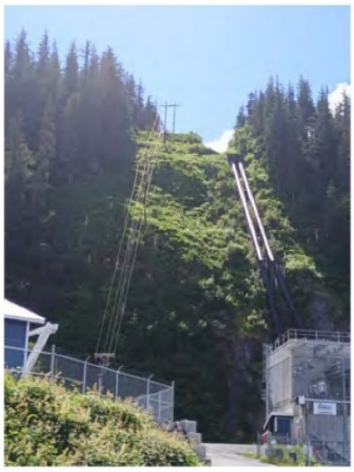
Notes: Mix of open low to tall shrub and wet meadow in a drainage with a small R3UBH stream.

Sampling Point: sg_23
Date: 2024-07-17
Wildlife Habitat: Rivers and Streams (High gradient-high flow)
Physiography: Riverine
Macrotopography:
Viereck code: Fresh Water

Notes: Solomon Creek. High water during field survey, creek almost at bankfull. High gradient, high velocity upper perennial stream with a step pool sequence. Boulder substrate, cliff walls for banks, no riparian area to speak of.

Sampling Point: sg_32
Date: 2024-07-17
Wildlife Habitat: Upland and Subalpine Tall Alder Scrub
Physiography: Upland
Macrotopography: Undifferentiated Slope
Viereck code: Open Tall Alder

Notes: Photo of inaccessible portions of the transmission line. Steep rocky cliff vegetated with low to tall shrubs, fern, devils club and sapling needle leaf trees.



Sampling Point: sg_33
Date: 2024-07-17
Wildlife Habitat: Upland Herb Meadow
Physiography: Upland
Macrotopography:
Viereck code: Subarctic Lowland Herb Bog Meadow

Notes: Toe of road embankment under the power lines. Skunk cabbage meadow with permant standing water in depressions.

Sampling Point: sg_34
Date: 2024-07-23
Wildlife Habitat: Coastal Human Modified Graminoid Meadow
Physiography: Coastal
Macrotopography: Drainage
Viereck code: Halophytic Herb Wet Meadow

Notes: Intertidal salt marsh and tidal gut next to Dayville Road. Salt marsh

Sampling Point: sg_35
Date: 2024-07-17
Wildlife Habitat: Coastal Human Modified Graminoid Meadow
Physiography: Coastal
Macrotopography: Basins Or Depressions
Viereck code: Marine Water

Notes: Intertidal pond, depth variable due to daily tidal fluctuations. Aquatic veg appears to be limited to various algae. Water relatively silty.

APPENDIX C

RARE AND SENSITIVE PLANT DRAFT STUDY REPORT

RARE AND SENSITIVE PLANT DRAFT STUDY REPORT

SOLOMON GULCH HYDROELECTRIC PROJECT
FERC NO. 2742

Submitted by:

Copper Valley Electric Association
Valdez, Alaska

Prepared by:

ABR, Inc—Environmental Research & Services

January 2025

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DEFINITIONS OF TERMS, ACRONYMS, AND ABBREVIATIONS

A	
ABR	ABR, Inc.—Environmental Research & Services
ACCS	Alaska Center for Conservation Science
B	
BLM	Bureau of Land Management
C	
CVEA	Copper Valley Electric Association, Inc.
D	
DSP	Draft Study Plan
F	
FERC	Federal Energy Regulatory Commission
FSP	Final Study Plan
P	
PAD	Preliminary Application Document
Project	Solomon Gulch Hydroelectric Project
U	
USFS	U.S. Forest Service

1.0 INTRODUCTION

Copper Valley Electric Association, Inc. (CVEA or Licensee) is the Licensee, owner, and operator of the existing 12-megawatt Solomon Gulch Hydroelectric Project, Federal Energy Regulatory Commission (FERC) Project No. 2742 (Project). The Solomon Gulch Project is a major project located on Solomon Lake near Valdez, Alaska. The original license was issued on June 21, 1978, for a term of 50 years, and expires on May 31, 2028. CVEA is pursuing a new license for the Project using the FERC Traditional Licensing Process. CVEA submitted a Pre-Application Document (PAD) and Notice of Intent on April 28, 2023.[1] A detailed description of the Solomon Gulch Project is provided in the PAD.

On November 20, 2023, CVEA filed a Draft Study Plan (DSP) with FERC[2] and distributed it to stakeholders. The DSP outlined seven studies proposed to take place in summer 2024 as part of the relicensing process. CVEA filed the Final Study Plan (FSP) with FERC on April 10, 2024 (CVEA 2024).[3]

This report describes the results of the Rare and Sensitive Plant Study, which was conducted following methods described in the FSP.

To date, no comprehensive review of plant collection data, habitat-based mapping, or ground surveys for rare and sensitive plants have been completed for the Project area. To address the lack of existing data, the Rare and Sensitive Plant Study provides a current list of the rare and sensitive plant taxa that could occur in the Project area based on the habitats available, and with a field survey documents the locations and sizes of any populations of rare and sensitive taxa found. These data will be used to assess how Project operations could affect rare and sensitive plant populations on site and can also be used in future monitoring of the status of any rare and sensitive plant populations found in the Project area.

[1] FERC Accession Number 20230428-5508.
[2] FERC Accession Number 20231120-5091.
[3] FERC Accession Number 20240410-5151.

2.0 STUDY AREA

The study area for the Rare and Sensitive Plant Study encompasses the Project Boundary for the Solomon Gulch Hydroelectric Project, including a 50-foot (15.2-meter) buffer surrounding the John Hunter Memorial Trail and the portion of the transmission line running from the powerhouse to the Petro Star facility on Dayville Road (Figure 2-1). The study area is mountainous, dominated by tall alder scrub and Sitka spruce rainforest plant communities with small patches of peatland developing in basins, depressions, and slope breaks. No rare habitats known to support rare plant species in southcentral Alaska, such as calcareous fens, have been documented in the area and are not likely to occur within the Solomon Gulch Project Boundary (McClellan et al. 2003).

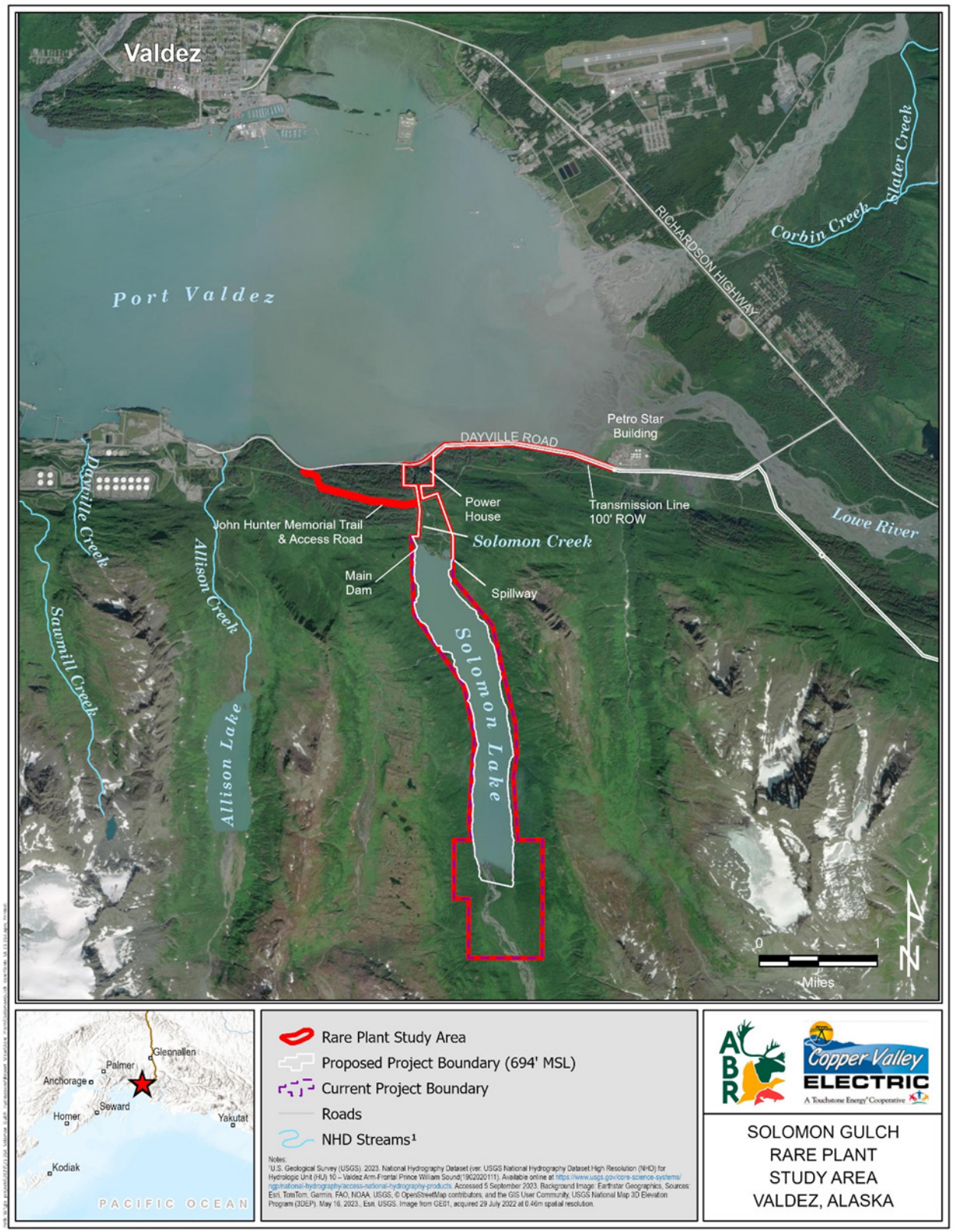

Figure 2-1 Rare and Sensitive Plant Study Area

3.0 GOALS AND OBJECTIVES

The goal of the Rare and Sensitive Plant Study is to develop current data on the occurrence and size of rare and sensitive plant populations in the Project area, which will be used in the license application to assess possible impacts of Project operations on those plant taxa.

The specific objectives of the Rare and Sensitive Plant Study are to:

- Establish a list of possible rare and sensitive plant taxa that could occur in the Project area based on the habitats available and existing plant collection data for the Prince William Sound area. This will be referred to as the focal rare and sensitive plant list.
- Conduct a search for rare and sensitive plant taxa in the Project area following a random meander sampling method (U.S. Forest Service [USFS] 2015).
- Document the locations of any rare and sensitive plant taxa populations in the Project area and estimate population sizes.

4.0 STUDY SCOPE AND METHODOLOGY

4.1 Focal List Development

Rare vascular plant collection locations within the Project Boundary and a 43-mile (70-kilometer) buffer zone surrounding it were requested from the Alaska Rare Vascular Plant Database maintained by the Alaska Center for Conservation Science (ACCS 2024). In this case, a large buffer area is required to capture collection locations of rare and sensitive plant taxa, which are typically widely dispersed on the landscape. In this Rare and Sensitive Plant Study, the focal rare plant list was developed in consultation with ACCS lead botanist Justin Fulkerson, who provided a list of any rare vascular plant documented within 43-miles (70-kilometers) of the study area, and potentially within a habitat in the study area. Habitats of plant taxa on the focal list were assessed from information in the Flora of Alaska (Hultén 1968) and the Flora of North America (FNA 2024).

ACCS assigns state conservation ranks to Alaska species using NatureServe's conservation ranking protocol (NatureServe 2024), which incorporates distribution, abundance, condition, threats, and trend data. Species are ranked from 1 to 5, with lower ranks indicating a higher degree of imperilment. Taxa with very few occurrences in the state and which have a very high risk of extirpation from the state are given an S1 ranking (critically imperiled), whereas species with few occurrences in the state and a high risk of extirpation are given an S2 ranking (imperiled). Taxa listed as S3 (vulnerable) have a moderate risk of extirpation, and S4 (apparently secure) are at low risk of extirpation. All species meeting the occurrence and habitat preference criteria with rankings from S1 to S3S4 were included on the focal species list.

The land within the Project Boundary is primarily state land with a small area of Bureau of Land Management (BLM) land at the head of Solomon Lake. The BLM Special Status Species List tracks a list of Sensitive plants that have official status under the BLM 6840 policy and a list of Watch plants that do not have special status but warrant tracking. Candidates for the Sensitive and Watch Lists are based on both the state ranks and NatureServe ranks as described above. All species meeting the occurrence and habitat preference criteria for either the Sensitive or Watch plant lists (BLM 2019) were included on the focal species list.

The PAD for the Solomon Gulch Project (CVEA 2023) identifies two rare plant taxa monitored by ACCS that may occur within the Project area: Hulten alkaligrass (*Puccinellia hultenii*) and Alaskan pretty shooting star (*Dodecatheon pulchellum* ssp. *Alaskanum*). These two previously identified potential species did not meet the criteria established for defining a focal list, and thus are not included. In addition, no rare or sensitive plant species were identified during the field studies associated with the Allison Lake wildlife habitat studies conducted in the neighboring valley (ABR, Inc.—Environmental Research & Services [ABR] 2011a, 2011b).

4.2 Field Sampling

The field survey was conducted in conjunction with the field work for the Vegetation Characterization Study (Draft Study Report, Appendix B) and Invasive Plants Study (Draft Study Report, Appendix D). At each full ground reference plot, the vegetation composition and structure were documented and rare plants on the focal list were searched for according to the assigned general habitat preferences. Rare plant searches were also conducted at map verification plots as habitats dictate. A limited set of data including site photos and dominant plants were recorded at verification plots to provide additional map reference points.

The rare and sensitive plant field survey was conducted using a random meander sampling methodology developed by the USFS for rare plant surveys in the Tongass National Forest in southeast Alaska (USFS 2015). The method involves thorough searches of the likely habitats for plant taxa on the focal list. Field plots for the Vegetation Characterization Study had a 32.8-foot (10-meter) radius. At each Vegetation Characterization Study plot, if a general habitat associated with a rare plant was present the habitat within the plot was searched using the random meander sampling method. For example, if a lake or pond was present within the 32.8-foot (10-meter) radius plot, the waters and their shores were searched for the focal species likely to occur in freshwater environments: *Isoetes occidentalis*, *Limosella aquatica*, and *Zannichellia palsutris* ssp. *palustris*.

The search paths were recorded as GPS tracks using the streaming function on a recreational-grade GPS receiver. Each occurrence of a plant(s) on the focal list was documented with location coordinates, estimated population size, associated vascular and non-vascular plants, and site photographs. When possible (without risking

detrimental population-level impacts), voucher specimens were collected and confirmed by ACCS or University of Alaska Museum of the North botanical staff.

5.0 STUDY RESULTS AND DISCUSSION

5.1 Focal List

A total of 21 rare taxa were identified under the criteria described above (Table 5-1). ACCS has assigned state conservation ranks to these 21 rare taxa that range from S1 to S3S4. Of these 21 rare taxa, three are on the BLM Sensitive species list, and one is on the BLM Watch list. Preferred habitat characteristics corresponded to 11 of the 17 Wildlife Habitats classified in the Vegetation Characterization Study.

5.2 Field Survey

The Rare and Sensitive Plant Study field survey was conducted July 15–17, 2024. Nineteen full ground reference plots and nine map verification plots were sampled within the study area (Figure 5-1). The random meander sampling method was used in all the general habitats with the potential to support a rare plant. This includes vegetation types that were sampled in the field but 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. No rare plants on the Rare and Sensitive Plant Study focal list were observed during the field study.

Table 5-1 Rare and Sensitive Plant Focal List

Species	NatureServe Rank (BLM Listing)	General Species Habitat	Project Habitat Search Areas[4]
Arnica ovata	S3S4	Montane to subalpine moist meadows and conifer forests, stream banks, late snow-melt areas.	Upland Sitka Spruce Forest, Subalpine and Alpine Herb Meadow
Cardamine pensylvanica	S1	Moist to wet habitats, including marshes, swamps, seeps lake margins, and forests.	Upland Wet Graminoid Moss Bog, Subalpine Wet Graminoid Moss Bog, Upland Sitka Spruce Forest
Cochlearia sessilifolia	S2 (Sensitive)	Gravel bars, gravel spits in lagoon outlets submerged at high tide, seashores.	Coastal Human Modified Graminoid Meadow
Eleocharis quinqueflora	S2	Fens, wet meadows, seeps, and springs.	Upland Wet Graminoid Moss Bog, Subalpine Wet Graminoid Moss Bog
Glehnia littoralis ssp. *leiocarpa*	S3	Sandy beaches.	Coastal Human Modified Graminoid Meadow
Isoetes occidentalis	S3S4	Lake margins.	Lakes and Ponds
Limosella aquatica	S3	Wet mud, periodically flooded mud of streams and ponds.	Lakes and Ponds
Monotropa uniflora	S1	Moist to dry coniferous and mixed coniferous-deciduous forests.	Upland Sitka Spruce Forest
Phyllospadix serrulatus	S3 (Watch)	Upper tidal to subtidal zones with rocky substrates.	Coastal Human Modified Graminoid Meadow
Podagrostis humilis	SNR	Undisturbed alpine and subalpine meadows and scree fields. Low elevation meadows, fens, and open woodlands.	Upland Sitka Spruce Forest, Subalpine and Alpine Herb Meadow

[4] Wildlife habitats, as mapped in the Solomon Gulch Vegetation Characterization Study.

