Rush Creek Project, FERC Project No. 1389

TERR 1 – Botanical Resources Technical Study Report

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Table of Contents

1.0 Introduction 1

2.0 Study Objectives 1

3.0 Study Elements 2

3.1 Study Elements Completed 2

3.1.1 Vegetation Alliances and Wildlife Habitats 2

3.1.2 Special-Status Plants 2

3.1.3 Non-Native Invasive Plants 3

3.1.4 Historic and Existing Botanical Resources within the Inundation Zones of Project Reservoirs 3

3.1.5 Riparian Community along Project-Affected Stream Segments 3

3.1.6 Riparian Community and Wetlands Within the Enhancement Area 4

3.2 Variances from the TERR 1 - TSP 4

3.3 Outstanding Study Elements 4

4.0 Extent of Study Area 5

5.0 Methods 5

5.1 Vegetation Alliances 6

5.1.1 Develop Vegetation Alliance Maps from Available CALVEG Data 6

5.1.2 Verify CALVEG Data Using Aerial Photographs 7

5.1.3 Conduct Ground-Truthing of Vegetation Alliances 7

5.1.4 Develop Final Vegetation Community Maps 8

5.2 Special-Status Plants 8

5.2.1 Develop Preliminary Information on Special-Status Plants and Mosses 9

5.2.2 Conduct Special-Status Plant and Moss Surveys 10

5.3 Non-Native Invasive Plants 13

5.3.1 Identify Existing NNIPs and Develop a List of Priority NNIPs 13

5.3.2 Conduct NNIP Surveys 13

5.4 Historic and Existing Botanical Resources within the Inundation Zones of Project Reservoirs 14

5.4.1 Historic Botanical Resources 14

5.4.2 Existing Botanical Resources 16
5.5 Riparian Community Along Project-Affected Stream Segments 18
5.5.1 Field Assessment of Riparian Communities Along Project-affected Stream Segments 18
5.5.2 Overview of Life History Requirements and Associated Vegetation Processes 20
5.6 Riparian and Wetland Communities in the Potential Enhancement Area 20
5.6.1 Documentation of the Riparian Community within the Potential Enhancement Area 20
5.6.2 Conduct an Aquatic Resources (Wetland) Delineation within the Potential Enhancement Area 21

6.0 Results 22

6.1 Vegetation Alliances 22
6.1.1 Document Vegetation Alliances and Wildlife Habitats in the Study Area 22
6.1.2 Develop Final Vegetation Community Maps in the Study Area 25
6.2 Special-Status Plants 25
6.2.1 Develop Preliminary Information on Special-Status Plants and Mosses 25
6.2.2 Conduct Special-Status Plant and Moss Surveys 25
6.3 Non-Native Invasive Plants 27
6.3.1 Develop Preliminary Information on Non-Native Invasive Plants in the Study Area 27
6.3.2 Non-Native Invasive Plant Studies 27
6.4 Historic and Existing Botanical Resources within the Inundation Zones of Project Reservoirs 29
6.4.1 Historic Botanical Resources 29
6.4.2 Existing Botanical Resources 30
6.4.3 Field Assessment of Riparian Communities 34
6.4.4 Riparian Vegetation Processes Overview 39
6.5 Riparian and Wetland Communities in the Potential Enhancement Area 39
6.5.1 Documentation of the Riparian Community 39
6.5.2 Aquatic Resources Delineation 40

7.0 Literature Cited 40

List of Appendices

Appendix A Aquatic Resources Delineation Report for the Rush Creek Project Potential Enhancement Area

Appendix B Results of Agency Consultation for Reference Population Visits

Appendix C Vegetation Alliances Occurring Within 1 Mile of the FERC Project Boundary

Appendix D Special-Status Plant Species Known to Occur or Potentially Occurring in the Study Area

Appendix E Comprehensive List of Plant Species Identified within the Project Area

Appendix F CNDDB Forms (CONFIDENTIAL)

Appendix G Representative Photographs of Special Status Plants and Habitat

Appendix H Target Non-Native Invasive Plant Species

Appendix I Representative Photographs of Non-Native Invasive Plants and Habitat

Appendix J Photographs of Botanical Transects within the Historic Inundation Zone of Project Reservoirs

Appendix K Waugh Lake Transects Plotted Against a Time Series of Waugh Lake Reservoir Elevations Since 2017

Appendix L Species Observed on Transects within the Historic Inundation Zone of Project Reservoirs

Appendix M Representative Photographs of Riparian Sampling Sites

Appendix N Summary Metrics of Graminoids, Herbs, Shrubs, and Trees on Botanical Transects within the Historic Inundation Zones of Project Reservoirs

Appendix O Riparian Vegetation Processes Overview

List of Tables

Table TERR 1-1. Project-affected Stream Segments, Reservoirs, and Selected Riparian Sampling Sites 45
Table TERR 1-2. Special Status Plants Identified in the Study Area 47
Table TERR 1-3. Non-native Invasive Plant Species Identified in the Study Area 49
Table TERR 1-4. Non-Native Invasive Plant Populations in the Study Area 51
Table TERR 1-5. Live Tree Core Sampling Information 55
Table TERR 1-6. Species Determinations for Stump Cross-Sections Collected within the Historical Inundation Zone of Project Reservoirs 56
Table TERR 1-7. Total Species Richness of Graminoids, Herbs, Shrubs, and Trees Within the Historic Inundation Zones of Project Reservoirs....60
Table TERR 1-8. Diameter at Breast Height of Trees Across Botanical Sampling Plots Within the Historic Inundation Zones of Project Reservoirs....60
Table TERR 1-9. Summary of Riparian Data Collected at Selected Riparian Sampling Sites 61
Table TERR 1-10. Dominant Woody Riparian Tree and Shrub Species Observed at Selected Riparian Sampling Sites 65
Table TERR 1-11. Riparian/Wetland Herbaceous and Graminoid Plants Observed at Selected Riparian Sampling Sites 67
Table TERR 1-12. Percent Cover, by Age Class and Species, of Woody Riparian Species in the Potential Enhancement Area 71

List of Figures

Figure TERR 1-1. Total Occurrences of Non-native Invasive Plants by Geographic Area 75
Figure TERR 1-2. Species Determinations for Stump Samples by Reservoir 76
Figure TERR 1-3. Transect Inundation Frequency Within Waugh Lake Since 2017 77
Figure TERR 1-4. Average Species Richness of Graminoids, Herbs, Shrubs, and Trees Across Historic Reservoir Inundation Zones 79
Figure TERR 1-5. Average Percent Cover of Graminoids, Herbs, Shrubs, and Trees in Plots Across Historic Reservoir Inundation Zones....80
Figure TERR 1-6. Shrub Height Compared Between Plots in the Historic Inundation Zone and Above Historic Ordinary High Water Mark....81
Figure TERR 1-7. Average Percent Cover of Woody Riparian Trees/Shrubs Across Selected Riparian Sampling Sites 83

List of Maps

Map TERR 1-1. CALVEG Vegetation Alliances Occurring Within the Study Area 87

Map TERR 1-1a. CALVEG Vegetation Alliances Occurring Within the Study Area 89

Map TERR 1-1b. CALVEG Vegetation Alliances Occurring Within the Study Area 91

Map TERR 1-1c. CALVEG Vegetation Alliances Occurring Within the Study Area 93

Map TERR 1-2a. Riparian Vegetation Alliances on Project-Affected Stream Segments and Project Reservoirs 95

Map TERR 1-2b. Riparian Vegetation Alliances on Project-Affected Stream Segments and Project Reservoirs 97

Map TERR 1-2c. Riparian Vegetation Alliances on Project-Affected Stream Segments and Project Reservoirs 99

Map TERR 1-2d. Riparian Vegetation Alliances on Project-Affected Stream Segments and Project Reservoirs 101

Map TERR 1-2e. Riparian Vegetation Alliances on Project-Affected Stream Segments and Project Reservoirs 103

Map TERR 1-2f. Riparian Vegetation Alliances on Project-Affected Stream Segments and Project Reservoirs 105

Map TERR 1-2g. Riparian Vegetation Alliances on Project-Affected Stream Segments and Project Reservoirs 107

Maps TERR 1-3a-i Special-Status Plant Species Occurring Within the FERC Project Boundary (Confidential) 109

Map TERR 1-4a. Non-Native Invasive Plant Species Occurring Within the FERC Project Boundary and Vicinity 111

Map TERR 1-4b. Non-Native Invasive Plant Species Occurring Within the FERC Project Boundary and Vicinity 113

Map TERR 1-4c. Non-Native Invasive Plant Species Occurring Within the FERC Project Boundary and Vicinity 115

Map TERR 1-4d. Non-Native Invasive Plant Species Occurring Within the FERC Project Boundary and Vicinity 117

Map TERR 1-4e. Non-Native Invasive Plant Species Occurring Within the FERC Project Boundary and Vicinity 119

Map TERR 1-4f. Non-Native Invasive Plant Species Occurring Within the FERC Project Boundary and Vicinity 121

Map TERR 1-4g. Non-Native Invasive Plant Species Occurring Within the FERC Project Boundary and Vicinity 123

Map TERR 1-4h. Non-Native Invasive Plant Species Occurring Within the FERC Project Boundary and Vicinity 125