Species	NatureServe Rank (BLM Listing)	General Species Habitat	Project Habitat Search Areas[4]
Podagrostis thurberiana	S3	Undisturbed alpine and subalpine meadows and scree fields. Low elevation meadows, fens, and open woodlands.	Upland Sitka Spruce Forest, Subalpine and Alpine Herb Meadow
Polygonum fowleri ssp. *fowleri*	S3S4	Sandy or gravelly seashores.	Coastal Human Modified Graminoid Meadow
Polystichum setigerum	S3	Lowland coastal forest floors.	Upland Sitka Spruce Forest
Ranunculus orthorhynchus var. *orthorhynchus*	S3	Meadows and marshy areas.	Upland Wet Graminoid Moss Bog, Subalpine Wet Graminoid Moss Bog
Ranunculus pacificus	S3S4 (Sensitive)	Along streams and in meadows.	Upland Wet Graminoid Moss Bog, Subalpine Wet Graminoid Moss Bog, Rivers and Streams
Romanzoffia unalaschcensis	S3S4 (Sensitive)	Moist to wet river and stream banks, beach terraces, rock crevices and faces, and at forest edges.	Upland Sitka Spruce Forest, Rivers and Streams
Salix hookeriana	S2S3	Beach ridges, stabilized sand dunes, coastal meadows.	Coastal Human Modified Graminoid Meadow, Upland and Subalpine Tall Willow Scrub, Riverine Low and Tall Willow
Stellaria umbellata	S3S4	Moist meadows, rocky summits, gravelly stream- and roadsides.	Coastal Human Modified Graminoid Meadow, Artificial Fill
Viola selkirkii	S3S4	Wet to moist thickets, mixed or coniferous woods.	Upland Sitka Spruce Forest
Viola sempervirens	S1	Coastal forests.	Upland Sitka Spruce Forest
Zannichellia palustris ssp. *palustris*	S3S4	Brackish or freshwater streams, lakes, and estuaries.	Lakes and Ponds, Rivers and Streams

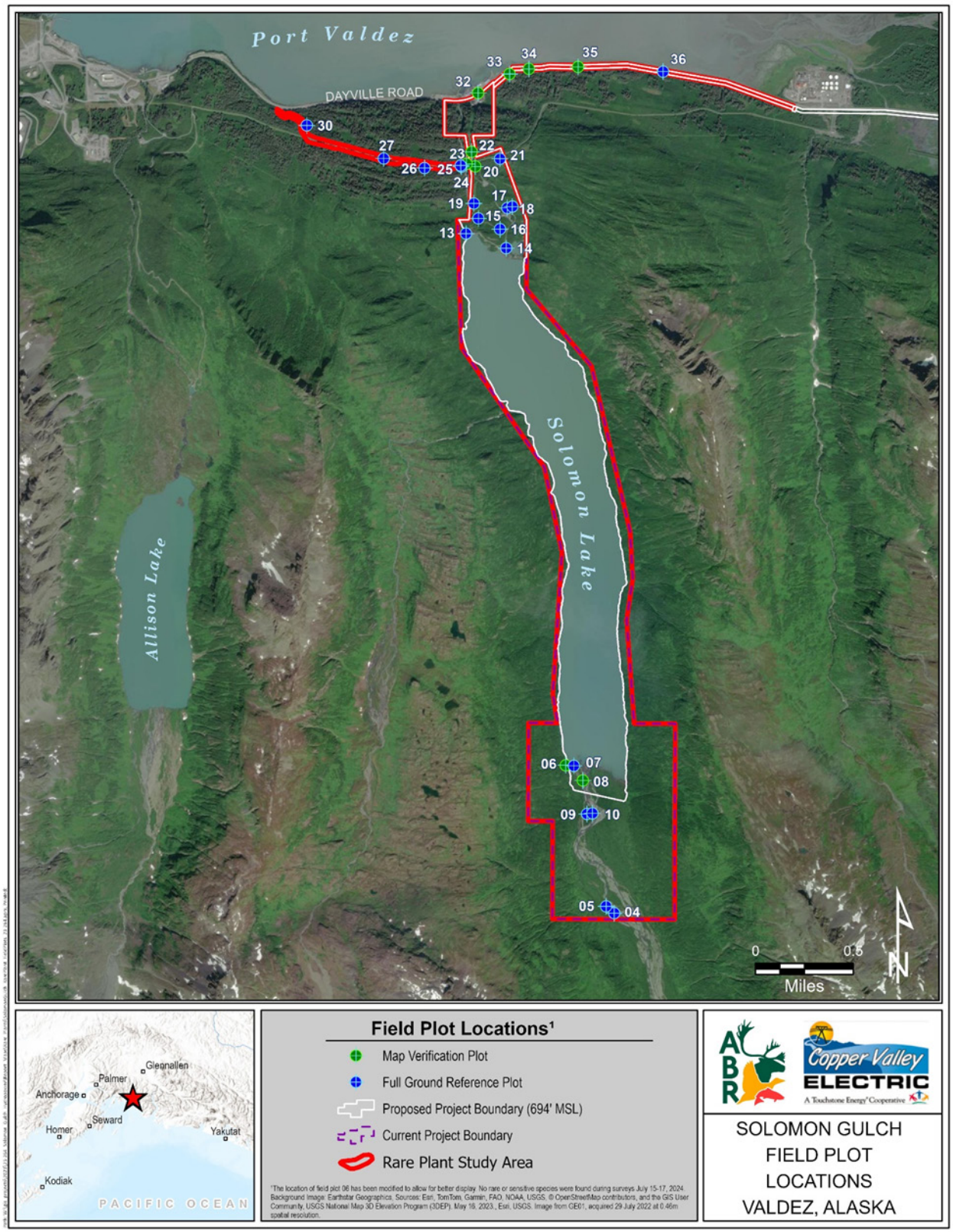

Figure 5-1 Rare and Sensitive Plant Study Field Plots

6.0 STUDY VARIANCES

The following variances were made to the Rare and Sensitive Plant Study after the FSP was developed.

6.1 Study Goals and Objectives

The following objective was identified in the FSP:

> Develop a habitat-stratified field survey plan for the focal rare and sensitive plant taxa using the fine-scale mapping of rare and sensitive plant habitats prepared in the Vegetation Characterization Study (Section 2.2).

Because of the broad nature of the habitat map and the limited time available for a field survey, a stand-alone map of rare and sensitive plant habitats was not developed. Instead, general habitats were identified for each rare plant on the focal list after reviewing source materials, and these habitats were identified and searched in the field. Once the field work was complete the provisional general field search habitats were linked to the mapped Wildlife Habitats from the Vegetation Characterization Study.

6.2 Field Methodology

The FSP identified the following process for developing a focal list of rare and sensitive species:

> Rare vascular plant collection locations within the Project Boundary and a 25-mile (40-kilometer) buffer zone surrounding it will be requested from the Alaska Rare Vascular Plant Database maintained by the ACCS. … In this study, the focal rare plant list will include those taxa listed as S1, S2, S1S2, and S2S3. Any additional Bureau of Land Management (BLM) sensitive or watchlist plant taxa noted for the Alaska region, following BLM (2019), will also be added to the focal rare plant taxa list.

A larger, 43-mile (70-kilometer) buffer zone was searched by ACCS, and the resulting list of rare and sensitive species was refined by ACCS to include those with potential habitat inside the study area. All resulting species were included on the focal list, not only those ranked S1, S2, S1S2, and S2S3. No additional species from the BLM sensitive or watch lists were added to the rare plant focal list beyond the species that met our project criteria.

7.0 STUDY SPECIFIC CONSULTATION

On November 20, 2023, CVEA filed its DSP developed for the relicensing of the Project. Stakeholders were provided 45 days to comment on the DSP. Following the comment period, CVEA filed the FSP with FERC on April 10, 2024. No comments were provided for this Rare and Sensitive Plant Study.

This Rare and Sensitive Plant Study Report is being distributed to relicensing participants for a 60-day review period. After the review period, CVEA will update the report based on comments received, and file the final report with FERC.

8.0 SUMMARY

This was a single-year study; the study has met all objectives outlined in the FSP and is complete. No additional or future rare and sensitive plant studies are proposed.

9.0 REFERENCES

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APPENDIX D

INVASIVE PLANT DRAFT STUDY REPORT

INVASIVE PLANT DRAFT STUDY REPORT

SOLOMON GULCH HYDROELECTRIC PROJECT
FERC NO. 2742

Submitted by:

Copper Valley Electric Association
Valdez, Alaska

Prepared by:

ABR, Inc.—Environmental Research & Services
Anchorage, Alaska

January 2025

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DEFINITIONS OF TERMS, ACRONYMS, AND ABBREVIATIONS

#	
3PPI	Three Parameters Plus, Inc.
A	
ABR	ABR, Inc.—Environmental Research & Services
ACCS	Alaska Center for Conservation Science
ADNR	Alaska Department of Natural Resources
AKEPIC	Alaska Exotic Plants Information Clearinghouse
C	
CVEA	Copper Valley Electric Association, Inc.
D	
DSP	Draft Study Plan
F	
FERC	Federal Energy Regulatory Commission
FSP	Final Study Plan
P	
PAD	Preliminary Application Document
Project	Solomon Gulch Hydroelectric Project
T	
TAPS	Trans Alaska Pipeline System

1.0 INTRODUCTION

Copper Valley Electric Association, Inc. (CVEA or Licensee) is the Licensee, owner, and operator of the existing 12-megawatt Solomon Gulch Hydroelectric Project, Federal Energy Regulatory Commission (FERC) Project No. 2742 (Project). The Solomon Gulch Project is a major project located on Solomon Lake near Valdez, Alaska. The original license was issued on June 21, 1978, for a term of 50 years, and expires on May 31, 2028. CVEA is pursuing a new license for the Project using the FERC Traditional Licensing Process. CVEA submitted a Pre-Application Document (PAD) and Notice of Intent on April 28, 2023.[1] A detailed description of the Solomon Gulch Project is provided in the PAD.

On November 20, 2023, CVEA filed a Draft Study Plan (DSP) with FERC[2] and distributed it to stakeholders. The DSP outlined seven studies proposed to take place in summer 2024 as part of the relicensing process. CVEA filed the Final Study Plan (FSP) with FERC on April 10, 2024 (CVEA 2024).[3]

This report describes the results of the Invasive Plant Study, which was conducted following methods described in the FSP.

Numerous invasive plant populations have been documented in the Valdez region, and invasive plants may occur in the Project area, but to date, no occurrences are documented in the Project area (Alaska Center for Conservation Science [ACCS] 2024). To address this data gap, the Invasive Plant Study developed a list of the invasive plant species likely to occur in the Project area and documented the locations and population sizes of any invasive plant occurrences found in the Project area. These data will be used to assess how the Project may potentially contribute to the spread of invasive plant species and can also be used in future monitoring and control efforts for invasive plants in the Project area.

[1] FERC Accession Number 20230428-5508.
[2] FERC Accession Number 20231120-5091.
[3] FERC Accession Number 20240410-5151.

2.0 STUDY AREA

The study area for the Invasive Plant Study encompasses all disturbed surfaces within the Project Boundary north of the spillway, including the John Hunter Memorial Trail and the transmission line between the powerhouse and the Petro Star refinery on Dayville Road, as depicted in Figure 2-1. In addition, the study area for the Invasive Plant Study extends west along the John Hunter Memorial Trail, which includes a portion of the Trans-Alaska Pipeline System (TAPS) alignment and serves as the access road for the Project. These areas are mapped as artificial fill, which are filled or recently human-modified barren surfaces including gravel access roads and laydown pads.

Figure 2-1 Solomon Gulch Invasive Plant Study Area

3.0 GOALS AND OBJECTIVES

The goal of the Invasive Plan Study is to develop current data on the existence and population sizes of any invasive plant occurrences in the Project area, which will be used in the license application to assess how Project operations may potentially exacerbate the spread of invasive plant species in the vicinity of Valdez, Alaska.

The specific objectives of the Invasive Plant Study are to:

- Establish a list of non-native and invasive vascular plant species that are likely to occur in or near the Project area. This will be referred to as the focal invasive plant list.
- Conduct a search for non-native and invasive plant species in the Project area, focusing on disturbed habitats and adjacent areas that may harbor non-native invasive plants.
- Document the locations of any non-native and invasive plant populations in the Project area and estimate their population sizes.

4.0 STUDY SCOPE AND METHODOLOGY

Roadsides, other areas of gravel fill, and disturbed habitats in and around existing facilities within the study area were identified and mapped in the Vegetation Characterization Study (Draft Study Report, Appendix B), and the field survey efforts were focused in those disturbed areas where invasive plants can become established. Directly adjacent areas of partially disturbed and undisturbed habitats were also surveyed to ensure the extent of invasive plant occurrences was fully documented.

The Invasive Plant Study area was surveyed for a focal list of 14 invasive species (Table 4-1). This focal list was created by querying the ACCS Alaska Exotic Plants Information Clearinghouse (AKEPIC) data portal (ACCS 2024) for all non-native and invasive plants within a 31-mile (50-kilometer) buffer of the Project. The resulting list of non-native and invasive plant species was reviewed in conjunction with the Alaska Department of Natural Resource (ADNR) list of prohibited and noxious weeds (ADNR 2024) and the Southeast Region Plan for the Disposal and Control of Invasive Plant Species (Three Parameters Plus, Inc. [3PPI] 2014). Plant species that were documented within 31 miles (50-kilometers) of the Project and were on either the ADNR list of prohibited and noxious weeds or listed as a species of concern by the Alaska Department of Transportation and Public Facilities (3PPI 2014) were used to develop the Project's focal list of 14 invasive plant species used in this study (Table 4-1).

All areas within the Invasive Plant Study area were traversed on foot by a botanical scientist and detailed information on focal invasive plant species was recorded. Occurrences were documented with geographic location coordinates, estimated occurrence size, and site photographs. As needed, voucher specimens were collected for identification verification by ACCS botanical staff.

The Invasive Plant Study was performed in conjunction with the Vegetation Characterization Study (Draft Study Report, Appendix B), which includes complete species lists for 21 plots and partial species lists for 10 plots. Non-native species that are not on the Invasive Plant Study focal list were recorded at these plots if they were present.

Table 4-1 Invasive Plant Species Focal List

Scientific Name	Common Name	Invasiveness Rank[1]
Alaska Department of Transportation and Public Facilities Species of Concern (3PPI 2014)		
Bromus tectorum	cheatgrass	78
Centaurea stoebe	spotted knapweed	86
Crepis tectorum	narrowleaf hawksbeard	56
Hieracium caespitosum	meadow hawkweed	79
Hordeum jubatum	foxtail barley	63
Lappula echinata (syn. *Lappula squarrosa*)	blue burr	44
Melilotus alba (syn. *Melilotus albus*)	white sweetclover	81
Plantago sp.	buckhorn plantain	44[2]
Poa annua	annual bluegrass	46
Tanacetum vulgare	common tansy	60
Vicia cracca	bird vetch	73
ADNR Prohibited and Noxious Weeds (ADNR 2024)		
Elymus repens	quackgrass	59
Galeopsis tetrahit	hempnettle	50
Hieracium aurantiacum	orange hawkweed	79

[1] Invasiveness rank assigned by ACCS (2024).
[2] Invasiveness rank for *Plantago major* (common plantain).

5.0 STUDY RESULTS AND DISCUSSION

A field survey was conducted July 16–17, 2024. The entire invasive plant study area was walked (Figure 5-1) and invasive plant data were collected. Three focal invasive plant species were observed in the study area: *Hieracium caespitosum* (meadow hawkweed), *Hordeum jubatum* (foxtail barley), and *Plantago major* (common plantain). Key characteristics of each species are provided below, as detailed in species summaries available through ACCS (ACCS 2011a, 2011b, and 2011c).

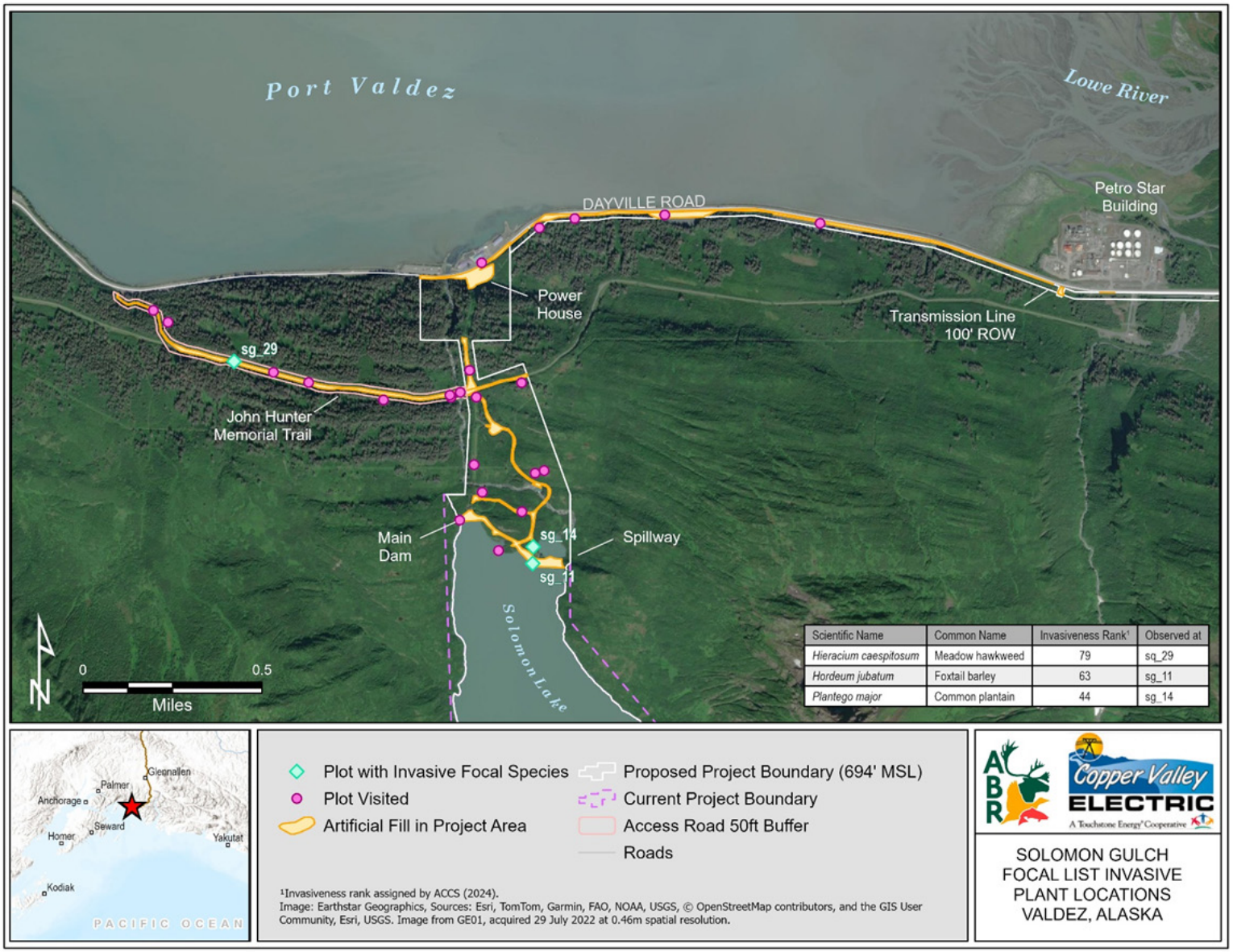


Figure 5-1 Invasive Plant Study field points and focal species locations, July 16–17, 2024

5.1 Meadow Hawkweed (*Hieracium caespitosum*)

Meadow hawkweed was observed in one location, at field plot sg_29 (see Figure 5-1 and Photo 5-1). The infestation is located on the TAPS alignment along the access road northwest of the reservoir at 61.079831, -146.323731 (datum WGS84) and is approximately 10 feet by 4 feet (3 meters by 1.2 meters) in size with approximately 25 individuals. The plant was not in flower during the field survey, and a specimen was collected and verified by Justin Fulkerson (ACCS).

Photo 5-1 Field plot sg-29 along the access road with meadow hawkweed (*Hieracium caespitosum*)

On a scale from 0 (plant poses no threat to native ecosystems) to 100 (plant poses a major threat to native ecosystems), ACCS assigned meadow hawkweed an invasiveness rank of 79 (ACCS 2011a) after considering its ecological impacts, biological attributes, distribution, and response to control measures.

Meadow hawkweed prefers full sun to partial shade and grows on well-drained and coarse soils with relatively low organic matter (ACCS 2011a). As such, it is commonly found in disturbed areas including roadsides and disturbed areas. While not listed as a noxious weed in Alaska, it is listed as noxious in Washington, Oregon, Idaho, and Montana, as well as in Quebec, Canada. Meadow hawkweed establishes dense monocultures and can outcompete native plants, and likely reduces soil moisture and nutrient availability. Mowing promotes flowering and vegetative spread, and mechanical methods (e.g., mowing, cutting, digging) do not effectively control infestations; herbicides are the most effective control treatment.

5.2 Foxtail Barley (*Hordeum jubatum*)

Foxtail barley was observed in one location, at field plot sg_11 (see Figure 5-1 and Photo 5-2). Located at the edge of the Solomon Gulch spillway, this is an area of coarse substrate fill with low vegetation cove located at 61.071744, -146.298786 (datum WGS84). Foxtail barley is present as one small, discrete population of less than 5 individuals at sg_11 and the adjacent walkway and was not observed along any other roads or trails.

Photo 5-2 Field plot sg_11 at the Solomon Gulch spillway with foxtail barley (*Hordeum jubatum*)

ACCS assigned an invasiveness rank of 63 to foxtail barley (ACCS 2011b). While palatable to grazing animals in early summer, the long and sharp awns may damage the mouths, eyes, and skin of grazing animals by late summer. Foxtail barley is not listed as noxious in anywhere in the United States, but is listed as noxious in Manitoba and Quebec, Canada. A non-rhizomatous grass, foxtail barley reproduces by seeds. Foxtail barley is salt tolerant and has become more abundant because of human activities that increase soil salinity. It is commonly found in disturbed areas, roadsides, and open fields and in places with high water tables and high salinities. Foxtail barley is difficult to eradicate once established. Planting desirable plants and controlling waters levels can reduce populations, and herbicides are effective in controlling infestations.

5.3 Common Plantain (*Plantago major*)

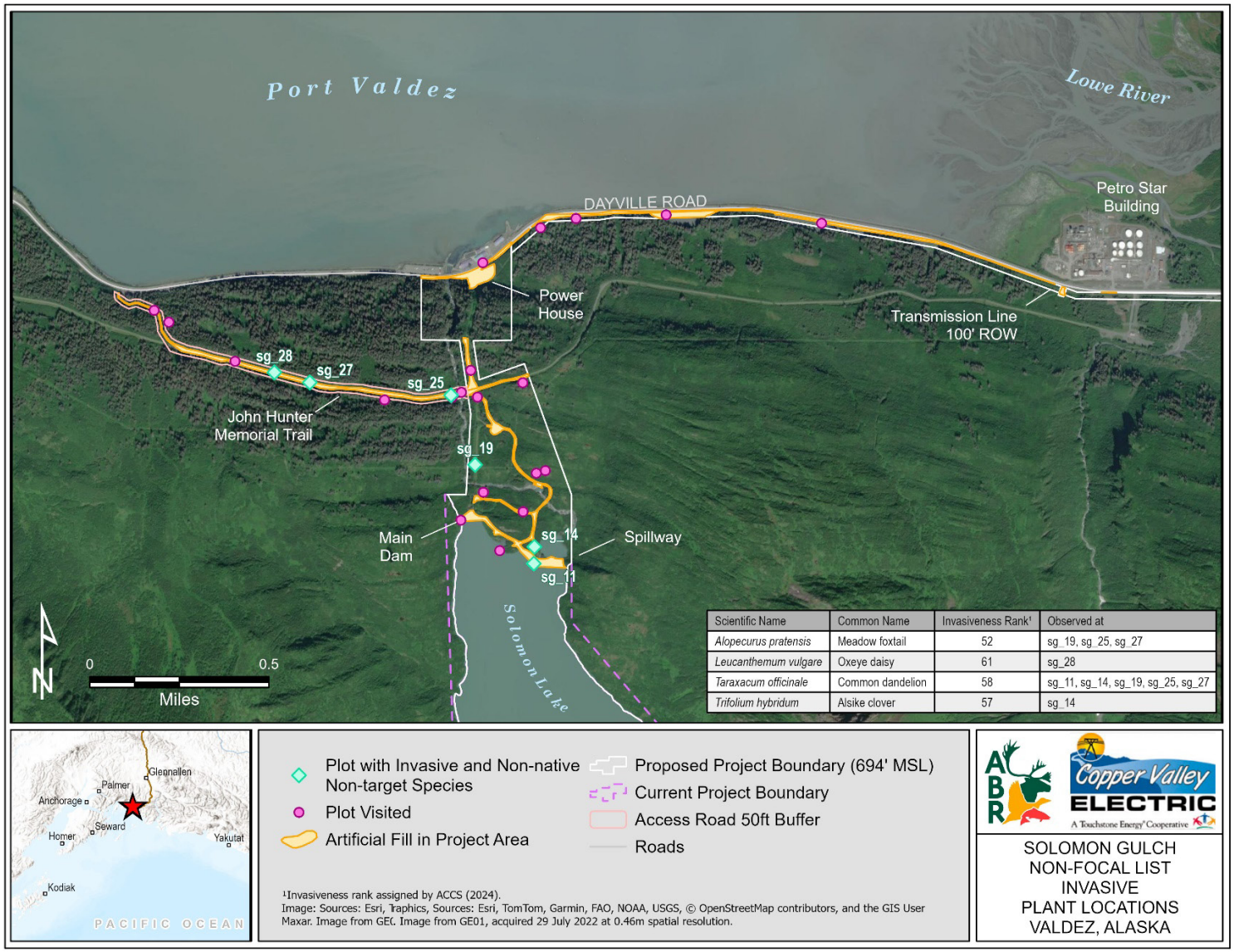
Common plantain was observed in one location, at field plot sg_14 (see Figure 5-1 and Photo 5-3). Located along the access road to the dam, one individual plant of common plantain was observed in a turnout along the road at 61.072419, -146.298742 (datum WGS84.

Photo 5-3 Field plot sg_14 along access road with common plantain (*Plantago major*)

ACCS assigned an invasiveness rank of 44 to common plantain (ACCS 2011c). Common plantain can integrate into highly disturbed habitats with low interspecific competition and is an early pioneer species that may alter successional regimes. It readily establishes in disturbed areas and can produce up to 14,000 seeds per plant that can remain viable in the soil for up to 60 years. Common plantain can be controlled through repeated pulling and by herbicides.

5.4 Additional Non-native and Invasive Plants

Additional non-native and invasive plant species were observed within the study area as part of the Vegetation Characterization Study (Draft Study Report, Appendix B), which contains complete vascular plant species lists at 21 full ground reference plots, and partial vascular plant species lists at 10 map verification plots. Additional non-native and invasive species observed at the Vegetation Characterization Study plots are summarized in Figure 5-2. No non-native or invasive plants were observed south of Solomon Lake. Non-focal species were recorded where they were within a Vegetation Characterization Study plot and are likely to be present in additional areas, particularly in disturbed areas and along routinely travelled routes.



Scientific Name	Common Name	Invasiveness Rank[1]	Observed at
Alopecurus pratensis	Meadow foxtail	52	sg_19, sg_25, sg_27
Leucanthemum vulgare	Oxeye daisy	61	sg_28
Taraxacum officinale	Common dandelion	58	sg_11, sg_14, sg_19, sg_25, sg_27
Trifolium hybridum	Alsike clover	57	sg_14

Figure 5-2 Invasive Study Field Points and Non-Focal Species Locations, July 16–17, 2024

6.0 STUDY VARIANCES

The following variances were made to the Invasive Plant Study after the FSP was developed.

6.1 Study Area

The FSP identified the following study area for the Invasive Plant Study:

> The study area for the Invasive Plant Study will encompass the Project Boundary for the Solomon Gulch Hydroelectric Project, as well as all Project features within that boundary.

This study area was revised to include only disturbed lands within the Project Boundary. Because of the limited time for a field survey, efforts were focused on disturbed areas where non-native and invasives species are more likely to be present. Complete species inventories were documented at each plot surveyed as part of the Vegetation Characterization Study (Draft Study Report, Appendix B), which encompassed an 820-foot (250-meter) buffer zone surrounding the Project Boundary and access road. No focal or non-focal non-native or invasive species were observed outside of the Invasive Plant Study area.

6.2 Field Methodology

The study plan identified the following process for defining a focal list of invasive vascular plants for this survey:

> Non-native and invasive vascular plant collection locations within the Project Boundary and a 5-mile buffer zone surrounding it will be requested from the AKEPIC database of non-native plant species maintained by the Alaska Center for Conservation Science (ACCS 2024). A 5-mile buffer size will be used to capture the records of non-native plant collections in the Valdez area, which are clustered in the town of Valdez proper and along the Richardson Highway; currently there are no records along Dayville Road in the vicinity of the Project (ACCS 2024). These data will be used to develop a preliminary list of focal invasive plant species for the field survey. Other invasive species likely to occur in and near Valdez but may not

have yet been collected in the area will also be added to the focal invasive plant species list. The focal list will then be used to guide the field survey effort.

Instead of the focal list methodology identified in the study plan, this study incorporated a broader geographic search of the AKEPIC database (ACCS 2024), and then refined this list to focus on invasive species of concern by the Alaska Department of Transportation and Public Facilities (3PPI 2014) and ADNR list of prohibited and noxious weeds (ADNR 2024). This reduced focal species list allowed the field crew to survey the entire study area within the limited time allotted to a field survey.

7.0 STUDY SPECIFIC CONSULTATION

On November 20, 2023, CVEA filed its DSP developed for the relicensing of the Project. Stakeholders were provided 45 days to comment on the DSP. Following the comment period, CVEA filed the FSP with FERC on April 10, 2024. No comments were provided for this Invasive Plant Study.

This Invasive Plant Draft Study Report is being distributed to relicensing participants for a 60-day review period. After the review period, CVEA will update the report based on comments received, and file the final report with FERC.

8.0 SUMMARY

This was a single-year study; the study has met all objectives outlined in the FSP and is complete. Specifically, this study provides an assessment of the invasive plants within the Project area, no additional or future invasive plant studies are proposed.

9.0 REFERENCES

Alaska Center for Conservation Science (ACCS). 2011a. Orange hawkweed (*Hieracium aurantiacum* L.) and meadow hawkweed (*Hieracium caespitosum* Dumort.). Accessible at: https://accs.uaa.alaska.edu/wp-content/uploads/Hieracium_caespitosum_BIO_HICA10.pdf. Accessed October 2024.

_____. 2011b. Foxtail barley (*Hordeum jubatum* L.). Accessible at: https://accs.uaa.alaska.edu/wp-content/uploads/Hordeum_jubatum_BIO_HOJU.pdf. Accessed October 2024.

_____. 2011c. Common plantain (*Plantago major* L.). Accessible at: https://accs.uaa.alaska.edu/wp-content/uploads/Plantago_major_BIO_PLMA2.pdf. Accessed October 2024.

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Copper Valley Electric Association (CVEA). 2024. Final Study Plan: Solomon Gulch Hydroelectric Project FERC No. 2742. Prepared by Kleinschmidt, submitted by VEA. April 2024. 85pp.

Three Parameters Plus, Inc. (3PPI). 2014. Disposal and Control of Invasive Plant Species. Prepared for Alaska Department of Transportation and Public Facilities, Southeast Region. 64 pp.

APPENDIX E

WILDLIFE HABITAT EVALUATION DRAFT STUDY REPORT

WILDLIFE HABITAT EVALUATION DRAFT STUDY REPORT

SOLOMON GULCH HYDROELECTRIC PROJECT
FERC NO. 2742

Submitted by:

Copper Valley Electric Association
Valdez, Alaska

Prepared by:

ABR, Inc.—Environmental Research & Services
Anchorage, Alaska

January 2025

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DEFINITIONS OF TERMS, ACRONYMS, AND ABBREVIATIONS

A	
ABR	ABR, Inc.—Environmental Research & Services
ADF&G	Alaska Department of Fish and Game
B	
BLM	Bureau of Land Management
C	
CVEA	Copper Valley Electric Association, Inc.
D	
DSP	Draft Study Plan
F	
FERC	Federal Energy Regulatory Commission
FSP	Final Study Plan
P	
PAD	Pre-Application Document
Project	Solomon Gulch Hydroelectric Project
S	
Solomon Gulch Project	Solomon Gulch Hydroelectric Project
U	
USFWS	U.S. Fish and Wildlife Service

1.0 INTRODUCTION

Copper Valley Electric Association, Inc. (CVEA or Licensee) is the Licensee, owner, and operator of the existing 12-megawatt Solomon Gulch Hydroelectric Project, Federal Energy Regulatory Commission (FERC) Project No. 2742 (Project). The Solomon Gulch Project is a major project located on Solomon Lake near Valdez, Alaska. The original license was issued on June 21, 1978, for a term of 50 years, and expires on May 31, 2028. CVEA is pursuing a new license for the Project using the FERC Traditional Licensing Process. CVEA submitted a Pre-Application Document (PAD) and Notice of Intent on April 28, 2023.[1] A detailed description of the Solomon Gulch Project is provided in the PAD.

On November 20, 2023, CVEA filed a Draft Study Plan (DSP) with FERC[2] and distributed it to stakeholders. The DSP outlined seven studies proposed to take place in summer 2024 as part of the relicensing process. CVEA filed the Final Study Plan (FSP) with FERC on April 10, 2024 (CVEA 2024).[3]

This report describes the results of the Wildlife Habitat Evaluation Study, which was conducted following methods described in the FSP.

Little is known about the wildlife species that occur in the Solomon Gulch Project area and how those species may use the available habitats. To address these data gaps, a Wildlife Habitat Evaluation Study was conducted in collaboration with the Vegetation Characterization Study (Draft Study Report, Appendix B) to develop information on the expected occurrence and habitat use of wildlife species of concern in the Project area. Habitat values for those species were assigned to the habitats mapped in the area to identify the habitats of most important for each species.

[1] FERC Accession Number 20230428-5508.
[2] FERC Accession Number 20231120-5091.
[3] FERC Accession Number 20240410-5151.

2.0 STUDY AREA

The study area for the Wildlife Habitat Evaluation Study is the same as used in the Vegetation Characterization Study and encompasses the Solomon Gulch Project Boundary, as depicted in Figure 2-1, and the portion of the John Hunter Memorial Trail between Dayville Road and the Project Boundary which serves as the Project's access road. The study area also included a 250-meter (820-foot) buffer zone surrounding the Project Boundary and access road to place the resulting habitat evaluation data within a local landscape context.

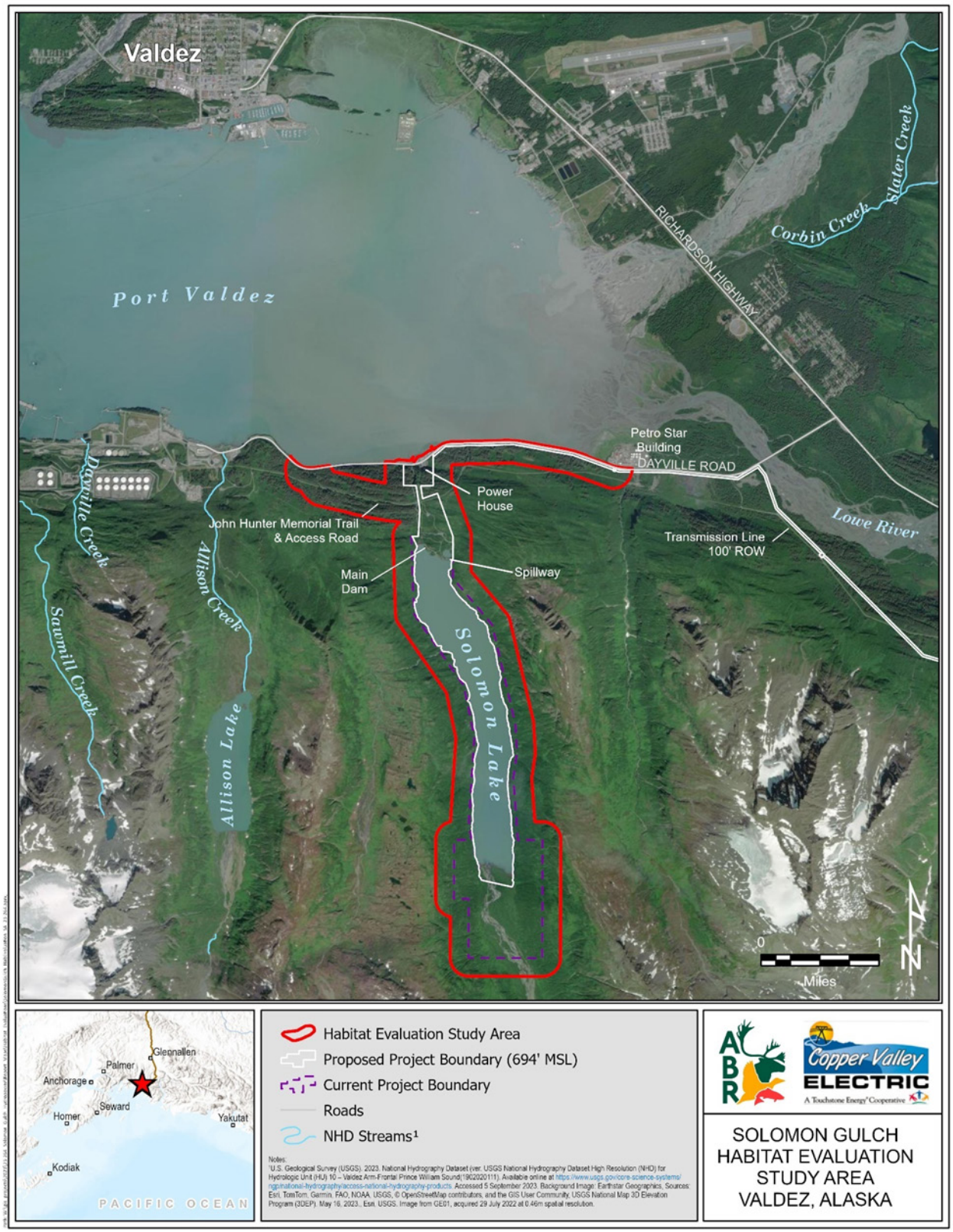

Figure 2-1 Solomon Gulch Wildlife Habitat Evaluation Study Area

3.0 GOALS AND OBJECTIVES

The goals of the Wildlife Habitat Evaluation Study were to develop a list of wildlife species (birds and mammals) of concern that are known or expected to occur in the study area, and to identify the habitats of most importance for those species. The information on the importance of wildlife habitat types provides the data needed to assess possible impacts to wildlife habitats that could occur from Project operations.

The specific objectives of the Wildlife Habitat Evaluation Study were to:

- Assemble habitat-use information for wildlife species of concern that applies to the habitats mapped in the study area from findings in the peer-reviewed scientific literature, unpublished research reports, and wildlife survey data and habitat-use information collected for CVEA's nearby Allison Creek Hydroelectric Project (ABR, Inc.—Environmental Research & Services [ABR] 2011).
- Categorically rank habitat values (negligible, low, moderate, and high value) for each of the wildlife species of concern for each of the wildlife habitat types mapped in the study area in the Vegetation Characterization Study (Draft Study Report, Appendix B).