Map TERR 1-4i. Non-Native Invasive Plant Species Occurring Within the FERC Project Boundary and Vicinity 127
Map TERR 1-4j. Non-Native Invasive Plant Species Occurring Within the FERC Project Boundary and Vicinity 129
Map TERR 1-4k. Non-Native Invasive Plant Species Occurring Within the FERC Project Boundary and Vicinity 131
Map TERR 1-4l. Non-Native Invasive Plant Species Occurring Within the FERC Project Boundary and Vicinity 133
Map TERR 1-4m. Non-Native Invasive Plant Species Occurring Within the FERC Project Boundary and Vicinity 135
Map TERR 1-4n. Non-Native Invasive Plant Species Occurring Within the FERC Project Boundary and Vicinity 137
Map TERR 1-4o. Non-Native Invasive Plant Species Occurring Within the FERC Project Boundary and Vicinity 139
Map TERR 1-4p. Non-Native Invasive Plant Species Occurring Within the FERC Project Boundary and Vicinity 141
Map TERR 1-4q. Non-Native Invasive Plant Species Occurring Within the FERC Project Boundary and Vicinity 143
Map TERR 1-5a. Location of Tree Stumps Within Historical Reservoir Inundation Zones 145
Map TERR 1-5b. Location of Tree Stumps Within Historical Reservoir Inundation Zones 147
Map TERR 1-5c. Location of Tree Stumps Within Historical Reservoir Inundation Zones 149
Map TERR 1-5d. Location of Tree Stumps Within Historical Reservoir Inundation Zones 151
Map TERR 1-5e. Location of Tree Stumps Within Historical Reservoir Inundation Zones 153
Map TERR 1-5f. Location of Tree Stumps Within Historical Reservoir Inundation Zones 155
Map TERR 1-6a. Transect and Sampling Plot Locations for Existing Botanical Resources Within Historical Reservoir Inundation Zones 157
Map TERR 1-6b. Transect and Sampling Plot Locations for Existing Botanical Resources Within Historical Reservoir Inundation Zones 159
Map TERR 1-6c. Transect and Sampling Plot Locations for Existing Botanical Resources Within Historical Reservoir Inundation Zones 161
Map TERR 1-6d. Transect and Sampling Plot Locations for Existing Botanical Resources Within Historical Reservoir Inundation Zones 163

Map TERR 1-6e. Transect and Sampling Plot Locations for Existing Botanical Resources Within Historical Reservoir Inundation Zones 165
Map TERR 1-7a. Riparian Sampling Sites, Transects, and Sampling Plots Along Waugh Lake and Selected Project-affected Stream Segments 167
Map TERR 1-7b. Riparian Sampling Sites, Transects, and Sampling Plots Along Waugh Lake and Selected Project-affected Stream Segments 169
Map TERR 1-7c. Riparian Sampling Sites, Transects, and Sampling Plots Along Waugh Lake and Selected Project-affected Stream Segments 171
Map TERR 1-7d. Riparian Sampling Sites, Transects, and Sampling Plots Along Waugh Lake and Selected Project-affected Stream Segments 173
Map TERR 1-7e. Riparian Sampling Sites, Transects, and Sampling Plots Along Waugh Lake and Selected Project-affected Stream Segments 175
Map TERR 1-7f. Riparian Sampling Sites, Transects, and Sampling Plots Along Waugh Lake and Selected Project-affected Stream Segments 177
Map TERR 1-7g. Riparian Sampling Sites, Transects, and Sampling Plots Along Waugh Lake and Selected Project-affected Stream Segments 179
Map TERR 1-7h. Riparian Sampling Sites, Transects, and Sampling Plots Along Waugh Lake and Selected Project-affected Stream Segments 181
Map TERR 1-8. Riparian Vegetation Alliances in the Potential Enhancement Area 183

List of Acronyms

AC	Alpine Grasses and Forbs Alliance
AX	Alpine Mixed Scrub Alliance
BA	barren
BL	Low Sagebrush alliance
BM	Curlleaf Mountain Mahogany Alliance
BQ	Great Basin Mixed Scrub Alliance
BS	Big Sagebrush Alliance
BX	Great Basin – Mixed Chaparral Transition Alliance
CALVEG	Classification with LANDSAT of Visible Ecological Groupings
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CRPR	California Rare Plant Rank
CSC	California Species of Special Concern
CV	snowbrush alliance
CX	Upper Montane Mixed Chaparral Alliance
dbh	diameter at breast height
EP	Eastside Pine Alliance
ESA	Endangered Species Act
FC	Federal Candidate for Listing
FE	Federal Endangered
FERC	Federal Energy Regulatory Commission
FM	Curlleaf Mountain Mahogany Alliance
FPD	Federal Proposed Delisted
FPE	Federal Proposed Endangered
FPT	Federal Proposed Threatened
FSCC	Inyo National Forest Service Species of Conservation Concern
FT	Federal Threatened
GIS	Geographic Information System

GPS	Global Positioning System
HG	Annual Grasses and Forbs Alliance
HJ	wet meadows alliance
IB	Urban-related Non-vegetated
INF	Inyo National Forest
IPaC	Information for Planning and Conservation (USFWS)
JP	Jeffrey Pine Alliance
LiDAR	Light Detection and Ranging
LP	Lodgepole Pine Alliance
MF	Mixed Conifer-Fir Alliance
NNIP	Non-Native Invasive Plant
NWI	National Wetlands Inventory
OHWM	Ordinary High Water Mark
PAD	Pre-Application Document
PISPP	unknown pine
Project	Rush Creek Project
QO	Willow Alliance
QQ	Quaking Aspen Alliance
SA	Subalpine Conifers Alliance
SCE	Southern California Edison Company
SE	state endangered
SR	state rare
SSP	Special-Status Plant
ST	state threatened
TSP	Technical Study Plan
TSR	Technical Study Report
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WA	water
WB	Whitebark Pine Alliance
WF	White Fir Alliance
WJ	Western (Mountain) Juniper Alliance
WL	Shrub Willow Alliance

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1.0 INTRODUCTION

This Technical Study Report (TSR) describes the methods and results developed by Southern California Edison Company (SCE) associated with implementation of the TERR 1 – Botanical Resources Technical Study Plan (TERR 1 – TSP) for the Rush Creek Project (Project). The TERR 1 – TSP was approved by the Federal Energy Regulatory Commission (FERC) on October 26, 2022, as part of its Study Plan Determination for the Project (FERC 2022). This report provides a detailed description of the methods and results of botanical studies (including vegetation alliance and wildlife habitats, special-status plants (SSP), non-native invasive plants (NNIP), and riparian and wetland resource studies) completed in 2023.

2.0 STUDY OBJECTIVES

The objectives of the botanical studies as described in the TERR 1 – TSP are provided below:

- Update vegetation alliances, including the riparian community, within 1 mile of the FERC Project boundary.
- Document SSP populations within the FERC Project boundary.
    - SSPs along the Project-affected stream segments were documented at riparian sampling sites. Refer to Table TERR 1-1 for a list of riparian sampling sites.
- Document NNIP populations within the FERC Project boundary. NNIPs along Project-affected stream segments were documented at riparian sampling sites. Refer to Table TERR 1-1 for a list of riparian sampling sites.
- Characterize historic and current botanical resources in the historic inundation zones of Project reservoirs, including:
    - Document the historic location, distribution, and size of trees within the inundation zones; and
    - Document current plant species composition, distribution, and abundance in the historic inundation zones.
- Characterize riparian resources at riparian sampling sites along Project-affected stream segments, including the relationship between the riparian community and stream flow.
- Document the riparian community and wetlands in the potential enhancement area.

3.0 STUDY ELEMENTS

Study elements described in the TERR 1 – TSP were initiated in 2023. A summary of the study elements that have been completed, outstanding study elements, and any deviations or proposed modifications to the TERR 2 – TSP are discussed in the following subsections.

3.1 STUDY ELEMENTS COMPLETED

3.1.1 Vegetation Alliances and Wildlife Habitats

- Developed vegetation alliance maps of the study area based on Classification and Assessment with Landsat of Visible Ecological Groupings (CALVEG) mapping and vegetation alliance descriptions.
- Verified the accuracy of CALVEG data and updated vegetation alliances using recent aerial photographs.
- Conducted ground-truthing of vegetation alliances within 1 mile of the FERC Project boundary.
- Documented small-scale riparian alliances along Project-affected stream segments and Project reservoirs.
- Developed a final Geographic Information System (GIS) map of vegetation alliances and overlaid information on Project facilities, construction areas, restoration areas, and the potential enhancement area.
- Developed a final GIS map of riparian vegetation alliances and overlaid information on the Project-affected stream segments and Project reservoirs.

3.1.2 Special-Status Plants

- Conducted a literature review and agency consultation to develop a list of SSPs potentially occurring in the study area.
- Conducted reference population checks on known occurrences of SSPs to verify the appropriate survey timing.
- Conducted focused SSP surveys within the study area.
- Collected moss and lichen specimens and submitted samples for identification to a qualified bryologist.
- Developed a comprehensive species list of plants observed during surveys.
- Developed a final GIS map of SSPs and overlaid information on Project facilities, construction areas, restoration areas, and the potential enhancement area.

3.1.3 Non-Native Invasive Plants

- Consulted with Forest Service to develop a list of priority NNIPs.
- Conducted focused NNIP surveys in conjunction with SSP surveys.
- Developed a comprehensive list of NNIPs and a final GIS map overlaid on Project facilities, construction areas, restoration areas, and the potential enhancement area.

3.1.4 Historic and Existing Botanical Resources within the Inundation Zones of Project Reservoirs

- Collected information on the location and size class of stumps within the inundation zones.
- Compared tree stump cross-sections to live tree cores to determine species identifications of the sampled stumps.
- Developed a GIS map of the location of stumps within the inundation zones.
- Established transects and sampling plots within the inundation zones to sample current plant communities.
- Developed tables of current plant species composition, distribution, and abundance within the inundation zones.
- Developed a GIS map showing the location of transects and sampling plots within the inundation zones.

3.1.5 Riparian Community along Project-Affected Stream Segments

- Conducted a literature review of life history requirements of dominant woody riparian species and associated riparian vegetation processes along stream corridors similar to Rush Creek.
- Conducted a field assessment of the riparian communities along selected Project-affected stream segments by establishing transects and sampling plots.
- Developed summary tables of riparian species composition, age class, abundance, and substrate classes within the stream segment transects.
- Developed a GIS map showing the location of transects and sampling plots within the inundation zones.

3.1.6 Riparian Community and Wetlands Within the Enhancement Area

- Conducted a field assessment to document riparian communities within the potential enhancement area.
- Developed summary tables of riparian species composition, age class, and abundance within the enhancement area.
- Developed a GIS map of riparian communities within the potential enhancement area.
- Conducted an aquatic resources delineation consistent with U.S. Army Corps of Engineers (USACE) protocols.
- Developed an aquatic resources delineation report and maps .

3.2 VARIANCES FROM THE TERR 1 - TSP

All studies were conducted consistent with the TERR 1 – TSP.

3.3 OUTSTANDING STUDY ELEMENTS

Considering the high water year in 2022–2023, the timing of some of the TERR 2 study elements was conducted later than anticipated, with some study elements not being completed until October 2023. Conditions in Waugh Lake (high reservoir levels) precluded collecting Light Detection and Ranging (LiDAR) imagery in 2023. LiDAR imaging will be completed in 2024 pending suitable field conditions. The following study elements are still in development at the time of this report and will be distributed in the Final License Application pending completion of LiDAR imaging and hydrologic modeling in 2024:

- Historical and Existing Botanical Resources within the Inundation Zones of Project Reservoirs
    - Develop a map of stump locations in the inundation zones of Project reservoirs using LiDAR imagery.
- Riparian Community Along Project-Affected Stream Segments
    - Characterize the relationship between riparian vegetation and flow conditions in the selected Project-affected stream segments.
    - Develop summary of the relationship between existing inundation characteristics and the distribution of dominant riparian species across the floodplain at each selected Project-affected stream segment.

4.0 EXTENT OF STUDY AREA

The extent of the study area for each study component is as follows:

- Vegetation alliances, includes areas within 1 mile of the FERC Project boundary.
    - The study area for small-scale riparian alliances includes areas along the Project-affected stream segments and reservoirs identified in Table TERR 1-1.
- SSP, moss, and lichen populations includes lands within the FERC Project boundary.
    - SSPs along the Project-affected stream segments were only documented at riparian sampling sites. Refer to Table TERR 1-1 for a list of riparian sampling sites.
- NNIP populations includes lands within the FERC Project boundary.
    - NNIPs along the Project affected stream segments were only documented at riparian sampling sites. Refer to Table TERR 1-1 for a list of riparian sampling sites.
- Historic and existing botanical resources includes the historic inundation zones of Project reservoirs.
- Characterization of the riparian community includes selected riparian sampling sites along Project-affected stream segments and reservoirs (refer to Table TERR 1-1).
- Documentation of the riparian community and wetlands in the potential enhancement area includes the potential enhancement area (i.e., portions of the Lower Rush Creek and South Rush Creek).[1]

Studies were not conducted at locations where access is unsafe (e.g., where there is very steep terrain).

5.0 METHODS

This section provides details on the methods for documentation of vegetation alliances and wildlife habitats, SSPs, NNIPs, historic and existing botanical resources within the historic inundation zones of Project reservoirs, riparian communities along Project-affected stream segments, and riparian and wetland resources in the potential enhancement area.

[1] The potential enhancement area includes portions of the Rush Creek and South Rush Creek channels upstream and downstream of State Route 158 crossing. The purpose of the potential enhancement is to address local flooding of residences during high-flow events.

5.1 VEGETATION ALLIANCES

The study approach for documenting vegetation alliances in the vicinity of the Project included development of preliminary vegetation alliance maps from available CALVEG data, verification of preliminary maps based on a review of Google Earth aerial photography, implementation of ground-truthing surveys, and development of final vegetation maps. Methods for each of these steps are described below.

5.1.1 Develop Vegetation Alliance Maps from Available CALVEG Data

The best available information on vegetation alliances in the study area was used to develop preliminary maps of vegetation alliances within 1 mile of Project facilities and riparian vegetation alliances along Project-affected stream segments. The approach for vegetation alliances and riparian vegetation alliances are described below.

5.1.1.1 Vegetation Alliances

Mapping of vegetation alliances utilized the CALVEG data for the study area (USDA-Forest Service [Forest Service] 2014). The CALVEG system is used to classify existing vegetation present on federally managed forestlands based on LANDSAT color infrared satellite imagery. Data were verified using soil-vegetation maps and professional guidance from various sources statewide.

The term “alliance” is used in the CALVEG system and is defined as a uniform group of plant associations sharing one or more dominant or diagnostic overstory species. This term corresponds closely to what plant ecologists call a “community type” and foresters call a “forest type” or “stand.” The term community is considered synonymous to the term “alliance” as defined by CALVEG.

Preliminary maps of CALVEG vegetation alliances are available in the Pre-Application Document (PAD), Section 4.6 (SCE 2021).

5.1.1.2 Riparian Vegetation Alliances

In addition to using the CALVEG system, preliminary maps of riparian vegetation alliances incorporated riparian features that were delineated during previous SCE studies (2017 a,b) and the United States Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Data (USFWS 2021). The National Wetlands system is the official USFWS wetland classification system and the Federal standard for wetland classification. Wetlands are classified by trained analysts at the USFWS that identify and classify wetland habitats from aerial imagery. Riparian and wetland mapping within the vicinity of the Project was based on 1985 imagery.

Preliminary maps of these riparian vegetation alliances are available in the PAD, Section 4.9 (SCE 2021).

5.1.2 Verify CALVEG Data Using Aerial Photographs

Pre-field verification of the preliminary vegetation community maps included a review of aerial photographs of the study area (Google Earth 2023). CALVEG data polygons, as shown on the preliminary maps, were compared to aerial photography in Google Earth. Areas where CALVEG data did not appear to correspond to the aerial photographs were marked on hard-copy maps as areas requiring follow-up examination during ground-truth surveys.

5.1.3 Conduct Ground-Truthing of Vegetation Alliances

The approach for ground-truthing of vegetation alliances and small-scale riparian alliances is described below.

5.1.3.1 Vegetation Alliances

Ground-truthing surveys for vegetation alliances were conducted in July 2023. Surveys were conducted in areas identified for follow-up examination during pre-field verification of the preliminary maps, as described above.

Ground-truthing surveys were conducted by a team of two biologists. The following data were collected throughout the study area: date and surveyor names; Global Positioning System (GPS) coordinates and location or facility name; CALVEG-designated vegetation community and field-assessed vegetation community (if different); general site summary; and wildlife species observed on the site. Ground-truthing surveys were not conducted in inaccessible areas. Inaccessible areas were evaluated using aerial imagery review (Google Earth 2023) and on-the-ground photographs taken from open vantage points, as appropriate.

Vegetation community type was verified by comparing dominant overstory species observed at each site with the dominant overstory species that characterize the vegetation community as described in the Field Key to CALVEG–South Sierran Zone 4 (Forest Service 2010) and Vegetation Descriptions South Sierran Ecological Province–CALVEG Zone 4 (Forest Service 2009). For sites in which the CALVEG-designated vegetation community on the preliminary maps did not appear to be correct, the new vegetation community was noted, and hard-copy vegetation community maps were marked to indicate the extent of the field-corrected vegetation community.

Distinct patterns between aerial imagery characteristics and vegetation alliances observed during the ground-truthing survey were used to extrapolate vegetation alliances within 1 mile of the FERC boundary that were inaccessible by foot. After returning from the field, such inaccessible areas were examined using high resolution Google Earth imagery (2023) and any vegetation alliances were corrected.

5.1.3.2 Riparian Alliances

Ground-truthing also included documentation of small-scale riparian alliances along Project-affected stream segments (refer to Table TERR 1-1) and around Project reservoirs. This ground-truthing was conducted during surveys of existing botanical resources within Project reservoirs, characterization of riparian communities along Project-affected stream segments, and documentation of riparian communities in the potential enhancement area. Refer to Section 5.4.2 for a description of methods for characterizing existing riparian resources within Project reservoirs. Section 5.5.1 provides a description of methods for characterizing riparian resources along Project-affected stream segments; and Section 5.6.1 provides a description of methods for documenting riparian communities in the potential enhancement area. Documentation of small-scale vegetation alliances followed the Manual of California Vegetation classification system (Sawyer et al. 2009), which defines vegetation alliances based on the dominant species present in the alliance.