4.0 STUDY SCOPE AND METHODOLOGY

The first step in categorizing habitat values for the wildlife species assessed in this study was the development of a set of wildlife habitats specific to the Solomon Gulch Project area. Using a combination of vegetation type and other landscape features that are important for wildlife, 17 wildlife habitats were defined and mapped in the study area in the Vegetation Characterization Study (Draft Study Report, Appendix B).

Mapped wildlife habitats were then assessed for habitat use and habitat value for a set of focal wildlife species considered to be of conservation or ecological importance. The list of focal wildlife species of concern was generated initially using the 38 species assessed in the habitat evaluation conducted for the nearby Allison Creek Hydroelectric Project (ABR 2011). Because the Allison Creek watershed is separated by a single ridgeline from the Solomon Gulch watershed and has very similar landscape features, it is expected that the wildlife habitats and wildlife species using the Solomon Gulch Project area will be similar.

The list of 38 species from Allison Creek was revised for the Solomon Gulch Project area in March 2024 to ensure that protected species (e.g., eagles) and other species of conservation concern and ecological importance were included. Species of conservation concern were determined from the At-Risk Species listed in the Alaska Department of Fish and Game (ADF&G) 2015 Alaska Wildlife Action Plan (ADF&G 2015), the Birds of Conservation Concern listed for Bird Conservation Region 5 in Alaska (U.S. Fish and Wildlife Service [USFWS] 2021), and Sensitive Species from the Bureau of Land Management (BLM) list of Special Status Species for Alaska (BLM 2019). Species that only occur sporadically (not annually and often as lone individuals) were omitted because population-level impacts on such species from relicensing the Solomon Gulch Project will be negligible. Two additional mammal species, brown bear and black bear, were included as focal species for their ecological importance and the potential for human interactions within the Project area. Lastly, consultations with the ADF&G and USFWS resulted in four additional bird and three mammal species being included on the focal species list because of their ecological importance.

The final list of 36 species to be assessed for habitat values includes 31 bird and five mammal species (Table 4-1). Each of these species is known or expected to occur regularly in the wildlife habitats present in the adjacent Allison Creek basin and/or is known to occur more broadly in the Valdez area, and by extension, is likely to occur in the Solomon Gulch study area.

Table 4-1 List of focal species assessed in the Solomon Gulch Wildlife Habitat Evaluation

Common Name	Scientific Name	ADF&G At-Risk Species[a]	USFWS BCC for BCR5[b]	BLM Sensitive Species[c]
Rufous Hummingbird	*Selasphorus rufus*	x	x	
Black Oystercatcher[d]	*Haematopus bachmani*	x	x	
Short-billed Dowitcher[d]	*Limnodromus griseus*	x	x	
Lesser Yellowlegs	*Tringa flavipes*	x	x	
Marbled Murrelet	*Brachyramphus marmoratus*	x	x	
Kittlitz's Murrelet	*Brachyramphus brevirostris*	x	x	x
Black-legged Kittiwake[d]	*Rissa tridactyla*			
Red-throated Loon	*Gavia stellata*	x		x
Golden Eagle[e]	*Aquila chrysaetos*	x		
Northern Harrier	*Circus hudsonius*	x		
Bald Eagle[e]	*Haliaeetus leucocephalus*			
Red-tailed Hawk	*Buteo jamaicensis*	x		
Boreal Owl	*Aegolius funereus*	x		
Belted Kingfisher	*Megaceryle alcyon*	x		
Olive-sided Flycatcher[d]	*Contopus cooperi*	x	x	x
Chestnut-backed Chickadee	*Poecile rufescens*	x	x	
Tree Swallow	*Tachycineta bicolor*	x		
Golden-crowned Kinglet	*Regulus satrapa*	x		
Pacific Wren	*Troglodytes pacificus*	x		
Varied Thrush	*Ixoreus naevius*	x	x	
American Pipit	*Anthus rubescens*	x		
Common Redpoll	*Acanthis flammea*	x		
Pine Siskin	*Spinus pinus*	x		
Snow Bunting	*Plectrophenax nivalis*	x		
Fox Sparrow	*Passerella iliaca*	x		
American Tree Sparrow	*Spizelloides arborea*	x		
Savannah Sparrow	*Passerculus sandwichensis*	x		
Song Sparrow	*Melospiza melodia*	x		
Orange-crowned Warbler	*Leiothlypis celata*	x		

Common Name	Scientific Name	ADF&G At-Risk Species[a]	USFWS BCC for BCR5[b]	BLM Sensitive Species[c]
Yellow Warbler	*Setophaga petechia*	x		
Wilson's Warbler	*Cardellina pusilla*	x		
Little Brown Bat[d]	*Myotis lucifugus*			
Black Bear[f]	*Ursus americanus*			
Brown Bear[f]	*Ursus arctos*			
River Otter[g]	*Lontra canadensis*			
Wolverine[g]	*Gulo gulo*			

[a] At-Risk Species from ADF&G (2015).
[b] Birds of Conservation Concern for Bird Conservation Region 5 from USFWS (2021).
[c] Sensitive Species from BLM (2019).
[d] USFWS request.
[e] Protected under the Bald and Golden Eagle Protection Act.
[f] Potential for human interactions in Project area.
[g] ADF&G request.

Both distributional and habitat-use information were synthesized to evaluate the value of each habitat for each focal species. Distributional information was obtained from ADF&G species profiles (ADF&G 2024) and large-scale analytically derived bird distribution maps (Fink et al. 2023). Habitat use information was compiled from the published literature and research reports (Attachment A) and was supplemented, when needed, with the professional judgement of ABR wildlife biologists who have decades of experience surveying birds and mammals throughout Alaska. Field studies from 2008–2010 and a wildlife habitat evaluation conducted for the adjacent Allison Creek Hydroelectric Project (ABR 2011) also provided distributional and habitat-use information for some focal species.

The wildlife habitat-use evaluations were conducted by creating matrices of the focal species and the mapped habitats, and assigning a categorical habitat-value ranking to each mapped wildlife habitat type for each focal species. For each habitat and focal species, habitat value was ranked as none/negligible (coded as 0), low (1), moderate (2), or high (3) based on a qualitative evaluation from the data synthesis (Table 4-2). High-value habitats are those known to be important seasonally; for example, habitats used during the breeding season for nesting, denning, and/or rearing, or, for mammals, habitats important during winter for foraging or escape. Moderate-value habitats are those used regularly in any season but are less important, being used by fewer individuals, or representing one of several available habitats that are used similarly by the species. For

birds, habitats that are only used for feeding are considered moderate value unless feeding in the specific habitat is part of essential life stage (e.g., pre-migration staging areas). Low-value habitats are those used only rarely by the species under consideration, while negligible-value habitats are unsuitable and not expected to be used. In cases where only a small portion of a particular habitat occurs within the study area and would be expected to see moderate use by a focal species (if the full extent of the habitat patch was present), the habitat was considered low value because of the small areal coverage.

The combination of high- and moderate-value habitats represents those habitats that are expected to be regularly used by wildlife (see also Marcot et al. 2015) and are considered the important habitats for a given focal species.

Table 4-2 Habitat-Value Class Descriptions for the Wildlife Habitat Evaluation

Wildlife Group	Ranking Score	Habitat-Value Class	Description
Birds	3	High	Known to be frequently used for nesting and/or foraging/hunting during the breeding season, or by migrating birds, and in winter by resident species.
	2	Moderate	Moderate-value habitats may be regularly used during the breeding, migration, or wintering seasons for foraging/hunting, but less so than high-value habitats.
	1	Low	Low-value habitats would see little use by the species under consideration and in very low numbers.
	0	Negligible	The species is not expected to occur or will very rarely occur in negligible-value habitats.
Mammals	3	High	Known to be frequently used for breeding, shelter, denning, overwintering, and/or foraging/hunting during some portion of the year.
	2	Moderate	Moderate-value habitats may be regularly used for foraging/hunting and as travel corridors, but less so than high-value habitats.
	1	Low	Low-value habitats would see little use by the species under consideration and in very low numbers.
	0	Negligible	The species is not expected to occur or will very rarely occur in negligible-value habitats.

5.0 STUDY RESULTS AND DISCUSSION

A total of 17 wildlife habitats (Figure 5-1) were assessed for their value to 36 focal wildlife species. Focal species included 3 shorebirds, 4 seabirds/waterbirds, 5 raptors, 19 landbirds, 1 bat, 2 bears, and 2 mustelid mammals. Upland and alpine/subalpine habitats are widespread throughout the study area and were typically considered to be of higher value. Aquatic habitats were generally categorized as lower value for the primarily terrestrial focal species addressed, and those habitats that occur only in small patches were considered to be lower value for mobile vertebrate species that make use of broad areas on the landscape.

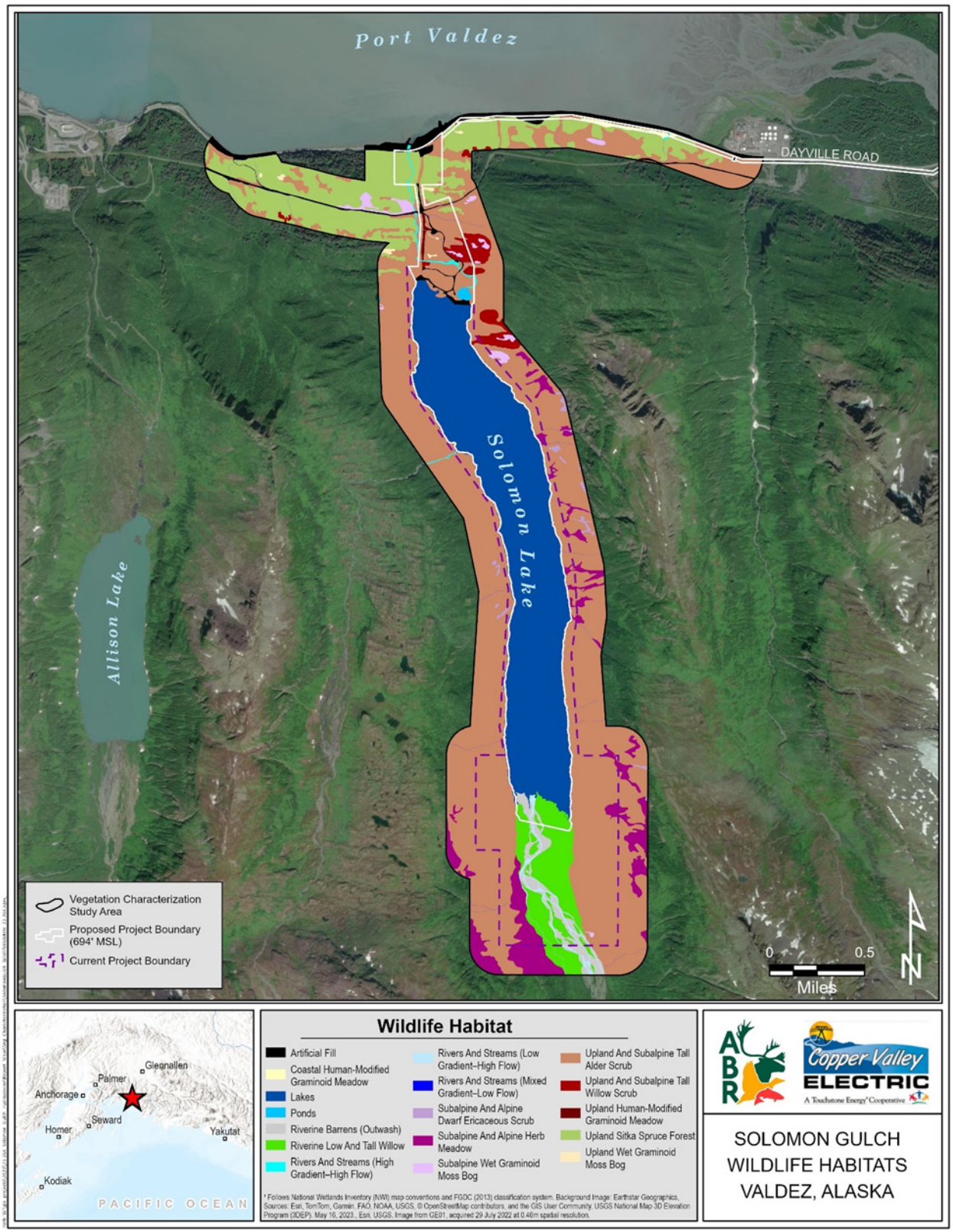

Figure 5-1 Wildlife Habitats in the Wildlife Evaluation Study Area

5.1 Shorebirds

There is no high-value habitat for shorebirds within the study area, although some moderate-value habitat is present (Table 5-1). Black Oystercatchers inhabit strictly coastal areas (Andres and Falxa 2020), and the rocky coast in the Artificial Fill habitat is the only area where this species would occur in the study area. Moderate-value habitat for Short-billed Dowitchers and Lesser Yellowlegs occurs in most aquatic habitats within the study area. Short-billed Dowitchers are chiefly coastal (Jehl et al. 2020), so the only moderate-value habitat occurs in coastal areas, where this species may feed occasionally, and some low-value habitat occurs along the shores of ponds and lakes further inland. Lesser Yellowlegs use a wider variety of habitats (Tibbitts and Moskoff 2020), and most shoreline and wet habitats provide moderate-value habitat. Although nesting dowitchers and yellowlegs may use some of these habitats for breeding, habitat patches within the study area are too small to support these nesting shorebirds. (Table 5-1).

5.2 Seabirds/Waterbirds

Most seabirds nest in areas inaccessible to predators, which are scarce in the study area, and little high-value habitat exists within the study area (Table 5-1). In Alaska, Marbled Murrelets nest in either conifer forests or on rocky scree slopes or cliffs (Nelson 2020). Previous field studies documented Marbled Murrelets occurring in the adjacent Allison Creek Basin, but nests were never found. However, the large Sitka spruce trees within the study area provide potential high-value nesting habitat. Kittlitz's Murrelets nest on rocky scree slopes or cliffs (Day et al. 2020), which do not exist in the study area. Since both murrelet species feed in marine environments, no other suitable habitats exist for either species in the study area. Black-legged Kittiwakes only nest on coastal cliffs, typically on islands (Hatch et al. 2020), which do not exist within the study area.

Kittiwakes feed in marine environments, and they may rest on the Artificial Fill rocky coast in small numbers. Red-throated Loons prefer to nest in low elevation ponds or wetlands, but they will occasionally nest at higher elevations (Rizzolo et al. 2020) and earlier field studies found a Red-throated Loon nest on an island in Allison Lake (ABR 2011). Since Solomon Lake lacks any islands and the only pond in the Project area does not have nearby wetlands, these two habitats only provide moderate value to Red-throated Loons.

Table 5-1 Habitat evaluation matrix for focal wildlife species within the Solomon Gulch Project area

Species	Scientific Name	Lakes	Ponds	Coastal Human-Modified Graminoid Meadow	Rivers And Streams (High Gradient-High Flow)	Rivers And Streams (Low Gradient-High Flow)	Rivers and Streams (Mixed Gradient-Low Flow)	Riverine Barrens (Outwash)	Riverine Low and Tall Willow	Upland Wet Graminoid Moss Bog	Upland Human-Modified Graminoid Meadow	Upland and Subalpine Tall Willow Scrub	Upland and Subalpine Tall Alder Scrub	Upland Sitka Spruce Forest	Subalpine Wet Graminoid Moss Bog	Subalpine And Alpine Herb Meadow	Subalpine And Alpine Dwarf Ericaceous Scrub	Artificial Fill
Rufous Hummingbird	*Selasphorus rufus*	0	0	1	0	0	0	0	0	1	1	2	2	3	1	1	1	1
Belted Kingfisher	*Megaceryle alcyon*	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
Olive-sided Flycatcher	*Contopus cooperi*	0	1	1	0	0	0	0	1	2	1	1	1	3	1	0	0	0
Chestnut-backed Chickadee	*Poecile rufescens*	0	0	0	0	0	0	0	0	0	0	0	1	3	0	0	0	0
Tree Swallow	*Tachycineta bicolor*	2	2	2	0	1	0	1	0	1	1	0	0	0	2	1	0	1
Golden-crowned Kinglet	*Regulus satrapa*	0	0	0	0	0	0	0	0	0	0	1	1	3	0	0	0	0
Pacific Wren	*Troglodytes pacificus*	0	0	1	1	0	0	0	0	0	1	1	1	3	0	0	0	1
Varied Thrush	*Ixoreus naevius*	0	0	0	0	0	0	0	2	0	0	2	2	3	0	0	0	0
American Pipit	*Anthus rubescens*	1	1	1	0	0	0	1	0	0	1	0	0	0	0	1	2	1
Redpoll	*Acanthis flammea*	0	0	1	0	0	0	0	3	1	1	3	3	2	0	1	3	1
Pine Siskin	*Spinus pinus*	0	0	0	0	0	0	0	1	0	0	1	2	3	0	0	0	0

Species	Scientific Name	Lakes	Ponds	Coastal Human-Modified Graminoid Meadow	Rivers And Streams (High Gradient-High Flow)	Rivers And Streams (Low Gradient-High Flow)	Rivers and Streams (Mixed Gradient-Low Flow)	Riverine Barrens (Outwash)	Riverine Low and Tall Willow	Upland Wet Graminoid Moss Bog	Upland Human-Modified Graminoid Meadow	Upland and Subalpine Tall Willow Scrub	Upland and Subalpine Tall Alder Scrub	Upland Sitka Spruce Forest	Subalpine Wet Graminoid Moss Bog	Subalpine And Alpine Herb Meadow	Subalpine And Alpine Dwarf Ericaceous Scrub	Artificial Fill
Snow Bunting	*Plectrophenax nivalis*	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1	1	1
Fox Sparrow	*Passerella iliaca*	0	0	0	0	0	0	0	3	0	0	3	3	2	0	2	0	0
American Tree Sparrow	*Spizelloides arborea*	0	0	0	0	0	0	0	3	0	0	3	3	0	0	1	0	0
Savannah Sparrow	*Passerculus sandwichensis*	0	0	1	0	0	0	2	0	0	1	1	1	0	2	2	3	1
Song Sparrow	*Melospiza melodia*	0	0	1	0	0	0	0	0	1	1	2	2	3	1	0	0	2
Orange-crowned Warbler	*Leiothlypis celata*	0	0	0	0	0	0	0	2	0	0	3	3	2	0	1	0	0
Yellow Warbler	*Setophaga petechia*	0	0	0	0	0	0	0	2	0	0	3	3	1	0	0	0	0
Wilson's Warbler	*Cardellina pusilla*	0	0	0	0	0	0	0	3	0	0	3	3	3	0	0	0	0
Golden Eagle	*Aquila chrysaetos*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2	0
Northern Harrier	*Circus hudsonius*	0	0	1	0	1	0	1	0	1	1	0	0	0	1	1	1	1
Bald Eagle	*Haliaeetus leucocephalus*	1	1	0	0	1	0	0	0	0	0	0	0	3	0	0	0	1
Red-tailed Hawk	*Buteo jamaicensis*	0	0	2	0	0	0	0	0	1	2	0	0	3	1	1	1	0
Boreal Owl	*Aegolius funereus*	0	0	1	0	0	0	0	0	1	1	0	0	2	0	0	0	0

Species	Scientific Name	Lakes	Ponds	Coastal Human-Modified Graminoid Meadow	Rivers And Streams (High Gradient-High Flow)	Rivers And Streams (Low Gradient-High Flow)	Rivers and Streams (Mixed Gradient-Low Flow)	Riverine Barrens (Outwash)	Riverine Low and Tall Willow	Upland Wet Graminoid Moss Bog	Upland Human-Modified Graminoid Meadow	Upland and Subalpine Tall Willow Scrub	Upland and Subalpine Tall Alder Scrub	Upland Sitka Spruce Forest	Subalpine Wet Graminoid Moss Bog	Subalpine And Alpine Herb Meadow	Subalpine And Alpine Dwarf Ericaceous Scrub	Artificial Fill
Marbled Murrelet	*Brachyramphus marmoratus*	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0
Kittlitz's Murrelet	*Brachyramphus brevirostris*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Black-legged Kittiwake	*Rissa tridactyla*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Red-throated Loon	*Gavia stellata*	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Black Oystercatcher	*Haematopus bachmani*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Short-billed Dowitcher	*Limnodromus griseus*	1	1	2	0	0	0	0	0	0	1	0	0	0	0	0	0	1
Lesser Yellowlegs	*Tringa flavipes*	2	2	2	0	2	0	2	1	1	2	0	0	0	1	0	0	1
Little Brown Bat	*Myotis lucifugus*	2	2	2	2	1	1	2	1	1	1	1	1	2	1	1	1	2
Black Bear	*Ursus americanus*	0	0	1	1	2	0	2	2	1	1	3	3	2	1	3	3	0
Brown Bear	*Ursus arctos*	0	0	1	1	2	0	2	2	1	1	2	2	2	1	3	3	0
River Otter	*Lontra canadensis*	1	1	1	1	2	1	1	0	0	0	0	0	3	0	0	0	1
Wolverine	*Gulo gulo*	0	0	0	0	1	1	1	1	1	1	1	1	2	1	2	2	0

5.3 Raptors

The study area provides moderate- to high-value nesting and/or feeding habitat for four of the five focal raptor species (Table 5-1). Golden Eagles nesting in Alaska prefer cliff habitat, which is absent from the study area, however open alpine habitats provide low- to moderate-value for hunting opportunities (Katzner et al. 2020). Northern Harriers nest and feed in either alpine tundra or expansive lowland meadow and wetland habitats (Smith et al. 2020), and these habitats are either absent, or occur as very small low-value patches within the study area. Bald Eagles nest in tall trees, typically near fish-bearing waters (Buehler 2022), and previous field studies found two active Bald Eagle nests in Sitka spruce within the study area (ABR 2011). The Sitka spruce forest provides high-value nesting habitat, and nearby open stagnant or slow-moving water provides low-value feeding habitat and artificial fill along the coast provides low-value resting habitat for Bald Eagles feeding in the more productive waters of Port Valdez. Red-tailed Hawks nest in spruce and other conifer forests in Alaska (Preston and Beane 2020), and a pair was suspected of nesting in nearby Sitka spruce during field studies conducted in the Alison Creek basin (ABR 2011). High-value Sitka spruce habitat occurs in the study area, and most other open habitats provide low- to moderate-value habitat for feeding. Boreal Owls nest in closed canopy deciduous and mixed forests with numerous clearings (Hayward and Hayward 2020), and they prefer areas with fewer shrubs (Domahidi et al. 2019). The Sitka spruce forest provides moderate-value nesting habitat surrounded by low-value open habitats for feeding for Boreal Owls.

5.4 Landbirds

The study area contains high- or moderate-value nesting habitats for 18 of the 19 focal landbirds, including alpine nesting, spruce forest nesting, shrubland nesting, and water associated species (Table 5-1).

Alpine nesting – Subalpine and Alpine Dwarf Ericaceous Scrub habitat provides nesting opportunities for American Pipits, Savannah Sparrows, and Redpolls (Hendricks and Verbeek 2020, Knox and Lowther 2020, Wheelwright and Rising 2020). American Pipits generally prefer rockier terrain, and they were not detected in this habitat during field studies conducted in the adjacent Allison Creek basin (ABR 2011), so this habitat was scored as moderate-value for this species. However, both Redpolls and Savannah Sparrows were detected in this habitat during previous Allison Creek field studies, and this habitat was scored as high-value for these species. Snow Buntings are an alpine

nesting species that require rocky terrain for breeding, which is absent from the study area (Montgomerie and Lyon 2020), although some may use sparsely vegetated habitats at lower elevations during migration. Snow Buntings are the one focal species with no moderate- or high-value habitat within the study area.

Spruce forest nesting – Rufous Hummingbirds, Olive-sided Flycatchers, Chestnut-backed Chickadees, Golden-crowned Kinglets, Pacific Wrens, Varied Thrushes, Pine Siskins, Song Sparrows, and Wilson's Warblers all nest in Sitka spruce habitat. Some species, including Varied Thrushes, Song Sparrows, and Wilson's Warblers can use a variety of habitats for nesting, while other species, including Chestnut-backed Chickadees, Golden-crowned Kinglets, and Pacific Wrens nest only in the Sitka spruce habitat. As an example of the distribution of important habitats for a forest-specialist species of conservation concern (Altman and Sallabanks 2020), the high- and moderate-value habitats that could be used regularly by Olive-sided Flycatchers in the study area is illustrated in Figure 5-2. For this species, the important forest habitats are all located at lower elevations near the coast. Other forest-dwelling species of birds assessed in this study will almost certainly exhibit a very similar distribution of important habitats.

Shrubland nesting – A variety of shrubby habitats are of high-value for nesting Redpolls, Fox and American Tree Sparrows, and Orange-crowned, Yellow, and Wilson's Warblers. All six of these species were commonly detected in Upland and Subalpine Tall Alder Scrub and four of these species were detected in Riverine Low and Tall Willow during previous field surveys conducted in the adjacent Alison Creek basin (ABR 2011).

Water Associated – Belted Kingfishers are water obligate landbirds that feed in clear standing or slow-moving water and nest in burrows dug into vertical banks or exposed dirt (Sullivan et al. 2006, Kelly et al. 2020). Since vertical banks are uncommon or absent along the shorelines of streams and lakes in the study area, only low- or negligible-value nesting habitat for kingfishers is available. Similarly, because physical barriers to movements of anadromous and resident fish species in lower Solomon Gulch Creek prohibit fish presence upstream in Solomon Lake and its tributary streams (CVEA 2023), those waterbodies will provide only negligible-value foraging habitat for kingfishers. Some foraging for resident fish species that occur in lower Solomon Lake and its tributary streams (CVEA 2023) is possible, but the fast-moving water will result in only low-value foraging habitat. Tree swallows are most commonly seen foraging for insects in the air directly over waterbodies. However, they also forage aerially over meadows (Winkler et al. 2020.

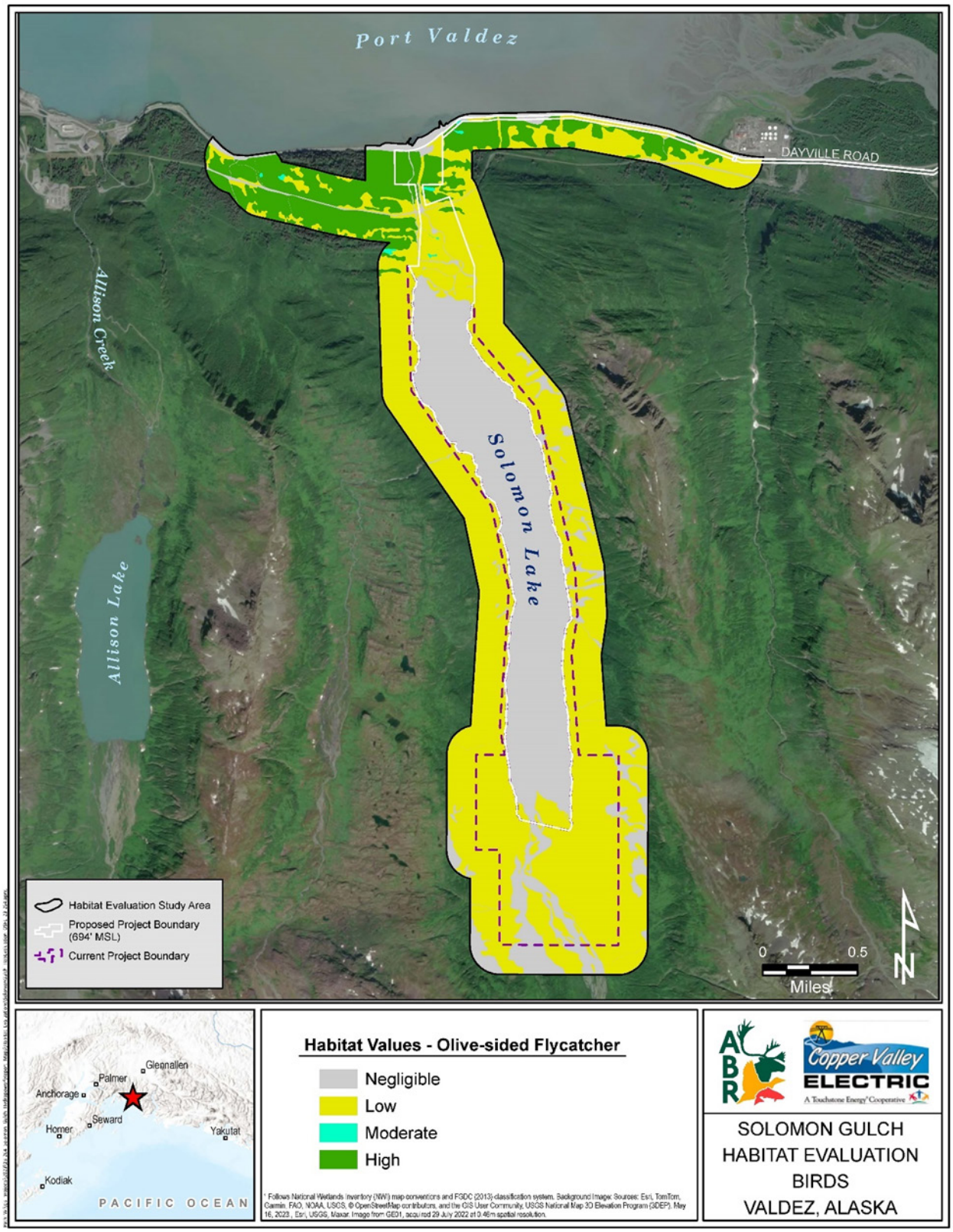

Figure 5-2 Distribution and extent of available habitats for Olive-sided Flycatchers in the four habitat-value ranking categories

5.5 Mammals

While the study area has a lower diversity and density of mammalian focal species, it contains high-value habitats for several species (Table 5-1). Little brown bats commonly roost in man-made structures (Tessler et al. 2014) but have also been documented roosting in Sitka spruce snags, although hardwood forests are preferred over coniferous forests (Loeb et al. 2014). These bats commonly feed over water and in riparian areas near forests (Loeb et al. 2014, Snively et al. 2021). Most low elevation aquatic habitats, as well as Sitka spruce, are of moderate-value to bats, and other open habitats provide lower value feeding habitats.

Both black and brown bears can use a wide variety of habitats found within the study area (Goldstein et al. 2010, Partridge et al. 2009, Schoen and Beier 1990). Brown bears on the Kenai Peninsula denned at sites that averaged twice as far from roads as the most remote site within the study area, on steep terrain at high elevation (Goldstein et al. 2010). Black bears in interior Alaska use a variety of habitats for denning with a preference for willow-alder habitats (Smith 1994). Brown bears in Southeast Alaska used a wide variety of habitats throughout the year with riparian areas of salmon streams and alpine habitats important in different seasons (Schoen and Beier 1990). Most habitats in the study area will provide some value for bears, with the highest value in alpine or subalpine habitats that produce berries, and scrub habitats on mountain slopes that could support foraging and denning black bears. The lack of salmon runs in the streams within the Project Boundary prevents those riverine habitats from being high-value to bears, although bears occur regularly on the tidal flats at the mouth of Solomon Gulch outside the Project Boundary. The distribution of the important high- and moderate-value habitats that are likely to be used regularly by black bears in the study area is illustrated in Figure 5-3. Black bears are of particular interest as they are a common species and could be involved in bear-human interactions. For this habitat-generalist species, the important scrub, meadow, and forest habitats in the study area are extensive and widely distributed. Other habitat-generalist species assessed in this study are likely to exhibit a similar pattern in the distribution of important habitats.

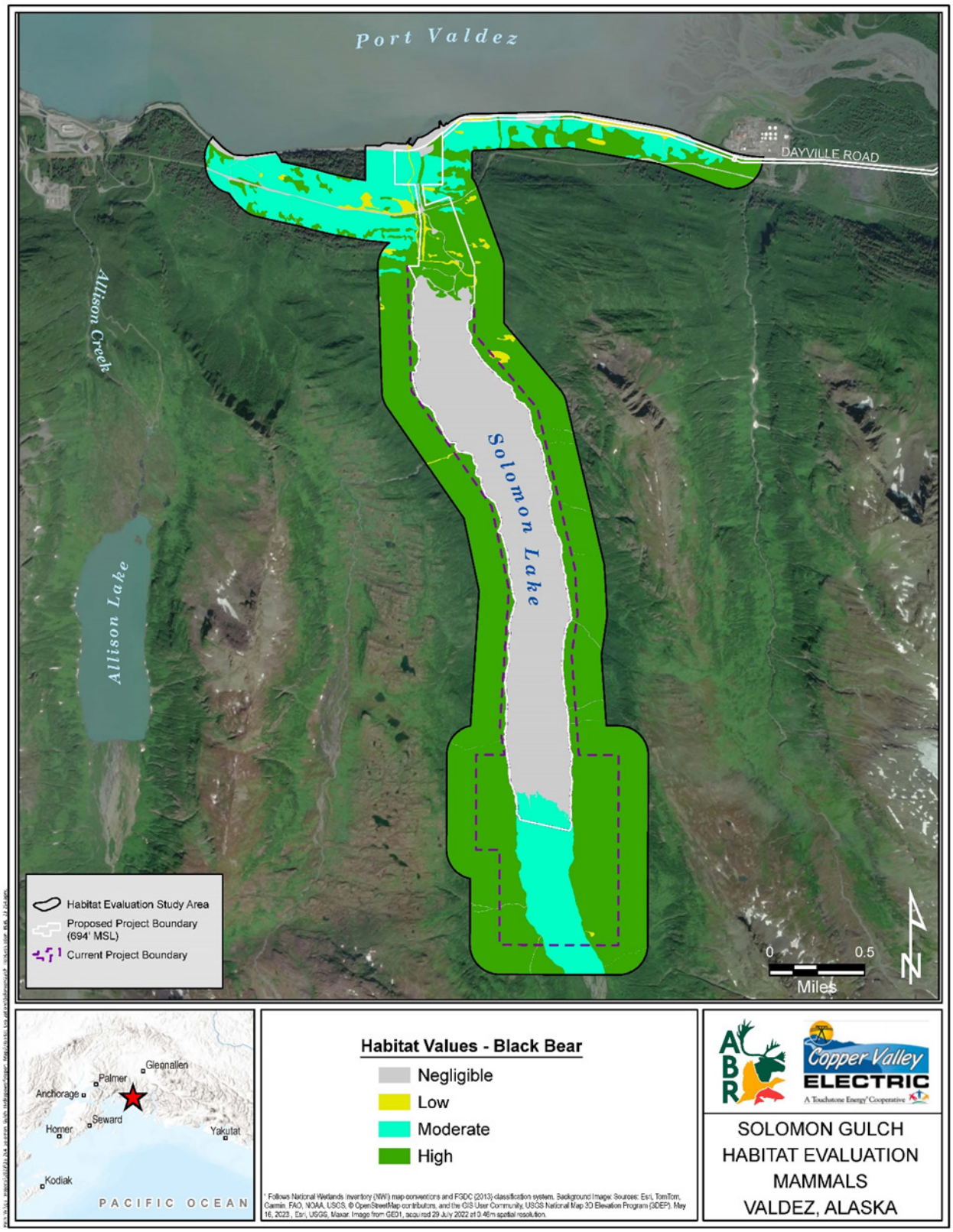

Figure 5-3 Distribution and extent of available habitats for black bears in the four habitat-value ranking categories

River otters depend on water for survival, and in Prince William Sound they are regularly found along shorelines where they frequently used old growth forests with open understories (Larsen 1983, Bowyer 1995). While otters will frequently use beach and marine habitats adjacent to the Project area, all aquatic and non-shrub riparian areas within the Project area provide some value and coastal Sitka spruce forests provide high-value for cover and denning opportunities.

Wolverines wander across large home ranges often in rugged, high-elevation terrain and typically den at higher elevations under deep snowpack (Magoun and Copeland 1998). Wolverines regularly used conifer forests during the winter in the Susitna drainage (Gardner 1985). No high-value denning habitat exists within the study area, but moderate-value habitat exists in alpine areas and Sitka spruce forest.

5.6 Discussion

Because no new alterations of the landscape and no new infrastructure is being proposed as part of the relicensing process and plan of operations for the Solomon Gulch Project, there will be no loss of existing high- or moderate-value habitats for bird and mammal species in the Project area.

6.0 STUDY VARIANCES AND MODIFICATIONS

For this study, there were no variances from the procedures described in the FSP.

7.0 STUDY SPECIFIC CONSULTATION

On November 20, 2023, CVEA filed its DSP developed for the relicensing of the Project. Stakeholders were provided 45 days to comment on the DSP. After review of the DSP by the agencies, two comments related to the Wildlife Habitat Evaluation Study were made by ADF&G and the USFWS. ADF&G requested that river otter and wolverine be included on the list as focal species of concern. The USFWS requested that Black-legged Kittiwake, Olive-sided Flycatcher, Short-billed Dowitcher, Black Oystercatcher, and little brown bat be included in the species list. These species were included in the analysis.

This Wildlife Habitat Evaluation Draft Study Report is being distributed to relicensing participants for a 60-day review period. After the review period, CVEA will update the report based on comments received, and file the final report with FERC.

8.0 SUMMARY

This was a single-year study; the study has met all objectives outlined in the FSP and is complete. No additional or future wildlife habitat evaluation studies are proposed.