Inaccessible areas were evaluated using aerial imagery review (Google Earth 2023) and on-the-ground photographs taken from open vantage points, as appropriate.

5.1.4 Develop Final Vegetation Community Maps

Final maps of vegetation alliances, including small-scale riparian alliances, were developed based on existing CALVEG data, review of Google Earth aerial photography, and ground-truth surveys.

Hard-copy corrections to vegetation community maps completed during review of aerial photographs and ground-truth surveys were digitized and incorporated into GIS layers.

5.2 SPECIAL-STATUS PLANTS

This section describes the approach used to document SSPs in the study area.

For the purposes of this report, a special-status species is defined as any plant species that is granted protection by a federal or state agency. Federally listed species granted status by USFWS under the Federal Endangered Species Act (ESA) include threatened (FT), endangered (FE), proposed threatened or endangered (FPT, FPE), candidate (FC), or listed species proposed for delisting (FPD).

The Inyo National Forest (INF) also maintains lists of plant species of conservation concern (FSCC) that were designated by the INF Forest Supervisor as part of the development of the INF's Revised Land Management Plant and Final Environmental Impact Statement (Forest Service 2019a).

State of California listed plant species, which are granted status by the California Department of Fish and Wildlife (CDFW) under the California Endangered Species Act (CESA) include state threatened (ST), endangered (SE), rare (SR), and California Species of Special Concern (CSC).

The California Native Plant Society (CNPS) maintains the California Rare Plant Ranks (CRPR), a ranking system for rare, threatened, or endangered plants in California. Under the California Environmental Quality Act (CEQA), SSPs include the following CRPR rankings:

- 1A (presumed extirpated in California and either rare or extinct elsewhere);
- 1B (rare, threatened, or endangered in California and elsewhere);
- 2A (presumed extirpated in California but common elsewhere); and
- 2B (rare, threatened, or endangered in California but common elsewhere).

5.2.1 Develop Preliminary Information on Special-Status Plants and Mosses

Provided below is a description of the development of preliminary information on SSPs, including mosses and lichens.

5.2.1.1 Identify and Map Known Occurrences of Special-Status Plants within the Study Area

A preliminary map of SSP and moss occurrences in the study area was developed in the PAD, Section 4.6 (SCE 2021). Based on this map, there is one special-status species previously known to occur in the study area, the whitebark pine (*Pinus albicaulis*) (FT). Two additional species have documented occurrences within 1 mile of the FERC Project boundary— the fell-fields claytonia (*Claytonia megarhiza)* (FSCC, CRPR 2B.3) and bog sandwort (*Sabulina stricta*) (CRPR 2B.3).

These preliminary PAD maps were then updated based on the following resources:

- Known occurrences of SSPs provided by stakeholders at the May 11, 2023, Terrestrial Working Group meeting; and
- New occurrences identified in the study area from the California Natural Diversity Database (CNDDB 2023).
- New occurrences identified in the study area from the California Native Plant Society (CNPS) Inventory of Rare and Endangered Plants (CNPS 2023).

5.2.1.2 Develop List of Special-Status Plant Species Potentially Occurring in the Study Area

A preliminary list of SSPs potentially occurring in the study area is available in the PAD, Section 4.6 (SCE 2021).

The following sources were reviewed for updated information on SSPs since the time the PAD was developed:

- INF List of At-Risk Plant Species, provided by the INF botanist on February 8, 2023 (INF 2023);
- CNPS's Electronic Inventory of Rare, Threatened, and Endangered Vascular Plants of California (CNPS 2023);
- CDFW's State and Federally Listed Endangered, Threatened, and Rare Plants of California (CDFW 2023);
- The California Natural Diversity Database (CNDDB 2023); and
- USFWS Information for Planning and Consultation (IPaC) Species List (USFWS 2023).

These sources were reviewed to obtain information on the status, blooming period or fertile period, elevation range, and habitat of SSPs or mosses potentially occurring in the study area. Information on documented occurrences of these plants within the study area were also obtained (as described in Section 4.2.1, above). This information was then used to compile a list of target SSP species for the focused SSP surveys.

5.2.2 Conduct Special-Status Plant and Moss Surveys

Focused SSP surveys were conducted to document the presence of SSPs in the study area using the following methods outlined below.

5.2.2.1 Survey Timing

Surveys for SSPs must be conducted at the proper time of year when rare, threatened, and endangered plants are both evident and identifiable, usually when the plants are flowering. Therefore, appropriate timing for conducting SSP surveys was determined based on a literature review of blooming periods for species potentially occurring in the study area, and in consideration of snowpack conditions in the spring of 2023. Based on the literature review and agency consultation, it was determined that two surveys, and early season survey in July/August and a late season survey in September, would be necessary.

The survey timing was further refined through monitoring of known SSP populations occurring in the vicinity of the Rush Creek Project. SCE coordinated with resource agencies (i.e., USFWS, INF, CDFW) to identify and confirm appropriate reference

populations and to conduct reference population monitoring. Two reference population visits were conducted, one prior to the early season surveys (July 6 and 7, 2023); and prior to the late season surveys (August 29 and 30, 2023). Refer to Appendix B for documentation of agency consultation for the reference population visits.

5.2.2.2 Survey Methods

All SSP surveys were conducted in accordance with the *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018). Two botanists searched for and recorded the occurrence of common plants and SSPs in the study area using various systematic field techniques (e.g., random meandering or zigzag or linear patterns), as appropriate. The entire survey area was covered on foot in accessible areas. Inaccessible areas were viewed with binoculars.

Surveys were floristic in nature, and nomenclature was based on The Jepson Manual (Baldwin et al. 2012), updated to the most recent taxonomy per the *Jepson eFlora* (Jepson Flora Project 2023). Plant species observed during field surveys were recorded and identified to the level necessary to determine whether they were an SSP, or a plant species with unusual or significant range extensions. Moss and lichen specimens were collected and labeled with the date and the collection location, as well as a description of the habitat where the specimen was located. Moss and lichen specimens were identified to species by John McLaughlin of San Jose State University, who is a qualified bryologist recommended by the University of California, Davis herbarium.

For each SSP population identified, the following data were recorded on datasheets and compiled into an electronic database:

- Date
- General Location
- GPS location coordinates (in North American Datum 83)
- Digital photograph number
- A description of the associated vegetation alliance
- Population size (i.e., polygon size)
- Approximate number of individuals

If a SSP species population was identified on the perimeter of the study area, the number of individuals within the study area was counted and these numbers were used to obtain an estimate of the number of individuals per acre. Then, if populations extended beyond study area, we assumed these estimates applied to vegetation alliances in which these populations were found.

CNDDB Field Survey Forms for each SSP population identified were submitted to CDFW.

During the SSP surveys in the vicinity of Gem Lake, Rush Creek below Rush Meadows Dam, and Waugh Lake, it was determined that one SSP, whitebark pine, was locally common in appropriate habitat. Biologists searched accessible areas around Rush Creek and the reservoirs for whitebark pine and its habitat.

Trees were identified using a guide to five-needle pines provided by the INF botanist (B. Engelhardt, pers. comm.). Trees lacking qualifying features necessary for identification (e.g., young trees) were classified as unknown five-needle pines and recorded separately from confirmed whitebark pines. The following are considered unique identifiable features for whitebark pine:

- Bark is cornflake-like and absent of deep furrows.
- Cones are closed and smaller than other five-needle pine species. Cones require animal agency (i.e., assistance) to open and are generally found torn apart.
- Cone scales do not have seed wing scars.
- Trees are generally multistemmed.

Because the whitebark pine populations were often widespread, and extended into steep and inaccessible terrain, the following methods were implemented to document the extent of whitebark pine/unknown five-needle pine populations and the number of individuals in the study area:

- Whitebark pines and unknown five-needle pines observed to be in discrete stands (i.e., greater than 100 feet away from other trees or separated by geographic features) were recorded using points collected on GPS units. The total number of whitebark pines and unknown five-needle pines at these points were recorded.
- Whitebark pine trees and unknown five-needle pines observed to be part of a larger stand were mapped within the FERC Project boundary using hard copy map markups. Population edges were determined based on distance from other whitebark pines (greater than 100 feet away) and/or by the presence of natural boundaries (e.g., steep cliffs, granitic outcrops, or bodies of water). Due to the large number of trees, GIS coordinates were not obtained for individual trees; instead biologists counted the total number of whitebark pines and unknown five-needle pines within the boundaries of each population.
- In many cases, whitebark pines were a consistent component of forest alliances which extended well beyond the FERC Project boundary. In these cases, botanists viewed the habitats outside of the FERC Project boundary on foot or using binoculars; took photographs; and noted observations on forest composition and condition to characterize whitebark pine outside of the study area.

- Inaccessible areas within the FERC Project boundary were surveyed for the presence of whitebark pines using binoculars. If five-needle pine trees were observed by binoculars in these inaccessible areas, they were classified as unknown five-needle pines. The number of individuals was estimated by counting the number of visible trees.

5.2.2.3 Develop Comprehensive Species List and Map of Special-Status Plant Populations

Following completion of the surveys, maps were developed by overlaying GIS layers of the location of SSP populations in relation to the study area. Tables were then developed listing each SSP population, its size (i.e., area in square feet), the estimated number of individuals in the population, and associated Project facilities and features. Any SSPs observed during the course of any other technical studies were also included on the map and tables.