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ATTACHMENT A

LITERATURE SOURCES USED FOR WILDLIFE HABITAT EVALUATION

Species	Literature Source
Rufous Hummingbird	Andres et al. 2004, Healy and Calder 2020, Jefferys et al. 2024
Belted Kingfisher	Sullivan et al. 2006, Kelly et al. 2020
Olive-sided Flycatcher	Altman and Sallabanks 2020, Norris et al. 2021
Chestnut-backed Chickadee	Haberski et al. 2016, Dahlsten et al. 2024
Tree Swallow	Winkler et al. 2020
Golden-crowned Kinglet	Andres et al. 2004, Swanson et al. 2020
Pacific Wren	Willson and Gende 2000, De Santo et al. 2003, Toews and Irwin 2020
Varied Thrush	Manuwal and Manuwal 2002, George 2020
American Pipit	MacDonald et al. 2016, Hendricks and Verbeek 2020
Redpoll	Knox and Lowther 2020, Dale 2021
Pine Siskin	Dawson 2020
Snow Bunting	Montgomerie and Lyon 2020
Fox Sparrow	Weckstein et al. 2020, Mizel and Swanson 2022
American Tree Sparrow	Naugler et al. 2020
Savannah Sparrow	Miller et al. 1994, Wheelwright and Rising 2020
Song Sparrow	Andres et al. 2005, Arcese et al. 2020
Orange-crowned Warbler	Kroll et al. 2007, Gilbert et al. 2020
Yellow Warbler	Lowther et al. 2020,
Wilson's Warbler	Benson et al. 2006, Amundson et al. 2018, Ammon and Gilbert 2020
Little Brown Bat	Loeb et al. 2014, Tessler et al. 2014, Snively et al. 2021
Black Bear	Smith 1994, Partridge et al. 2009
Brown Bear	Schoen and Beier 1990, Partridge et al. 2009, Goldstein et al. 2010
River Otter	Larsen 1983, Bowyer 1995
Wolverine	Gardner 1985, Magoun and Copeland 1998
Golden Eagle	Katzner et al. 2020
Northern Harrier	Smith et al. 2020
Bald Eagle	Anthony et al. 1982, Buehler 2022
Red-tailed Hawk	Preston and Beane 2020
Boreal Owl	Domahid et al. 2019, Hayward and Hayward 2020
Marbled Murrelet	Nelson 2020
Kittlitz's Murrelet	Day et al. 2020

Species	Literature Source
Black-legged Kittiwake	Hatch et al. 2020
Red-throated Loon	Rizzolo et al. 2020
Black Oystercatcher	Andres and Falxa 2020
Short-billed Dowitcher	Jehl Jr. et al. 2020
Lesser Yellowlegs	Tibbitts and Moskoff 2020

APPENDIX F

RECREATION EVALUATION DRAFT STUDY REPORT

RECREATION EVALUATION DRAFT STUDY REPORT

SOLOMON GULCH HYDROELECTRIC PROJECT
FERC NO. 2742

Submitted by:

Copper Valley Electric Association
Valdez, Alaska

Prepared by:

Kleinschmidt Associaties

January 2025

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DEFINITIONS OF TERMS, ACRONYMS, AND ABBREVIATIONS

A	
ADA	Americans with Disabilities Act
ADNR	Alaska Department of Natural Resources
ADPOR	Alaska Division of Parks and Outdoor Recreation
C	
CVEA	Copper Valley Electric Association
D	
DSP	Draft Study Plan
F	
FERC	Federal Energy Regulatory Commission
FSP	Final Study Plan
G	
GIS	Geographic Information Systems
P	
PAD	Pre-Application Document
Project	Solomon Gulch Hydroelectric Project
Q	
QR	Quick Response
R	
ROW	Right of way
S	
SCORP	Statewide Comprehensive Outdoor Recreation Plan
T	
TAPS	Trans Alaska Pipeline System

1.0 INTRODUCTION

Copper Valley Electric Association, Inc. (CVEA or Licensee) is the Licensee, owner, and operator of the existing 12-megawatt Solomon Gulch Hydroelectric Project, Federal Energy Regulatory Commission (FERC) Project No. 2742 (Project). The Solomon Gulch Project is a major project located on Solomon Lake near Valdez, Alaska. The original license was issued on June 21, 1978, for a term of 50 years, and expires on May 31, 2028. CVEA is pursuing a new license for the Project using the FERC Traditional Licensing Process. CVEA submitted a Pre-Application Document (PAD) and Notice of Intent on April 28, 2023.[1] A detailed description of the Solomon Gulch Project is provided in the PAD.

On November 20, 2023, CVEA filed a Draft Study Plan (DSP) with FERC[2] and distributed it to stakeholders. The DSP outlined seven studies proposed to take place in summer 2024 as part of the relicensing process. CVEA filed the Final Study Plan (FSP) with FERC on April 10, 2024 (CVEA 2024).[3]

This report describes the results of the Recreation Evaluation Study, which was conducted following methods described in the FSP.

[1] FERC Accession Number 20230428-5508.
[2] FERC Accession Number 20231120-5091.
[3] FERC Accession Number 20240410-5151.

2.0 STUDY AREA

The study area for the Recreation Evaluation Study includes one FERC approved recreation site, the John Hunter Memorial Trail located within the Solomon Gulch Project Boundary (Figure 2-1).

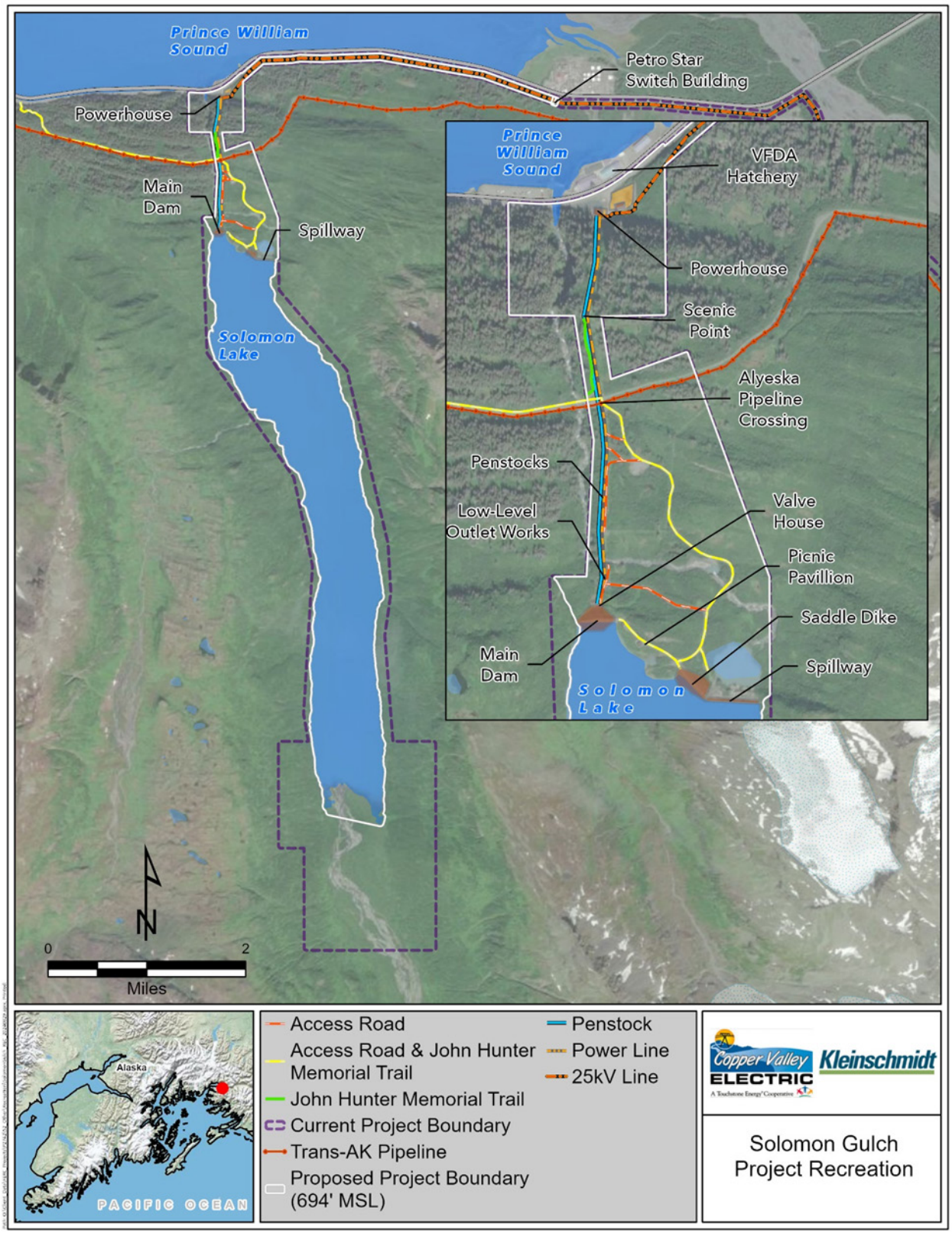

Figure 2-1 Project Recreation Area

3.0 GOALS AND OBJECTIVES

The goals and objectives of the Recreation Evaluation Study were to:

Goal 1 – Gather baseline information on the John Hunter Memorial rail

- Objective 1.1: Review existing information, inventory, and map (using geographic information systems [GIS]) the existing John Hunter Memorial Trail within the Solomon Gulch Project Boundary, including site location and facilities/amenities.
- Objective 1.2: Evaluate the condition of the John Hunter Memorial Trail and facilities/amenities within the Solomon Gulch Project Boundary, including existing information on the suitability of facilities/amenities to provide opportunities for persons with disabilities to participate in recreation opportunities (i.e., compliance with current Americans with Disabilities Act [ADA] design standards), where feasible, and public safety features.

Goal 2 – Characterize the existing recreation use of the John Hunter Memorial Trail

- Objective 2.1: Estimate the recreation use of the John Hunter Memorial Trail by day type (i.e., weekday, weekend, or peak weekend/holiday) and activity.
- Objective 2.2: Evaluate visitor feedback regarding the perception and experience of the John Hunter Memorial Trail.

Goal 3 – Identify current and future recreation needs related to the John Hunter Memorial Trail

- Objective 3.1: Evaluate whether recreation capacity and the existing facilities/amenities on the John Hunter Memorial Trail meet current needs.
- Objective 3.2: Estimate future recreation use of the John Hunter Memorial Trail.
- Objective 3.3: Estimate potential future recreation needs and the ability of the John Hunter Memorial Trail to meet future needs over the term of a new license.

Table 3-1 summarizes the study objectives, information needed to meet those objectives, and sources of information. Section 4.0, Study Scope and Methodology, details the data collection methods.

Table 3-1 Recreation Evaluation Study Plan Objectives and Efforts

Objectives	Information Needed	Source(s)
Goal 1: Gather baseline information on the John Hunter Memorial Trail		
Objective 1.1: Review existing information, inventory, and map (using GIS) the existing John Hunter Memorial Trail within the Solomon Gulch Project Boundary, including site location and facilities/amenities.	• Recreation site locations • Project Boundary	• Existing data • On-site data collection
Objective 1.2: Evaluate the condition of the John Hunter Memorial Trail and facilities/amenities within the Solomon Gulch Project Boundary, including existing information on the suitability of facilities to provide opportunities for persons with disabilities to participate in recreation opportunities (i.e., compliance with current ADA design standards), where feasible, and public safety features.	• Site amenities available • Site conditions • ADA design standards • Public safety features	• On-site data collection
Goal 2: Characterize the existing recreation use of the John Hunter Memorial Trail		
Objective 2.1: Estimate the recreation use of the John Hunter Memorial Trail by day type (i.e., weekday, weekend, or peak weekend/holiday) and activity.	• Estimate the number of vehicles per day • Estimate the number of trail users per day • Estimate length of stay • Estimate number of people/vehicles • Proportion of visitors engaged in each available activity	• Existing data • Recreation use survey

Objectives	Information Needed	Source(s)
Objective 2.2: Evaluate visitor feedback regarding the perception and experience of the John Hunter Memorial Trail.	• Percent of visitors perceiving crowded facilities • Percent of visitors satisfied with recreational facilities • Average quality rating of facilities and amenities • Average value rating of overall recreation site	• Recreation use survey
Goal 3: Identify current and future recreation needs related to the John Hunter Memorial Trail		
Objective 3.1: Evaluate whether recreation capacity and the existing facilities and amenities on the John Hunter Memorial Trail meet current needs.	• User perceptions of crowding and needed facility/improvements compared to existing data	• Recreation site inventory • Results of Goal 2 analysis • Existing data
Objective 3.2: Estimate future recreation use of the John Hunter Memorial Trail.	• Current recreational use assessment • Population projects for the Project area • Recreational use trends	• Results of Goal 2 analysis • U.S. Bureau of Census data • SCORP or other readily available literature • Existing data
Objective 3.3: Estimate potential future recreation needs and the ability of the John Hunter Memorial Trail to meet future needs over the term of a new license.	• Recreation inventory • Condition assessment • Parking capacity at recreation site versus projected needs density • Future needs identified by additional sources	• Recreation site inventory and condition assessment • Results of Goal 2 analysis

4.0 STUDY SCOPE AND METHODOLOGY

4.1 Project Recreation Site Inventory and Condition Assessment

CVEA compiled a site inventory and condition assessment for the John Hunter Memorial Trail. The recreation site inventory and condition assessment:

- mapped the location of the recreation site in relation to the Project Boundary;
- described the type, number, and condition of amenities at the site;
- estimated parking capacity;
- evaluated the condition of the recreation site and facilities, including suitability of facilities to provide opportunities for persons with disabilities to participate in recreation opportunities (i.e., compliance with current ADA design standards) and public safety features; and
- documented recreation facilities using photographs.

A Recreation Site Inventory Form (Attachment A) was completed for the John Hunter Memorial Trail. The inventory documented the type, number, and size of facilities and amenities (parking areas, picnic shelters, tables, etc.) located at/along the John Hunter Memorial Trail. The general condition of all facilities was noted during the inventory, and any facilities that qualify as ADA or barrier-free were identified as such.

In addition, detailed maps of the John Hunter Memorial Trail were developed that identify parcel boundaries, current property owner(s), access locations, spur trails, and facilities/amenities.

4.2 Project Recreation Use and Future Recreation Demand

4.2.1 Recreation User Surveys

Recreation user surveys were collected for the John Hunter Memorial Trail. A Quick Response (QR) code was posted at the sign-in station located where the trail connects to the Trans Alaska Pipeline System (TAPS) right-of-way (ROW) (Attachment B). Additionally, CVEA posted a link to the recreation user survey on the CVEA website. The survey included questions regarding user demographics, group size, length of stay, type of recreation activities participated in, and perceptions of crowdedness and condition of recreation facilities.

A sample recreation user survey form is included in Attachment C. The data collected were used to identify recreation use patterns and use estimates at/along the John Hunter Memorial Trail. The data on user perceptions of crowdedness were also used to determine future expansion needs at/along the John Hunter Memorial Trail.

4.2.2 Current Recreation Use

For the John Hunter Memorial Trail, recreation days[4] were estimated based on data collected from the recreation user surveys using the following recreation day calculation (Pollock et al. 1994):

Average Vehicle Count
x Average People per Vehicle (from recreation user surveys)
x Recreation Day Length (assumed 12 hours for a day use site)
x Total Number of Days (by day type [i.e., weekday, weekend, holiday])
÷ Average Trip Length (in hours from recreation user surveys)
= Estimated Number of Recreation Days (by day type)

The estimates are presented as total recreation days, by day type, for the John Hunter Memorial Trail. The day types used in this study were weekdays (Monday through Friday), weekends (Saturday and Sunday), and holidays. For the purposes of this study, the holidays were considered to be Juneteenth (June 19, 2024), July 4th weekend (July 4-7, 2024), and Labor Day weekend (August 31 to September 2, 2024). For the recreation day estimates, it was assumed that each group used one vehicle to arrive at the site; thus, the average vehicle count was one. It was also assumed that the individuals included in each group arrived in one vehicle; thus, the average people per vehicle was the same as the group size. The average group size (Question 3) and average trip length (Question 6) were estimated from the responses to the user survey.

4.3 Future Recreation Use and Needs

Future annual visitation to the John Hunter Memorial Trail was estimated based on review of existing population forecasts in the Chugach Census Area in Alaska. The population forecasts were applied to the annual recreation day estimates for the Project to determine a future recreation use estimate. CVEA also reviewed the Alaska State Comprehensive

[4] As defined by FERC, a recreation day is each visit by a person to the study site for recreational purposes during any portion of a 24-hour period.

Outdoor Recreation Plan (SCORP) during the future recreation use analysis. This information was considered when determining future recreation needs at the Project.

The need for recreation and site development or modifications of the John Hunter Memorial Trail was assessed based on the inventory, condition assessment results, user survey results, and future recreation use estimates. The needs assessment focused on the existing condition and user opinions of the John Hunter Memorial Trail, the presence of barrier free or ADA facilities at/along the John Hunter Memorial Trail, and the ability of the John Hunter Memorial Trail to meet current and anticipated future recreation demand.

5.0 STUDY RESULTS AND DISCUSSION

5.1 Project Recreation Site Inventory and Condition Assessment

The only recreation site within the Project Boundary is the FERC-approved recreation site, the John Hunter Memorial Trail. The John Hunter Memorial Trail is located to the south of Prince William Sound (Figure 5-1). The site includes a hiking trail that extends from the trailhead off of Dayville Road to Solomon Lake. The trail doubles as an access road for CVEA operators. At Bailey Bridge, there is a fork in the trail. The portion of the trail that leads north brings visitors to an overlook of Prince William Sound and the town of Valdez (Photo 5-1). The portion of the trail that leads south brings visitors to Solomon Lake. The site is managed by CVEA, is unstaffed, and is open year-round, 24 hours per day.

A sign detailing the area is located on the left side of the trailhead entrance (Photo 5-2). Users of the site have the option of parking at either the trailhead parking area, which can accommodate approximately 8 vehicles, or at an informal area, which can accommodate approximately 4 vehicles at a gate about 0.25 miles up the trail at which point only CVEA staff have vehicle access.

Facilities and amenities available at the site include informational signage (Photo 5-3, Photo 5-4, Photo 5-5), directional signage (Photo 5-6), a picnic shelter, a picnic table, and a trash receptacle (Photo 5-7 and Photo 5-8). There are points along the trail to view Solomon Creek, one located at Bailey Bridge (Photo 5-9) and another further upstream (Photo 5-10). Once at the termination of the trail, visitors have a view of Solomon Lake (Photo 5-11).

All facilities and amenities at the site including signage, picnic shelter, picnic table, and trash receptacle were noted to be in good condition. The access road was noted to be in need of minor repairs and/or maintenance. Due to the natural and steep terrain, the trail is not ADA accessible. Additionally, and for the same reason, the facilities and amenities along the trail and at the termination of the trail are not ADA accessible.

Safety signage is posted on Bailey Bridge noting the bridge load capacity for CVEA staff. Additionally, the safety signage warns visitors not to climb on the side of the bridge. Visitors noted on the user survey that no bear safety signs were located along the trail.