5.3 NON-NATIVE INVASIVE PLANTS

The Final Environmental Impact Statement for the INF Land Management Plan defines invasive species, including plants, as "alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health; species that cause, or is likely to cause harm and that is exotic to the ecosystem it has infested (Forest Service 2019b). The study approach for NNIPs is provided below.

5.3.1 Identify Existing NNIPs and Develop a List of Priority NNIPs

Existing information on NNIPs in the study area was obtained and reviewed from the following sources:

- PAD Section 4.6, Botanical and Wildlife Resources (SCE 2021)
- Invasive Plant List for the INF (INF 2023)

Based on the above definitions, a target NNIP list was developed for the NNIP surveys.

5.3.2 Conduct NNIP Surveys

NNIP surveys were conducted concurrently with focused SSP surveys in July, August, and September of 2023. NNIP surveys were conducted consistent with Section 2083 of the *Forest Service Manual, Information and Reporting Guidelines for Noxious Weeds* (Forest Service 1995). Two botanists searched for and recorded the occurrence of target NNIP species in the study area using various systematic field techniques (e.g., random meandering or zigzag or linear patterns), as appropriate. The entire survey area was covered on foot in accessible areas. Inaccessible areas were scanned with binoculars, as appropriate.

If a NNIP population was identified on the perimeter of the study area, the study area was expanded to document the full extent of the population.

For each NNIP population identified, the following data were recorded:

- Species
- Date
- General Location
- GPS coordinates
- Population size (i.e., area in square feet and acres)
- Infestation level: low (<5 percent cover); moderate (6-25 percent cover); and high (>25 percent cover).

GIS layers showing the location of NNIPs were overlaid on maps of the study area. Because the study area often contained more than one NNIP species in a single location, overlapping NNIP populations were grouped together into inclusive polygons for mapping purposes. These polygons were categorized by the number of NNIP species found. Data tables were developed providing the following information for individual NNIP species: unique identification number; NNIP species; GPS coordinates; population size (i.e., square feet and acres); and infestation level (i.e., low, moderate, or high).

5.4 HISTORIC AND EXISTING BOTANICAL RESOURCES WITHIN THE INUNDATION ZONES OF PROJECT RESERVOIRS

Historically, reservoir levels were higher on Waugh, Gem, and Agnew lakes prior to the seismic restrictions. New reservoir operations were initiated in 2012 and formalized in 2016 (FERC 2016) as a result of seismic restrictions on reservoir elevations. These restrictions significantly reduced the combined storage capacity of Waugh, Gem, and Agnew lakes. Therefore, the maximum ordinary high water lines of the reservoirs are much lower than their historic levels. Specific methods used for the characterization of both historic and existing botanical resources within the historic inundation zones of Project reservoirs are provided below.

5.4.1 Historic Botanical Resources

This section describes studies that were implemented to obtain information on the historic location, distribution, size, and species of trees within the historical inundation zone of Project reservoirs.

5.4.1.1 Tree Stump Location and Distribution

Initially, LiDAR, aerial photogrammetry, and/or supplemental total stations surveys were planned within the Project reservoirs. This information was to be used to identify and map tree stumps within the inundation zones. However, because lake levels were higher than usual in the fall of 2023, which was a wet water year, LiDAR, aerial photogrammetry, and supplemental total station data were not collected in the study area in 2023. Therefore,

the location and distribution of tree stumps was assessed using recent Google Earth imagery (2023), field photographs, and on-the-ground mapping efforts in accessible areas. These sources were then digitized and incorporated into a GIS map to show the location and distribution of tree stumps within the Project reservoirs.

5.4.1.2 Tree Stump Size and Species Determinations

Sampling locations were chosen to accurately capture tree diversity within the reservoir ranging from the waterline in 2023 to the top of the historical inundation zones.

The TERR 1–TSP proposed using a transect methodology to randomly sample tree stumps within 5 meters along each side of a transect line placed within the reservoir. However, based on the field distribution of tree stumps and the limited number of stumps with suitable characteristics for sampling (i.e., stumps with visible tree rings that were not in a worn and degraded conditions), this randomized approach was abandoned, and samples were instead taken from the highest quality stumps located at sampling points across the reservoirs. To the extent possible, surveyors took samples from different aspects and elevations of the reservoirs to capture tree stump diversity.

The following information was collected at each stump sampling location:

- GPS coordinates
- Photograph of stump
- Diameter of stump at ground level. Diameter of the stump at ground level was taken using a standard diameter at breast height (dbh) forestry tape.
- A cross-section of the stump was obtained for species determinations. Cross-sections were taken using a Silky Katanaboy 500 folding saw using the methods described in Truettner et al. 2018. Cross-sections were approximately 3 inches thick to preserve the cellular characteristics in the center of the cross-section.

Stump species were determined by comparing stump cross-sections with live tree cores that were taken from living trees in the forest community surrounding the reservoir. Whitebark pine, while present in the forest community surrounding the reservoir, was not sampled because of its protected status. Tree cores were taken using an increment borer, following the methods described in Truettner et al. (2018).

- The dbh of the live tree was taken using a standard dbh forestry tape.
- A tree core was extracted using an increment borer in a direction parallel to the slope contours. Two tree cores were taken per sampled tree to preserve data in the event a tree core sampled were damaged during transport out of the field or was otherwise unsuitable for analysis. To reduce the potential for the spread of tree pathogens, all equipment was appropriately sterilized prior to use in the field in accordance with standard methods (Grissino-Mayer 2003, Tsen et al. 2015). After each tree core was extracted, the increment borer and core extractor were

cleaned with a 50 percent ethanol solution to sanitize the equipment before moving on to the next tree.

- GPS coordinates of the tree location were also recorded.

Once the tree stump samples and live tree cores were taken from the field, the samples were processed in the laboratory by a qualified dendrochronologist. Stump cross-sections were mounted onto a board and sanded to reveal wood which had not been exposed to the air. The cross sections were then examined to enable species identification. Tree cores were mounted and sanded to serve as reference samples to allow verification of the stump species. The stump species were determined by visually comparing cellular characteristics of the stumps under a compound microscope to the cellular characteristics of known reference samples (i.e., tree cores).

After identification of the samples, a map showing the sampling locations for the tree stumps and the live tree cores was developed. A table summarizing the number, size, and species identification of the stumps was then developed.

5.4.2 Existing Botanical Resources

Existing botanical resources in the inundation zones of Project reservoirs were evaluated using transects distributed across the reservoirs. As described above, initially, LiDAR, aerial photogrammetry, and/or supplemental total stations surveys were planned within the Project reservoirs. These layers would then be used to identify areas within the inundation zones that currently support plant communities. Recent Google Earth imagery (2023) was used to determine appropriate areas for sampling. The approach for transect selection and sampling methodology to characterize existing botanical resources is described below.

5.4.2.1 Transect Selection

Transects were established within the inundation zones of Waugh, Gem, and Agnew lakes to allow for characterization botanical resources at various elevations and conditions (e.g., upland and riparian areas). Historical transect locations established during previous botanical studies at Waugh and Gem lakes (Psomas 2017) were utilized, as appropriate. Of the nine transects previously established at Waugh Lake, seven were retained, and two were relocated to capture riparian vegetation on the south shoreline to the northwest end of the lake.

All six transects previously established at Gem Lake were retained.

Five new transects at Agnew Lake were established from review of aerial imagery to capture diverse vegetation conditions in the inundation zone. Most of the inundation zone in Agnew Lake is characterized by barren and rocky talus slopes; therefore, selected transects were focused in areas most likely to support vegetation.

Transects were sampled from the current waterline of the reservoir and extended to the top of the historical inundation zone (i.e., historic ordinary high water mark [OHWM]). The transect was established perpendicular to the waterline. Both ends of the transect were marked with orange pin flags during sampling. Transect start and end points were recorded with a Trimble Geo7x GPS unit, which records coordinates with sub-meter accuracy. Photographs were taken at the start and end points of each transect. Upon completion of sampling along the transect, the orange pin flags were removed and were packed out of the study area.

5.4.2.2 Sampling Methodology

Five- by 5-meter sampling plots were placed along each transect. The number of plots varied at each transect depending on the length of the transect, as well as the complexity and variety of vegetation at the site. At each transect, one plot was placed at the top of the transect above the historical inundation zone; the remaining plots were placed to adequately sample visible vegetation and to capture changes in vegetation structures/types along the transect. One plot was also taken above the historic OHWM of the reservoir. The following data was collected within each sampling plot:

- GPS coordinates (center point of each plot)
- Photograph of the plot
- List of plant species, separated by graminoids, herbaceous plants, shrubs, and trees
- Percent cover within each sampling plot for graminoids, herbaceous plants, shrubs, and trees.
- Number of stems and approximate height (for shrubs) and dbh (for trees)

Plant nomenclature was based on The Jepson Manual (Baldwin et al. 2012), updated to the most recent taxonomy per the *Jepson eFlora* (Jepson Flora Project 2023).

Once all field data was collected, a GIS map was developed showing the location of transects and sampling plots. Tables and figures were also developed to summarize plant species composition, distribution, and abundance within the transects. Species were categorized as either graminoid, herb, shrub, or tree species.[2]

Following data collection, a summary of botanical characteristics within the historic inundation zones was then developed. Specifically, we evaluated whether there was natural recruitment within the reservoir historic inundation zone, and summarized patterns across reservoirs in the composition and distribution of graminoid, herb, shrub, and tree species.