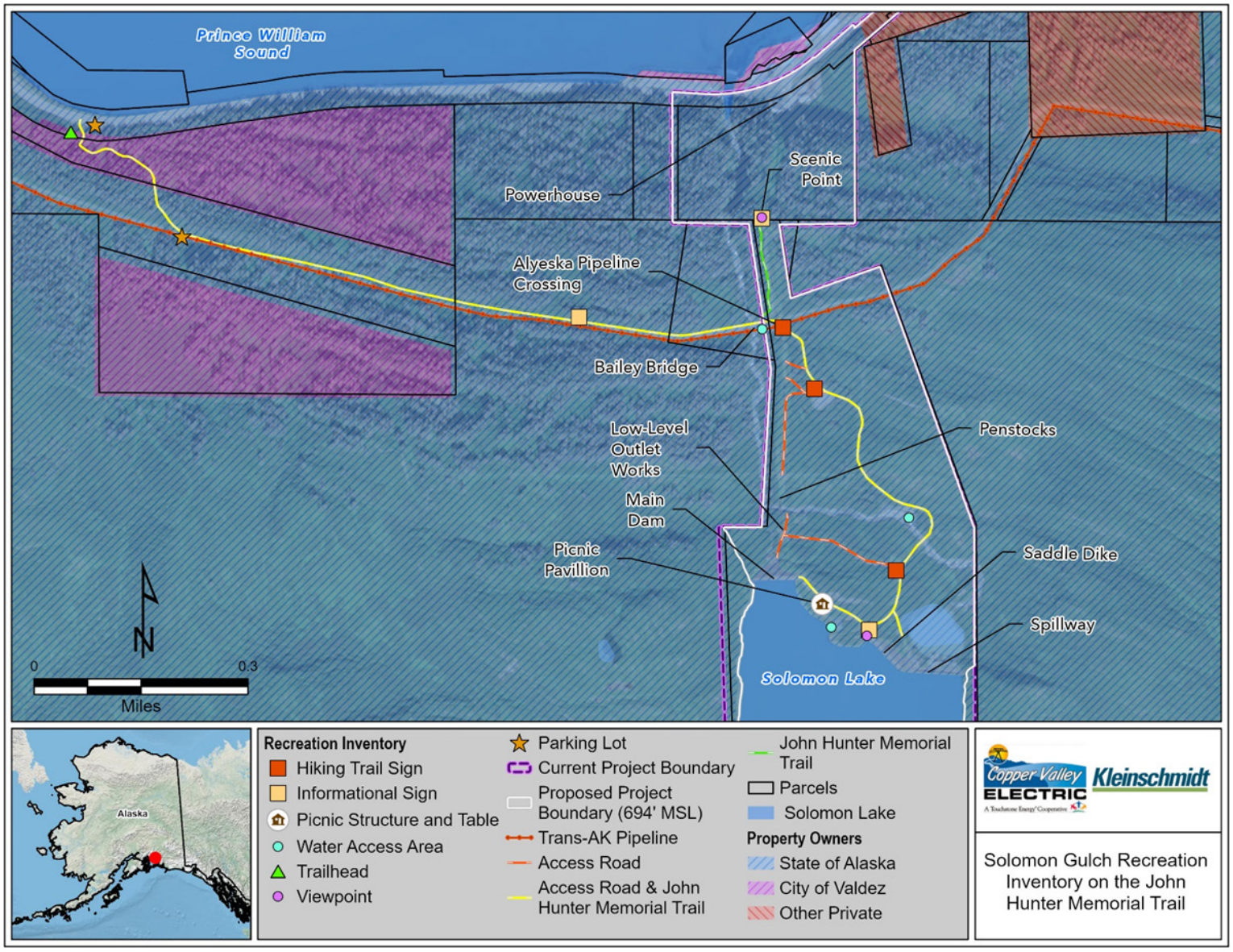

Figure 5-1 Recreation Inventory of John Hunter Memorial Trail

Photo 5-1 Overlook of Prince William Sound

Photo 5-2 Trailhead of John Hunter Memorial Trail

Photo 5-3 Informational Signage Along Trail

Photo 5-4 Informational Signage at Overlook of Prince William Sound

Photo 5-5 Informational Signage at the end of the John Hunter Memorial Trail at Solomon Lake

Photo 5-6 Directional Sign Along Trail

Photo 5-7 Picnic Area at the end of the John Hunter Memorial Trail

Photo 5-8 Picnic Table and Trash Receptacle at Picnic Area

Photo 5-9 Downstream View of Solomon Creek

Photo 5-10 Upstream View of Solomon Creek

Photo 5-11 View of Solomon Lake from Trail

5.2 Project Recreation Use

5.2.1 Recreation User Surveys

The recreation user surveys provide a variety of information on visitors including demographics, user experience, historical recreation use, and user perceptions. Between June 2, 2024, and September 2, 2024, 57 surveys were submitted via the QR code posted at the sign-in station located where the John Hunter Memorial Trail connects to the TAPS ROW (Photo 5-12) and the CVEA website. Of the 57 surveys received, five were submitted by someone who had previously completed the survey; therefore, 52 unique surveys were analyzed for this report.

Photo 5-12 Recreation User Survey QR Code Flyer Location

5.2.1.1 Visitor Demographics

Most visitors to the John Hunter Memorial trail originated from Alaska (57.7 percent) with others coming from California (9.6 percent), Arizona (3.8 percent), South Dakota (3.8 percent), and Virginia (3.8 percent). The remaining respondents consisted of international visitors (5.8 percent) and visitors from other parts of the United States (15.5 percent).

When asked to indicate their ethnicity, 77 percent of visitors reported being White, while 6 percent of visitors reported being Native Hawaiian and other Pacific Islander. The remaining visitors reported ethnicity of American Indian and Alaska Native, Hispanic or Latino, or other (Figure 5-2). Seven percent declined to report their ethnicity.

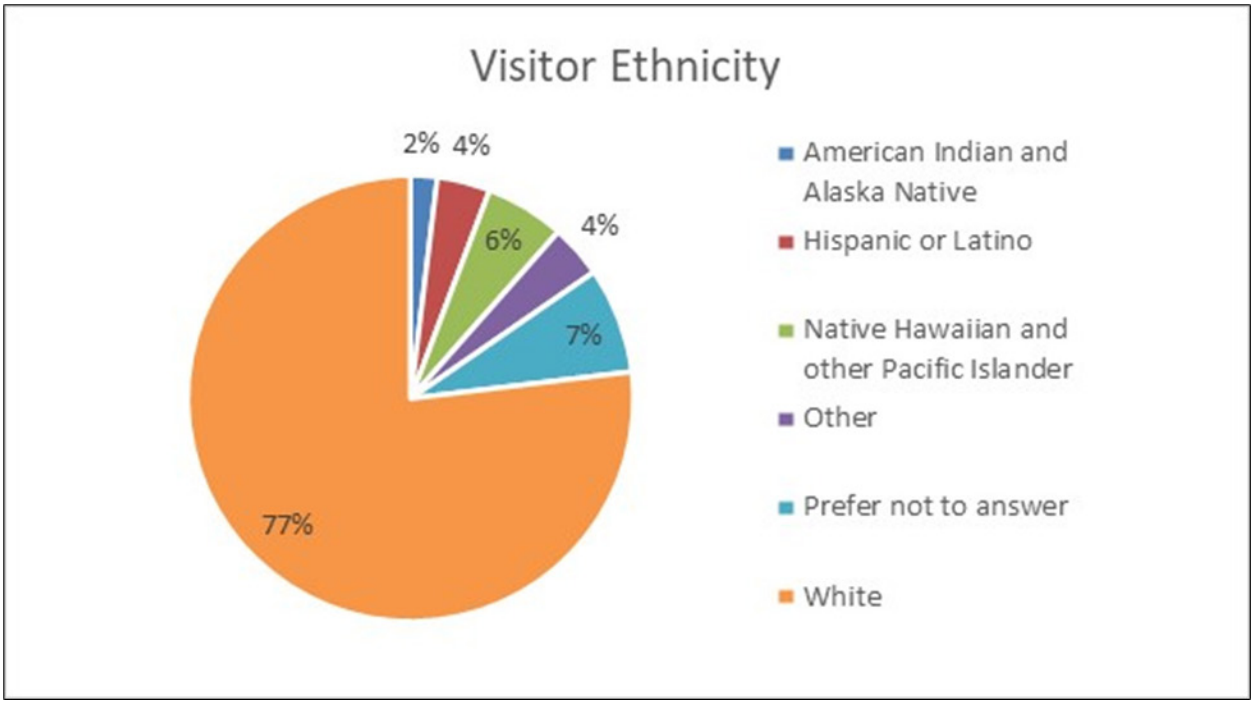

Figure 5-2 Visitor Ethnicity

The overall average group size at the John Hunter Memorial Trail was 2.9 people with a median of 2 people and a maximum group size of 15 people (Table 5-1).

Table 5-1 Group Size

Response Count	Group Size				Total People
	Minimum	Average	Median	Maximum	
52	1	2.9	2	15	153

5.2.1.2 Current Trip Information and Experience

Table 5-2 shows the type of day visitors arrived at the John Hunter Memorial Trail. Approximately 73 percent of visitors arrived on a weekday followed by weekends and holidays each with 13 percent.

Table 5-2 Date of Arrival by Type of Day

Type of Day	Total Responses	
	Count	Percent
Holiday	7	13
Weekday	38	73
Weekend	7	13

To estimate the length of time visitors recreated at the John Hunter Memorial Trail, visitors were asked to provide the number of hours they had spent at the site on their current trip. The average time spent at the John Hunter Memorial Trail was 2.6 hours with a median of 2 hours and a maximum of 5 hours (Table 5-3).

Table 5-3 Statistical Summary of Length of Stay (Hours)

Length of Stay (Hours)	
# Responses	51[a]
Minimum Hours	1
Average Hours	2.6
Median Hours	2
Maximum Hours	5

[a] One survey respondent noted their length of stay was 25 hours. Given a day is only 24 hours in length, this entry was deemed to be anomalous and was removed from analysis for this question.

Visitors were asked to indicate the primary recreation activity they were participating in on their current trip. As shown in Table 5-4, the most popular activity participated in was walking (42 percent), followed by scenery/scenic viewing (29 percent), and then nature observation (8 percent).

Visitors were also asked to indicate any secondary recreation activities they participated in during their visit. Visitors were able to select as many activities as applied. The top three secondary activities were sightseeing (58 percent), scenery/scenic viewing (54 percent), and walking (50 percent) (Table 5-4).

Table 5-4 Primary and Secondary Recreation Activities

Activity	Primary Activity		Secondary Activity	
	Count	%	Count	%
Birding	0	0	9	17
Dog Walking	2	4	12	23
Nature Observation	4	8	24	46
Photography	0	0	24	46
Picnicking	0	0	8	15
Running	2	4	2	4
Scenery/Scenic Viewing	15	29	28	54
Sightseeing	2	4	30	58
Walking	22	42	26	50
Other [a, b]	5	10	5	10
None	0	0	4	8
Total Responses	52	100	52	-

[a] Other primary activities include biking, swimming, skiing, snowshoeing, hiking, and fishing.
[b] Other secondary activities include kayaking, packrafting, and swimming.

5.2.1.3 Past Recreation Trips

Visitors were asked to identify which activities they had participated in over the last year at this site by season. In the spring and summer, the most common activities reported were walking, scenery/scenic viewing, nature observation, and sightseeing. During the fall, the most common activities participated in were walking, scenery/scenic viewing, nature observation, and photography. In the winter, the most common activities were walking, nature observation, and a variety of winter activities (skiing, snowmobiling, snowshoeing, and alpine touring) (Table 5-5).

Table 5-5 Activities Participated in Within the Past Year

Activity	Spring (Apr 1–May 31) (count)	Summer (Jun 1–Aug 31) (count)	Fall (Sept 1–Oct 31) (count)	Winter (Nov 1–Mar 31) (count)
Birding	4	6	5	3
Dog Walking	2	7	3	1
Nature Observation	10	16	8	6
Photography	6	11	8	5
Picnicking	4	7	6	4
Running	3	6	4	0
Scenery/Scenic Viewing	11	26	10	5
Sightseeing	10	18	7	5
Walking	15	26	12	7
Other[a]	7	7	6	11
Total Responses	72	130	69	47

[a] Spring Other: skiing, snowmobiling, snowshoeing, snow machine
Summer Other: biking, camping, fishing, kayaking, mountaineering, swimming, canoeing
Fall Other: fishing, ice skating, hunting, mountaineering
Winter Other: skiing, snowmobiling, snowshoeing, snow machining, alpine touring

5.2.1.4 User Perception and Feedback

Of the 52 visitor surveys collected, approximately 90 percent of respondents indicated the recreation site was not crowded or slightly crowded (Figure 5-3). Six percent of the visitors noted the site as being somewhat crowded and 4 percent of visitors felt the site was moderately crowded. No visitors thought the site was extremely crowded.

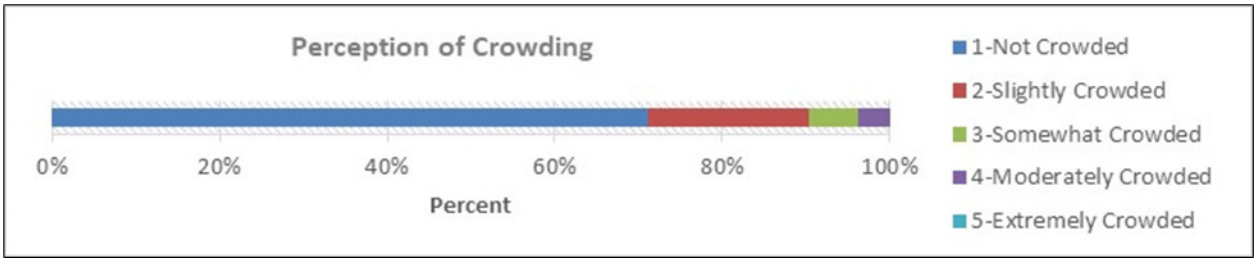

Figure 5-3 Perception of Crowding

Visitors were asked if their visit was affected by traffic, weather, other users, or site conditions. A majority of the visitors (85 percent) noted that none of these options affected their visit. Twelve percent of visitors noted that weather affected their trip (Table 5-6).

Table 5-6 Variables Affecting Current Visit

Response	Count	Percent
None	44	85
Other Users	1	2
Site Conditions	1	2
Weather	6	12

Visitors were asked to rate their satisfaction with the available recreation facilities at the John Hunter Memorial Trail. More than 70 percent of visitors were either extremely satisfied or more than satisfied with the recreation facilities available (Figure 5-4). Approximately 2 percent of visitors were slightly satisfied and noted the reason to be that there was still snow on the trail during their visit.

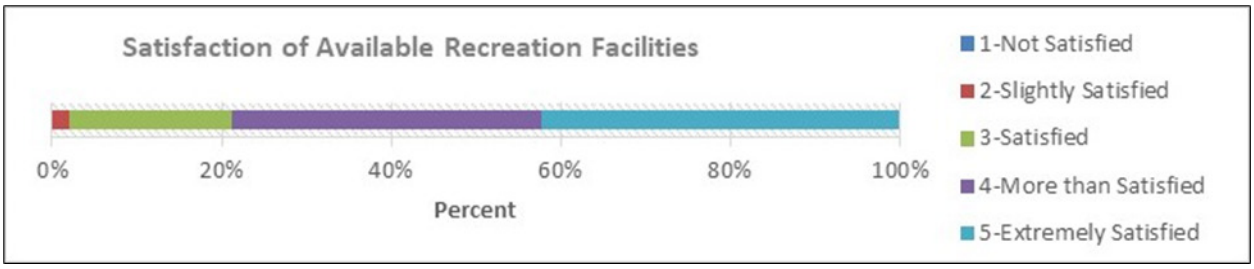

Figure 5-4 Satisfaction of Available Recreation Facilities

Visitors were asked to rate the quality and condition of the parking, safety signage, and the overall site condition for the John Hunter Memorial Trail. Visitors were asked to rate the quality and condition of the facilities on a scale from 1 to 5 with 1 indicating poor and 5 indicating excellent. Overall, visitors rated the parking as fair to excellent (96 percent) with an average rating of 4.3. Four percent of visitors noted that the parking was in between poor and fair condition, indicating that there was not enough parking for the number of vehicles present, and they were not sure where they could park for free noting better signage is needed (Figure 5-5). Visitors rated the safety signage as fair to excellent (98 percent) with an average rating of 4.2. Two percent of visitors noted that the safety signage was in poor condition, indicating that no bear safety signs and no signs to the lookout were provided. Additionally, they noted it was hard to decide which road/trail led to a given location (Figure 5-6). All survey respondents rated the overall site condition for the John Hunter Memorial Trail as fair (10 percent), between fair and excellent (36 percent), or excellent (54 percent) (Figure 5-7). The average rating for site condition was 4.4.

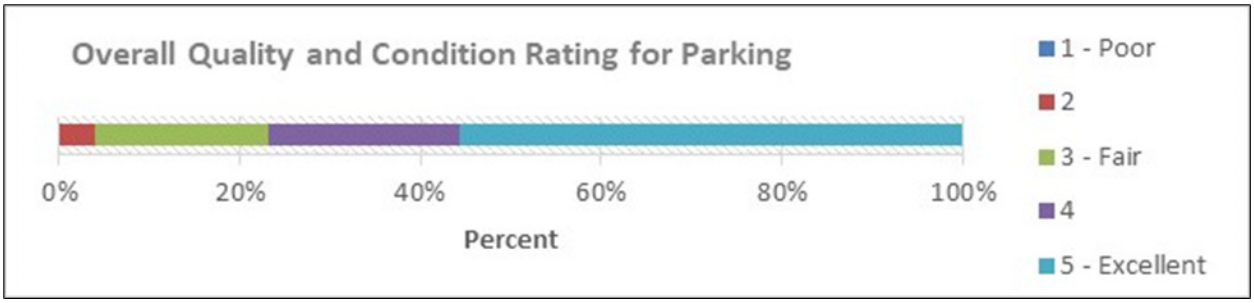

Figure 5-5 Rating of the Quality and Condition of the Parking Area

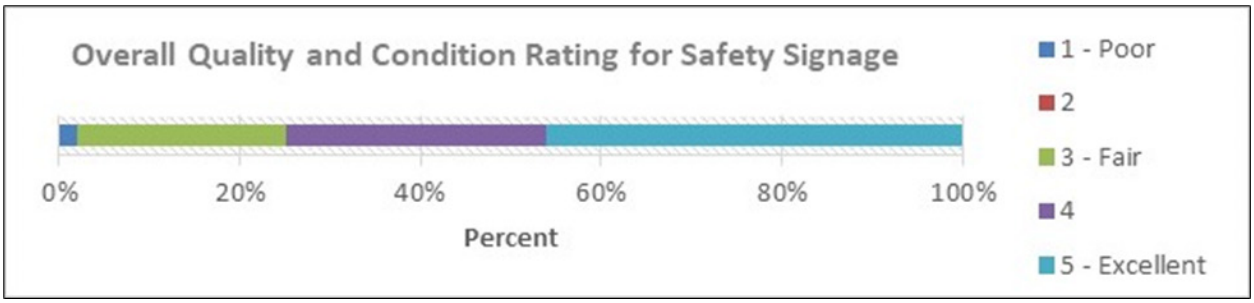

Figure 5-6 Rating of the Quality and Condition of Safety Signage

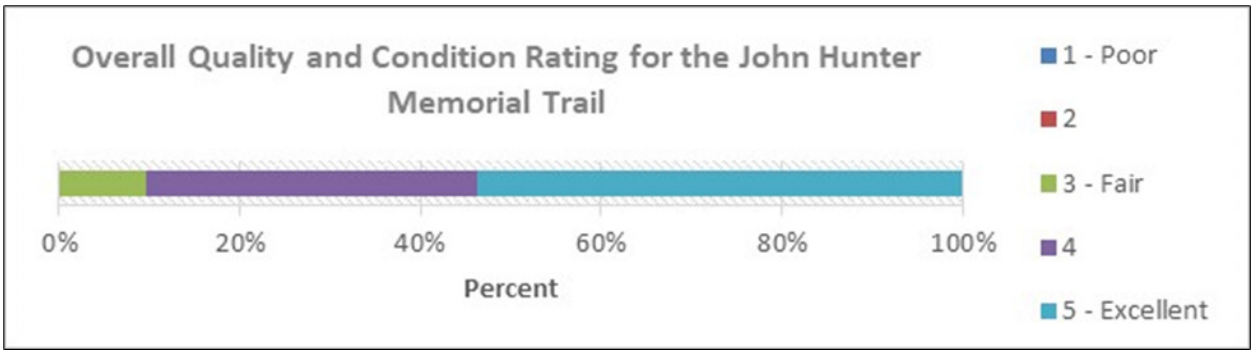

Figure 5-7 Rating of the Quality and Condition of the Overall Site

Visitors were asked to rate the value of the John Hunter Memorial Trail as a public recreation resource. The responses indicated that 67 percent of visitors placed a high value on this site as a public recreation resource (Figure 5-8).