[2] For the purposes of this study, graminoids are defined as herbaceous plants with a grass-like morphology that have long, blade-like leaves. Typical graminoids include grasses (Poaceae), sedges (Cyperaceae), and rushes (Juncaceae). Herbs are defined as all other herbaceous plants. Shrubs are defined as woody plant species that typically lack a defined central trunk. Trees are defined as woody plant species that typically have a defined central trunk.

5.5 RIPARIAN COMMUNITY ALONG PROJECT-AFFECTED STREAM SEGMENTS

The study approach for the characterization of the riparian community along Project-affected stream segments includes two main components—a field assessment of riparian communities along Project-affected stream segments, and an overview of the life history of dominant woody species and associated riparian vegetation processes. The methods for each component are provided in detail below.

5.5.1 Field Assessment of Riparian Communities Along Project-affected Stream Segments

The field assessment of riparian communities in 2023 included mapping the extent of riparian vegetation along selected stream segments and establishing and collecting data along transects. Each component is described further below.

5.5.1.1 Mapping Riparian Vegetation

Riparian vegetation along Project-affected stream segments was mapped using high-resolution aerial imagery available from Google Earth (2023). Changes in the characteristics of the vegetation, such as color, height of canopy, and inundation patterns were used to delineate the boundaries of riparian vegetation. Riparian communities were classified according to *A Manual of California Vegetation* (Sawyer et al. 2009) based on dominant species composition. Dominant species composition was determined based on the results of field transects, as described below.

5.5.1.2 Riparian Transects

Seven Project-affected stream segments were selected for riparian sampling in coordination with the AQ 1 – Instream Flow and AQ 5 – Geomorphology studies. Refer to Table TERR 1-1 for a list of the seven stream segments (referred to in this study as "riparian sampling sites").

One of the Project-affected stream segments, Rush Creek below Rush Meadows Dam, is the subject of long-term riparian monitoring. Monitoring is conducted by SCE at three sites along this stream segment consistent with Forest Service Final 4(e) Condition No. 7 under the existing license (FERC 1997).[3] Long-term monitoring data was last collected at stream segment in 2022. A full description of the riparian sampling methods for this stream segment is available in the final monitoring report filed with FERC on April 25, 2023 (E Read and Associates, Inc. 2023). This stream segment was not revisited as part of the TERR 1 studies conducted in 2023. Rather, we have incorporated the results of the 2022 study for the purposes of comparisons between Project-affected stream segments.

[3] Sites 1 and 2 along the Rush Creek below Rush Meadows Dam stream segment contain three transects, while Site 3 is a photo-monitoring location only. Refer to Map TERR 1-7 for the location of these long-term riparian monitoring sites. Transect locations at these sites are confidential because sensitive scientific equipment is installed at these transects (E. Read and Associates 2023).

The methods described below apply to the remaining six riparian sampling sites. A minimum of three transects were established at each riparian sampling site. Transects were established by the instream flow surveyors by drilling pins into bedrock or tree roots, labelling with metal tags, and marking the edges of vegetation with flagging (for more information, please refer to AQ 1 – Instream Flow TSR). Transect locations were selected to represent the range of riparian conditions observed along the stream segments.

Because high flow conditions prevented safe stream access earlier in the season, riparian vegetation was sampled at each of these transects in early September of 2023. The approach for surveying riparian vegetation at each transect included establishing at least two 5- x 5- meter sampling plots along each transect. The plots started at the bankfull line of the transect and continued outwards to the edge of riparian vegetation, moving away from the stream. The number and location of plots along each transect varied depending on width of the riparian corridor along the transect.

The following data was collected at each sampling plot:

- GPS coordinates (center point of each plot)
- Digital photograph of the plot
- Percent cover for each dominant woody riparian trees/shrubs, by species
- Age class for each dominant woody riparian trees/shrubs, by species. Age class structure was determined based on categories of shrub stem densities per individual and tree diameters, as follows:
    - Young (Y): shrubs with less than 10 stems per individual or trees with dbh less than 3 inches;
    - Medium-aged (M): shrubs with between 10 and 60 stems per individual or trees with dbhs between 3 and 9 inches; and
    - Old/Mature (O): shrubs with more than 60 stems per individual or trees with dbhs greater than 9 inches.
- Size class of the substrate present (bedrock, boulder, cobble, gravel, sand, and silt).

A GIS map showing the location of the transects and sampling plots was then developed. Lists and tables were then developed summarizing the species composition, distribution, and abundance across Project-affected stream reaches.

5.5.2 Overview of Life History Requirements and Associated Vegetation Processes

Once the dominant species had been identified in the field, a literature review was conducted to summarize the life history requirements of the dominant woody riparian species occurring along Rush Creek, and to describe associated riparian vegetation processes. The approach to the literature review included the following steps:

- Existing scientific papers and technical reports were reviewed to summarize the following life history requirements of the dominant woody riparian species observed along Rush Creek:
  - Seed initiation (e.g., dispersal, germination, and initial seed/root growth);
  - Microsite characteristics necessary for germination (e.g., water table depth, substrate);
  - Establishment patterns (e.g., survival and growth until maturity); and
  - Maturation (e.g., age of maturity, rooting depth, and tree height).
- Based on the literature review, summary of patterns of riparian vegetation establishment was developed. This summary included the role of hydrological events (magnitude, frequency, timing, flow recession, inundation) in the establishment and/or scouring of riparian vegetation.

To the extent possible, literature focusing on riparian systems within the eastern Sierra Nevada was used to develop these summaries. Riparian species can behave differently under different climatic regimes, elevations, and stream types; therefore, using existing information close in geographic scope to the Rush Creek Project would be the best predictor of riparian dynamics along Project-affected stream segments.

5.6 RIPARIAN AND WETLAND COMMUNITIES IN THE POTENTIAL ENHANCEMENT AREA

Provided below is a description of the methods to document the riparian community and conduct an aquatic resources (wetland) delineation within the potential enhancement area.

5.6.1 Documentation of the Riparian Community within the Potential Enhancement Area

A field assessment was conducted to document riparian communities within the potential enhancement area using the following steps.

Before the field assessment was conducted, riparian vegetation within the potential enhancement area was mapped using high-resolution aerial imagery from 2018. The boundaries of vegetation alliances were clearly visible on the aerial imagery.

During the field assessment in 2023, riparian communities were classified according to their dominant species composition based on A Manual of California Vegetation (Sawyer et al. 2009). These riparian communities were then mapped with GIS and overlaid onto the 2018 aerial imagery.

An inventory of dominant woody riparian shrubs and trees was conducted within the enhancement area. Two biologists surveyed the enhancement area and recorded the following information within each riparian community:

- Age classes of all woody riparian trees/shrubs, by species. Age class structure was determined based on categories of shrub stem density per individual and tree diameters, as follows:
    - Young (Y): shrubs with less than 10 stems per individual or trees with dbh less than 3 inches;
    - Medium-aged (M): shrubs with between 10 and 60 stems per individual or trees with dbhs between 3 and 9 inches; and
    - Old/Mature (O): shrubs with more than 60 stems per individual or trees with dbhs greater than 9 inches.
- Percent cover, by age class and species, within each riparian community identified in the potential enhancement area.

Following the field assessment, a final map of riparian communities in the potential enhancement area was developed. The overall percent cover of riparian vegetation in the potential enhancement area was then calculated. Tables summarizing percent cover for each dominant species, by age class, in the riparian community were also developed.

5.6.2 Conduct an Aquatic Resources (Wetland) Delineation within the Potential Enhancement Area

An aquatic resources delineation was conducted to determine the location of jurisdictional waters of the U.S./state (e.g., wetlands) within the potential enhancement area.

The wetland delineation was conducted according to USACE standard protocols, which included the methodology described in the following manuals:

- USACE Wetlands Delineation Manual (Environmental Laboratory 1987);
- A Field Guide to the Identification of the OHWM in the Arid West Region of the Western United States (Lichvar and McColley 2008); and
- Regional Supplement to the USACE Wetland Delineation Manual: Arid West Region (Version 2.0) (USACE 2008).

A full description of the methods is available in the aquatic resources delineation report, provided in Appendix A. =

6.0 RESULTS

This section provides details on the results for documentation of vegetation alliances, SSPs, NNIPs, historic and existing botanical resources within the historic inundation zones of Project reservoirs, riparian communities along Project-affected stream segments, and riparian and wetland resources in the potential enhancement area.

6.1 VEGETATION ALLIANCES

The following sections present the results of the vegetation alliance and wildlife habitat studies completed in 2023.

6.1.1 Document Vegetation Alliances and Wildlife Habitats in the Study Area

The results for both vegetation alliances and riparian vegetation alliances are described below.

6.1.1.1 Vegetation Alliances

Preliminary vegetation alliance maps based on the existing CALVEG data for the study area were completed in 2021 and were included in the PAD (SCE 2021). Preliminary vegetation alliance maps were ground-truthed during wildlife reconnaissance surveys conducted in July 2023, and from recent aerial imagery sources (Google Earth 2023).