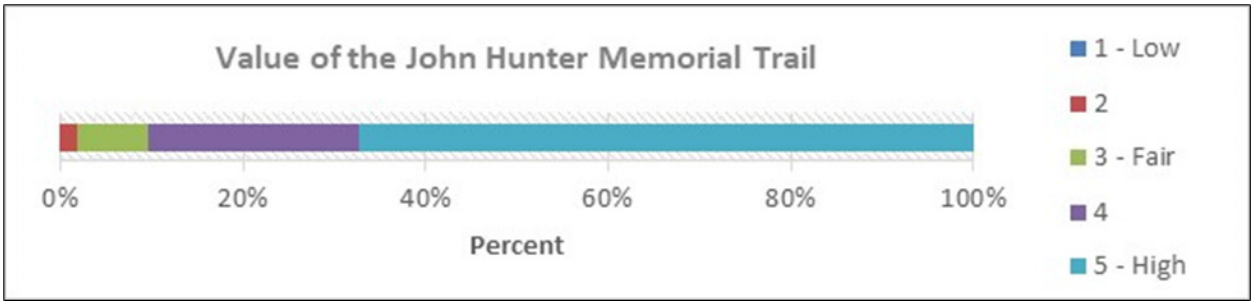

Figure 5-8 Rating of the Value of the Site as a Recreation Opportunity

When asked if they would return to the John Hunter Memorial Trail over the course of the next year, 87 percent of visitors indicated that they would return (Table 5-7).

Table 5-7 Responses of Visitors Planning to Return Over the Next Year

Response	Count	Percent
Yes	45	87
No	7	13

5.2.2 Recreation Use

Based on the reported group sizes from the recreation user survey, 153 recreationists reported partaking in recreation activities at the John Hunter Memorial Trail. Visitors reported walking, scenery/scenic viewing, and sightseeing as the most common activities.

The estimated recreation days, by day type (weekday, weekend, holiday), between June 2, 2024, and September 2, 2024, are provided in Table 5-8. The estimated total recreation days for the John Hunter Memorial Trail was 1,220 days. The most recreation days, by day type, were recorded on weekdays with 879 days, followed by weekends with 237 days, and holidays with 104 days.

Table 5-8 Estimated Recreation Visitation (Recreation Days) from June 2, 2024, to September 2, 2024

Day Type	John Hunter Memorial Trail Recreation Days
Total Weekday	879
Total Weekend	237
Total Holiday	104
Total	1,220

5.3 Future Recreation Use and Needs Estimates

The estimated projections of future recreation use were developed using the average annual change in population over the past 10 years, as reported by the U.S. Census Bureau (Table 5-9). In 2019, the Valdez-Cordova Census Area was divided into two census areas, Chugach Census Area and Copper River Census Area. To develop a representative dataset for 10 years, CVEA used the Valdez-Cordova Census Area data from 2013-2019 and the combined data from Chugach Census Area and Copper River Census Area for 2020-2022. Based on the 10-year historical data, the average annual change in population was -0.1 percent.

Table 5-9 Population Change from 2013 to 2022

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	10-year Average
Census Data	9,682	9,685	9,617	9,522	9,439	9,301	9,243	9,389	9,650	9,614	
Percent Change		0.0	-0.7	-1.0	-0.9	-1.5	-0.6	1.6	2.8	-0.4	-0.1

Source: U.S. Census 2020, 2021, and 2022

Based on the 10-year average rate of change in population, the estimated population projections are provided in 10-year intervals for the anticipated term of the license up to 40 years into the future (Table 5-10).

Table 5-10 Population Projections through 2070 for the Chugach Census Area

	2020 Census	2030 Projection	2040 Projection	2050 Projection	2060 Projection	2070 Projection
Chugach Census Area	9,389	9,296	9,203	9,112	9,021	8,931

Per generally accepted practice and the methods described in the study plan, estimates of future recreation use at the John Hunter Memorial Trail were determined by projecting the 2024 recreation day estimates (Table 5-11) in 10-year intervals to 2070. The current recreation use is estimated to be approximately 1,220 recreation days in 2024 for the John Hunter Memorial Trail. FERC may issue a new license for the Project for a term of 40 years, at which time the John Hunter Memorial Trail could receive approximately 1,160 annual recreation days by 2070. This represents a decrease of approximately 60 recreation days.

Table 5-11 Estimated Future Recreation Days 2024-2070

	2024	2030	2040	2050	2060	2070
Future Estimated Recreation Days	1,220	1,208	1,196	1,184	1,172	1,160

Future recreation needs at the John Hunter Memorial trail can be assessed in part by comparing the recreation use estimates and user perception feedback received on the recreation user surveys. Assuming recreation use would change at the same rate as population, recreation days at the John Hunter Memorial Trail could decrease by approximately 60 recreation days by 2070. Parking availability was identified as a concern at the John Hunter Memorial Trail by two respondents during the study period. Increased parking and better signage for parking were provided as comments in the recreation user survey.

Considering the surrounding area, the Alaska SCORP notes that the Southcentral Alaska region includes a large majority of Alaska's population, has the most visited destinations, and has a well-developed outdoor recreation infrastructure (ADNR 2023). Based on the public survey results published in the Alaska SCORP, southcentral respondents noted that more trail head parking areas with signage and restrooms; long, interconnected, summer trail systems linking communities; and trails accessible to persons with disabilities were needed (ADNR 2023). Based on the feedback presented from the public survey in the

SCORP, future recreation projections and the continuation of the John Hunter Memorial Trail for public use would be in alignment with the needs of the public.

6.0 STUDY VARIANCES AND MODIFICATIONS

For this study, there were no variances from the procedures described in the FSP.

7.0 STUDY SPECIFIC CONSULTATION

On November 20, 2023, CVEA filed its DSP developed for the relicensing of the Project. Stakeholders were provided 45 days to comment on the DSP. Following the comment period, CVEA filed the FSP with FERC on April 10, 2024. No comments were provided for this Recreation Evaluation Study.

This Recreation Evaluation Draft Study Report is being distributed to relicensing participants for a 60-day review period. After the review period, CVEA will update the report based on comments received, and file the final report with FERC.

8.0 SUMMARY

The Recreation Evaluation Study was a single-year study. The goals and objectives outlined in the FSP have been met. Specifically, this study provides an assessment of the Project recreation site, visitor use, recreation opportunities in the Project Boundary, and needs of additional recreation resources. No additional or future recreation studies are proposed.

9.0 REFERENCES

Alaska Department of Natural Resources (ADNR), Division of Parks and Outdoor Recreation (ADPOR), 2023. Alaska's Statewide Comprehensive Outdoor Recreation Plan 2023-2027, Alaska Life Outdoors. Accessible at: https://dnr.alaska.gov/parks/plans/scorp/2023/23-27akscorpfull.pdf. Accessed on October 8, 2024.

Copper Valley Electric Association, Inc (CVEA). 2024. Final Study Plan, Solomon Gulch Hydroelectric Project, FERC No. 2742. Prepared by Kleinschmidt. 64pp + attachments.

Pollack, K.H., C.M. Jones, and T.L. Brown. 1994. Angler Survey Methods and Their Applications in Fisheries Management. American Fisheries Society Special Publication 25. American Fisheries Society, Bethesda, MD.

U.S. Census Bureau (U.S. Census). 2020. "Total Population." American Community Survey, ACS 5-Year Estimates Detailed Tables, Table B01003, 2020, https://data.census.gov/table/ACSDT5Y2020.B01003?q=B01003&g=050XX00US02063. Accessed on September 10, 2024.

_____. 2021. "Total Population." American Community Survey, ACS 5-Year Estimates Detailed Tables, Table B01003, 2021, https://data.census.gov/table/ACSDT5Y2021.B01003?q=B01003&g=050XX00US02063. Accessed on September 10, 2024.

_____. 2022. "Total Population." American Community Survey, ACS 5-Year Estimates Detailed Tables, Table B01003, 2022, https://data.census.gov/table/ACSDT5Y2022.B01003?q=B01003&g=050XX00US02063. Accessed on September 10, 2024.

ATTACHMENT A

RECREATION SITE INVENTORY FORM

SOLOMON GULCH PROJECT
RECREATION SITE INVENTORY FORM

Observed by: Emma Royce Date/Time: 20240627 1230

Site Name: John Hunter Memorial Trail GPS Coordinates: N 61.08248° W146.33348°

Facility Type:

- ☐ Day Use Area
- ☒ Picnic Area
- ☒ Trailhead
- ☐ Informal Site

Road Access: Condition Description (N-replace, R-repair, M-maintain, G-good)
: R

- ☒ Paved access # lanes 2
- ☒ Unpaved access # lanes 1

Parking Lots: Condition Description (N-replace, R-repair, M-maintain, G-good):

Type	# Paved	# Estimated Gravel	Space Delineation
Universal Access Spaces	____	lower perking ____	☐ Painted ☐ Curbs ☐ Signage
Regular Spaces	____	8 4 upper perking	☐ Painted ☐ Curbs ☒ Signage
Vehicle & Trailer Spaces	____	____	☐ Painted ☐ Curbs ☐ Signage

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Operations:

- ☐ Staffed ☒ Unstaffed
- ☐ Fee: (Site $____; Parking $____)
- ☐ Seasonal (From _____ To _____)
- ☒ Year Round

Operating Hours _____
Project Facility: _____

Owner/Manager Alyeska / CVEA
Within FERC Project boundary? Y

Day Use Site Amenities (total # of all amenities per site; provide additional specifications on next page):

#	Type	Condition (N-replace, R-repair, M-maintain, G-good)	Universal Access
1	Picnic Shelter	G	
	Overlook		
1	Picnic Tables	G	
	Bear Box		
	Pedestrian Trail		
1	Trash Receptacles	G	
	Grills		
	Fishing Pier/Platform		
	Firepit/ring		
	Fishing Prep Area		
	Safety Signage		
	Restrooms		
	Information Kiosk		
1	Informational Signage	G	
	Benches		
	Playground		

Other (specify) _____

Courtesy/Fishing Docks: Condition Description (N-replace, R-repair, M-maintain, G-good): NA

☐ Courtesy Dock ☐ Fishing Dock Dimensions:_____ ☐ Universal Access

☐ Courtesy Dock ☐ Fishing Dock Dimensions:_____ ☐ Universal Access

Trails (within the recreation area): Condition Description (N-replace, R-repair, M-maintain, G-good):

Type: Access Road Length (ft): 10856.3 Condition: M ☐ Universal Access

Type:_____ Length (ft):_____ Condition:_____ ☐ Universal Access

Type:_____ Length (ft):_____ Condition:_____ ☐ Universal Access

Interpretive/Site Information: Condition Description (N-replace, R-repair, M-maintain, G-good): G

1 No. of Displays

☐ Boating Safety ☐ Invasive Species ☐ Fishing Regulations ☐ Fish Type

☐ Regional Events ☒ Other (specify) informative sign about the hike, dam, & nearby mount. ein

Signage: Condition Description (N-replace, R-repair, M-maintain, G-good): G

☐ Part 8 ☒ Directional ☒ Informational ☐ Other

Sanitation Facilities: Condition Description (N-replace, R-repair, M-maintain, G-good): NA

	# Flush	(# UA*)	# Portable	(# ADA)	Showers	(#UA)
Unisex	____	(____)	____	(____)	____	(____)
Women	____	(____)	____	(____)	____	(____)
Men	____	(____)	____	(____)	____	(____)

**UA = Universal Access*

Observed Vegetation and Erosion Impacts:

_____ Cut trees for fires
_____ Trampled vegetation
_____ Mowed areas
_____ Trees damaged by people
_____ Trees damaged by environment
_____ Areas of noticeable erosion

Description of Observations/Evidence of Vegetation Impacts: NA

Description of Observations/Evidence of Erosion: NA

Evidence of use at site: 0 - saw 15 people recreating on trail or at lake while conducting survey.
(C) Compaction, (E) Erosion, (G) Garbage, (GD) Ground disturbance, (HW) Human waste, (UI) Unauthorized improvements, (V) Vandalism, (VR) Vegetation removal, (O) Other (Specify)

Evidence of Overcrowding: NA
(A) Anecdotal information, (FA) facility/amenity @ capacity, (I) improper parking, (S) Signage, (SD) Site degradation, (U) Unauthorized sites, (W) Waiting lines, (O) Other (Specify)

Notes (including general condition, any restrictions/alerts, such as boating use, invasive species, etc.):
Trail is not really a trail, more of a multi-use service road that CVEA uses for access to the dam.

Photo number from _____ to _____ ← uploaded to sharepoint

Amenites WPT: 112, 117

Facilites WPT: 109, 114, 118

Signage WPT: 119, 108, 110, 111, 113, 115, 116

Sketch of Site and Facilities:

Amenities WPT:
112 (1352-end) - viewpoint over bay
117 (1414) - viewpoint at end

Facilite WPT:
104 (~~bridge~~) (Billy bridge) - swimming 118 - Gazebo, Picnic table, trash
114 - swimming

Signage WPT:
119 104 110 111 113 115 116

ATTACHMENT B

RECREATION USER SURVEY QR CODE FLYER

Recreation User Survey

Copper Valley Electric Authority (CVEA) welcomes you to the Solomon Gulch Hydroelectric Project.

CVEA is conducting a Recreation Study as part of the Federal Energy Regulatory Commission relicensing of the Solomon Gulch Project.

The Recreation User Survey can be completed on your mobile device or computer.

Participation is voluntary and responses will remain anonymous.

The online survey can be accessed at:

https://arcg.is/14vWTf

or

The survey will be available from the end of May 2024 through September 2, 2024. Please only complete one survey per individual.

Thank you in advance for your participation!

ATTACHMENT C

RECREATION USER SURVEY FORM

Copper Valley Electric Authority (CVEA) welcomes you to the Solomon Gulch Hydroelectric Project (Project) Recreation Use Survey. If you have participated in any recreational activities at the Project recreation site, John Hunter Memorial Trail, please take a moment to complete this brief survey. Your input will assist CVEA in determining if the existing recreation opportunities, including the facilities and amenities, are meeting current recreational needs.

1. Have you participated in this recreation survey before? If yes, thank you for your time. We are only accepting one submission per person with this survey. If not, please continue with the survey.

2. Date survey is being administered: _____

3. How many people were in your group at this recreation site, including yourself?

4. What is your ethnicity?

- ☐ American Indian and Alaska Native
- ☐ Asian
- ☐ Black or African American
- ☐ Hispanic or Latino
- ☐ Native Hawaiian and other Pacific Islander
- ☐ White
- ☐ Other
- ☐ Prefer not to Answer

5. What is your ZIP code? _____

6. Approximately how long (hours) was your visit to this recreation site today? _____

7. What was the **primary** recreational activity you participated in at the site today? (check one)

- ☐ Birding
- ☐ Dog Walking
- ☐ Running
- ☐ Photography
- ☐ Nature Observation
- ☐ Picnicking
- ☐ Sightseeing
- ☐ Scenery/Scenic Viewing
- ☐ Walking
- ☐ Other _____

What other activities did you participate in at the site today? (check as many as apply)

- ☐ Birding
- ☐ Dog Walking
- ☐ Running
- ☐ Photography
- ☐ Nature Observation
- ☐ Picnicking
- ☐ Sightseeing
- ☐ Scenery/Scenic Viewing
- ☐ Walking
- ☐ Other _____
- ☐

8. Please indicate which of the following activities you have participated in **at this site** in the past year. (Check all that apply in each season)

ACTIVITY	SPRING (APR 1– MAY 31)	SUMMER (JUN 1– AUG 31)	FALL (SEP 1- OCT 31)	WINTER (NOV 1– MAR 31)
Birding				
Dog Walking				
Nature Observation				
Photography				
Picnicking				
Running				
Scenery/Scenic View				
Sightseeing				
Walking				
Other:				

9. How crowded was this site today? (check one)

☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Not Crowded	Slightly Crowded	Somewhat Crowded	Moderately Crowded	Extremely Crowded

If crowding impacted your visit today, please explain how?

_____

10. Please indicate if your visit today was affected by any of the following?

☐ Traffic ☐ Weather ☐ Other Users ☐ Site Conditions ☐ None

11. Overall, please rate your satisfaction with the available recreation facilities at this site? (check one)

☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
Not Satisfied	Slightly Satisfied	Satisfied	More Than Satisfied	Extremely Satisfied

If less than "Satisfied" (rating 1 or 2) could you explain why? _____

12. Please provide an overall rating of the quality and condition of the facilities and amenities at the recreation site you visited on this trip. (circle number)

	Poor		**Fair**		**Excellent**
Parking	1	2	3	4	5
Safety Signage	1	2	3	4	5
Overall Site Condition	1	2	3	4	5

Please explain any poor (1 or 2) ratings: _____

13. How would you rate the **value** of this recreation site as a public recreation opportunity on a scale of 1 to 5? (circle number)

(Low) 1	2	3	4	5 (High)

14. Would you return to this recreation site over the course of the next year? (circle one) Yes No

Thank you for your time and input.

APPENDIX G

CULTURAL RESOURCES DRAFT STUDY REPORT – PRIVILEGED

Note that the Cultural Resources Study Report contains sensitive and confidential cultural resource information and is being filed with the Commission as **Privileged**. This document has been labeled as **CUI//PRIV—PRIVILEGED—DO NOT RELEASE**.

Members of the public may obtain nonpublic or privileged information by submitting a Freedom of Information Act (FOIA) request with FERC.