Ground-truthing identified several inconsistencies in the preliminary vegetation alliance maps that were corrected. For example, the slope along the western shore of Agnew Lake was classified as shrub willow alliance (WL) but was more accurately classified as snowbrush alliance (CV) based on dominant vegetation observed during ground-truthing. Some areas around Waugh Lake were classified as subalpine conifers alliance (SA); however, recent aerial imagery indicated barren areas (BA). Some areas classified as wet meadows (HJ) on the slopes surrounding Waugh Lake were also reclassified to barren areas or water (WA). These inconsistences were corrected in the final map product.

The ground-truthing identified 26 CALVEG alliances in the study area, including the following:

- Herb-dominated Alliances:
    - Alpine Grasses and Forbs Alliance (AC)
    - Annual Grasses and Forbs Alliance (HG)
    - Wet Meadows Alliance

- Shrub-dominated Alliances:
  - Alpine Mixed Scrub Alliance (AX)
  - Low Sagebrush Alliance (BL)
  - Curlleaf Mountain Mahogany Alliance (BM)
  - Great Basin Mixed Scrub Alliance (BQ)
  - Big Sagebrush Alliance (BS)
  - Great Basin – Mixed Chaparral Transition Alliance (BX)
  - Snowbrush Alliance
  - Upper Montane Mixed Chaparral Alliance (CX)
  - Shrub Willow Alliance
- Tree-dominated Alliances:
  - Eastside Pine Alliance (EP)
  - Curlleaf Mountain Mahogany Alliance (FM)
  - Jeffrey Pine Alliance (JP)
  - Lodgepole Pine Alliance (LP)
  - Mixed Conifer-Fir Alliance (MF)
  - Willow Alliance (QO)
  - Quaking Aspen Alliance (QQ)
  - Subalpine Conifers Alliance (SA)
  - Whitebark Pine Alliance (WB)
  - White Fir Alliance (WF)
  - Western Juniper Alliance (WJ)

- Non-Vegetated Areas:
  - Barren
  - Urban-related Non-vegetated (IB)
  - Water

Higher elevation portions of the study area contained more subalpine conifer, lodgepole pine, and alpine grasses and forbs alliances; while lower elevation portions of the study area contained more eastside pine, western juniper, and shrub-dominated alliances containing sagebrush (i.e., BL, BQ, BS, BX). Barren areas dominated by rock outcrops are present throughout the study area.

Refer to Appendix C for a detailed description of each of the CALVEG alliances identified in the study area.

6.1.1.2 Riparian Alliances

Preliminary riparian alliance maps based on the existing CALVEG data for the study area were completed in 2021 and were included in the PAD (SCE 2021). Preliminary riparian alliance maps were ground-truthed during riparian surveys conducted in September 2023 (refer to Section 5.5, below).

The field survey identified seven Manual of California Vegetation riparian alliances adjacent to Project-affected stream segments, including the following:

- *Pinus contorta* ssp. *murrayana* Forest and Woodland Alliance (Lodgepole Pine Forest and Woodland)
- *Populus tremuloides* Forest and Woodland Alliance (Aspen Groves)
- *Salix boothii* – *Salix geyeriana* – *Salix lutea* Shrubland Alliance (Booth's Willow – Geyer's Willow – Yellow Willow Thickets)
- *Salix exigua* Shrubland Alliance (Sandbar Willow Thickets)
- *Salix lasiolepis* Shrubland Alliance (Arroyo Willow Thickets)
- *Salix lemmonii* Shrubland Alliance (Lemmon's Willow Thickets)
- *Salix orestera* Shrubland Alliance (Sierra Gray Willow Thickets)

In general, higher elevations of the study area contain shrubland alliances dominated by Sierra gray willow (*Salix orestera*) and yellow willow (*Salix lutea*). Lower elevation areas contained more quaking aspen (*Populus tremuloides*), Geyer's willow (*Salix geyeriana*), Arroyo willow (*Salix lasiolepis*), and narrowleaf willow (*Salix exigua*). Lemmon's willow (*Salix lemmonii*) was found throughout the study area. Lodgepole pine (*Pinus contorta*

spp. *murrayana*) was often the dominant overstory component of riparian alliances and was often found growing up to the OHWM of Project-affected stream segments. Refer to Section 6.4.2, below, for more detailed information on riparian communities in the historic inundation zone of Project reservoirs. Refer to Section 6.5.1, below, for more detailed information on riparian communities in selected riparian sampling sites. Refer to Section 6.6.1, below, for more detailed information of riparian communities in the potential enhancement area.

6.1.2 Develop Final Vegetation Community Maps in the Study Area

Refer to Maps TERR 1-1a–c for the location of CALVEG alliances within 1 mile of the FERC Project Boundary.

Refer to Maps TERR 1-2a–g for the location of Manual of California Vegetation riparian alliances along Project-affected stream segments.

6.2 SPECIAL-STATUS PLANTS

The following sections present the results of the SSP studies completed in 2023.

6.2.1 Develop Preliminary Information on Special-Status Plants and Mosses

Based on information from the PAD; supplemental literature review; and input from INF botanists, 80 SSP and moss species were determined to have the potential to occur in the study area. This includes two species documented as historically occurring within the FERC Project boundary—whitebark pine (FT), and alpine bent grass (Agrostis humilis) (FSCC, CRPR 2B.3). Two additional species have documented occurrences within 1 mile of the FERC Project boundary—fell-fields claytonia (FSCC, CRPR 2B.3) and bog sandwort (CRPR 2B.3). A list of special-status plant species known to occur or potentially occurring in the Study area is provided in Appendix D.

6.2.2 Conduct Special-Status Plant and Moss Surveys

Provided below is a description of the results of reference population surveys, SSP surveys, and SSP map development.

6.2.2.1 Reference Population Surveys

Two reference population visits were conducted in the early season and late season:

- **Early Season**: The early season reference population visit was conducted on July 6 and July 7, 2023. Reference populations of Lemmon's milk-vetch (*Astragalus lemmonii* – FSCC, CRPR 1B.2), Long Valley milk-vetch (*Astragalus johnson-howellii* – FSCC, CRPR 1B.2), Mono Lake lupine (*Lupinus duranii* – FSCC, CRPR 1B.2), and golden violet (*Viola purpurea* ssp. *aurea* – FSCC, CRPR 2B.2) were visited by two biologists. These populations were located at lower elevations that were free of snowmelt. In addition, biologists attempted to visit two higher elevation reference populations of scalloped moonwort (*Botrychium*

crenulatum – FSCC, CRPR 2B.2) and western valley sedge (*Carex vallicola* – FSCC, CRPR 2B.3). These populations were located along Tioga Pass Road, which had not been cleared of snow at the time of the reference population visit. Based on the visit, it was determined in consultation with resource agencies that mid-to -late July was the appropriate time period to conduct early season surveys at lower elevations in the study area, and that mid-August was the appropriate time period to conduct early season surveys at the higher elevations of the study area.

- **Late Season:** The late season reference population visit was conducted on August 29 and August 30, 2023. CDFW biologist Michael Tovar participated in the August 29 reference population visit. Reference populations of mountain bentgrass (*Agrostis humilis* – FSCC, CRPR 2B.3), tall draba (*Draba praealta,* CRPR 2B.3), Torrey's blazing star (*Mentzelia torreyi* – FSCC, CRPR 2B.2), white-stemmed pondweed (*Potamogeton praelongus,* CRPR 2B.3), Robbins' pondweed (*Potamogeton praelongus,* CRPR 2B.3), short-fruited willow (*Salix brachycarpa* var. *brachycarpa,* CRPR 2B.3), Oregon campion (*Silene oregana,* CRPR 2B.2), dune horsebrush (*Tetradymia tetrameres* – FSCC, CRPR 2B.2), and foxtail thelypodium (*Thelypodium integrifolium* ssp. *complanatum* – FSCC, CRPR 2B.2) were visited. Based on the visit, it was determined in consultation with resource agencies that early-to-mid-September was the appropriate time period to conduct late season surveys in the study area.

6.2.2.2 Special-status Plant Surveys and Maps

One SSP, whitebark pine, was identified in the study area. No other SSPs (including mosses) were observed. Refer to Appendix E for a list of plants and mosses observed in the study area.

A total of 49 whitebark pine populations including 38 populations identified as whitebark pines, and 11 populations which lacked mature bark and cones and, therefore, were identified as unknown five-needle pines. These populations occupy approximately 58 acres in the study area. Refer to Map TERR 1-3 for the location of each population. Table TERR 1-2 provides the unique population ID, total number of individuals, size in square feet and acres, and associated vegetation alliance for each population. Appendix F provides the California Native Species Field Survey Form submitted to the CNDDB for whitebark pine.

Based on the quantity of white bark pines and unknown five-needle pines observed within the study area and the acreage of the mapped populations, the following describes patterns of whitebark pine occurrence in and surrounding the study area:

- There was a higher density of whitebark pines within the Lodgepole Pine Alliance and the Subalpine Conifer Alliance than other vegetation alliances occurring within the FERC boundary.

- The Subalpine Conifer Alliance contained a higher density of mature whitebark pines at approximately 54 per acre, and unknown five-needle pines at approximately 69 per acre.

- The Lodgepole Pine Alliance generally supported lower densities (13 whitebark pines per acre and 54 unknown five-needle pines per acre).

- In general, north facing slopes had a much higher density of whitebark pines and unknown five-needle pines than other aspects and no whitebark pines or unknown five-needle pines were observed below an elevation of 8,500 feet.

Appendix G provides representative photographs of whitebark pines and typical habitat in the study area.

6.3 NON-NATIVE INVASIVE PLANTS

The following sections present the results of the NNIP studies completed in 2023.

6.3.1 Develop Preliminary Information on Non-Native Invasive Plants in the Study Area

Based on preliminary information, one NNIP species, cheatgrass (*Bromus tectorum*), was identified as known to occur in the vicinity of the study area. Thirty-seven additional NNIP species were identified as potentially occurring within 1 mile of the study area. These 38 species were determined to be the target species for the TERR-1 NNIP surveys. The list of target NNIP species is provided in Appendix H. This list was developed through consultation with the INF, the primary federal agency maintaining a target list of non-native species recommended for management in the vicinity of the Rush Creek Project.

6.3.2 Non-Native Invasive Plant Studies

Provided below is a discussion of the results of NNIP surveys conducted in the study area.

A total of 13 weed species were detected in the study area during the TERR-1 NNIP surveys (refer also to Table TERR 1-3):

- Cheatgrass

- Spotted knapweed (*Centaurea stoebe*)

- Bull thistle (*Cirsium vulgare*)

- White sweet clover (*Melilotus albus*)

- Prostrate knotweed (*Polygonum aviculare*)

- Curly dock (*Rumex crispus*)

- Russian thistle (tumbleweed) (*Salsola tragus*)

- Soapwort (Saponaria officinalis)
- Red sandspurry (*Spergularia rubra*)
- Common dandelion (Taraxacum officinale)
- Yellow salsify (*Tragopogon dubius*)
- White clover (Trifolium repens)
- Common mullein (*Verbascum thapsus*)

In addition, biologists conducting studies in support of the AQ 1 – Instream Flow TSP observed growth of filamentous algae, in Rush Creek below Silver Lake. In 2024, during implementation of the AQ 6 TSP, this filamentous algae, if observed, would be collected to test for presence of *Didymo.*

Appendix I provides representative photographs of the 13 non-native invasive weed species detected in the study area. Table TERR 1-4 provides a summary of the 103 NNIP occurrences mapped within the study area including: scientific name, common name, unique population ID and facility, level of infestation, INF priority status (i.e., ranking), population size (in square feet and acres), and survey date. Many populations overlapped between species resulting in fifty-three mapped areas with the overlap between species accounting for all 103 populations. The location and extent of NNIPs are depicted on Map TERR 1-4.

Figure TERR 1-1 below displays the occurrences of NNIPs at each area in the Project vicinity. NNIPs were most abundant in the vicinity of the Rush Creek Powerhouse. Seven NNIP species were solely observed at this location including:

- 2 populations of red sandspurry
- 7 populations of yellow salsify
- 1 population of spotted knapweed
- 2 populations of prostrate knotweed
- 1 population of Russian thistle
- 1 population of soapwort
- 4 populations of white clover

The most common species observed throughout the study area were cheatgrass, with 43 total populations (approximately 21 acres), and common mullein, with 16 total populations (approximately 19 acres). Other NNIP species occurred as smaller populations intermixed with the more widespread species.

The occurrences of each species and their location is provided in Table TERR 1-4.

6.4 HISTORIC AND EXISTING BOTANICAL RESOURCES WITHIN THE INUNDATION ZONES OF PROJECT RESERVOIRS

The results of studies of the historic and existing botanical resources within the historic inundation zones of Project reservoirs are provided below.

6.4.1 Historic Botanical Resources

Tree stump mapping and sampling was conducted between September 25 and 29, 2023. The results of the mapping of the distribution of tree stumps and tree stump size and species determinations are provided below.

6.4.1.1 Tree Stump Location and Distribution

Refer to Map TERR 1-5a–f for the location of stumps mapped within the historical reservoir inundation zones. In general, the historical inundation zone of Waugh Lake had the greatest abundance of tree stumps surrounding the reservoir. Gem Lake and Agnew Lakes were characterized by steep rocky slopes and tree stumps were only present within a subset of locations.

6.4.1.2 Tree Stump Size and Species Determinations

Representative tree core samples were taken from five tree species that were observed in the forest community surrounding the reservoirs: western juniper (*Juniperus occidentalis*), lodgepole pine, Jeffrey pine (*Pinus jeffreyi*), western white pine (*Pinus monticola*), and mountain hemlock (*Tsuga mertensiana*). Two tree cores were taken from trees at Waugh Lake, two tree cores were taken from trees at Gem Lake, and one tree core was taken from Agnew Lake. Refer to Table TERR 1-5 for information on the trees from which cores were taken.

A total of 49 stump cross-sections were taken from tree stumps within the historical inundation zones of Project reservoirs. Eighteen stump cross-sections were taken from Waugh Lake, 15 samples were taken from Gem Lake, and 16 samples were taken from Agnew Lake. Refer to Map TERR 1-5a–f for stumps sampling locations. After sanding to reveal wood that had not been exposed to air, the microscopic characteristics of the wood were compared to the tree core samples to determine species identification.

The following species determinations were made for the 18 stump cross-sections taken at Waugh Lake:

- Ten lodgepole pine,
- Seven pines of unknown species (*Pinus* spp.), and
- One mountain hemlock.

The following species determinations were made for the 15 stump cross-sections taken at Gem Lake:

- Ten western juniper,
- Two mountain hemlock,
- One lodgepole pine,
- One Jeffrey pine, and
- One pine of unknown species.

The following species determinations were made for the 16 stump cross-sections taken at Agnew Lake:

- Eight Jeffrey pine,
- Three western juniper,
- Three western white pine, and
- Two pines of unknown species.

Refer to Table TERR 1-6 for the species determination and diameter at ground level for each of the stumps sampled within the historic inundation zones of Project reservoirs. Refer to Figure TERR 1-2 for a graphic showing species composition by location.

Some stump cross-sections had intermediary characteristics between different pine species collected for analysis. Unknown pines (PISPP) were similar to *Pinus contorta* ssp. *murrayana,* but had wider latewood, more resinous areas, and often had multiple stems near the main sampled stump base. The PISPP stump cross-sections did not match the characteristics of lodgepole pine, but were identified as matching general *Pinus* characteristics by the dendrochronologist. Because whitebark pine is a listed species that could have core samples collected from live individuals, it is unknown whether stump samples identified as PISPP are whitebark pine or another pine species.

Western juniper was the dominant species sampled at Gem Lake but is not the dominant vegetation alliance surrounding Gem Lake (refer to Map TERR 1-1b for vegetation alliances). It is expected that juniper was the dominant species identified in Gem Lake through cross-section samples because *Juniperus* wood degrades more slowly (i.e., the wood is denser and more fibrous) than other tree species in the surrounding forest community.

6.4.2 Existing Botanical Resources

The spring and summer of 2023 was a wet water year and the reservoirs filled during the runoff period. Therefore, surveys were delayed until water levels had receded to allow for collection of data in the historic inundation zone. Transects were surveyed between September 18 and 25, 2023.

6.4.2.1 Transect and Plot Selection

A total of 21 botanical transects were established in the reservoir inundation zones, including nine transects established at Waugh Lake, six transects at Gem Lake, and five transects at Agnew Lake. At least three plots were placed along each transect. A total of 68 plots were sampled— 31 plots were sampled at Waugh Lake, 21 plots were sampled

at Gem Lake, and 16 plots were sampled at Agnew Lake. At each transect, the first plot was always placed close to the current waterline, the second plot was placed mid-way along the transect, and the last plot was placed above the historic OHWM. Plots were placed to capture variations at different inundation zone elevations.

Refer to Map TERR 1-6 for the location of transects within the historic inundation zones of the reservoirs and the plots distributed along each transect. Refer to Appendix J for a photograph of each transect from the waterline looking towards the historic OHWM of the reservoirs.

6.4.2.2 Summary of Existing Botanical Resources

A general summary of the botanical resources within the inundation zones of Waugh, Gem, and Agnew lakes is presented below.

The reservoirs showed natural recruitment of species within the inundation zones. The majority of the species observed growing within the reservoir inundation zones (152 of 157 total species or 97 percent) were native species. Agnew Lake was the only reservoir where INF priority NNIP species were observed in sampling plots (for more information, refer to Map TERR 1-4). While the historic inundation zones are naturally revegetating, overall cover of vegetation per plot was low, indicating an early successional state compared to vegetation in plots placed above the historic OHWM.

Waugh Lake had the highest average species richness of graminoids per transect relative to other reservoirs, with sedges (*Carex* spp.) being the most abundant species. Grasses were more commonly observed at Gem and Agnew lakes. Average percent cover of herbs per plot was relatively similar across the reservoirs.

In plots within the historic inundation zone, total shrub cover was generally less than plots above the historic OHWM. Willows were the dominant shrubs observed at Waugh and Gem lakes but were mostly distributed along those transects that ran parallel to tributary streams. Willows observed in the historic inundation zone at Agnew Lake were also more mature than willows observed at Gem and Waugh lakes and not dependent on presence of a tributary stream.

For the most part, only young tree seedlings were observed within the historic inundation zones of the reservoirs. Lodgepole pine was the predominant species observed at Waugh Lake. Quaking aspen and lodgepole were the most commonly observed species at Gem and Agnew lakes. Trees were most abundant in the upper portions of transects, where they were less likely to be inundated. Plots in the historic inundation zone of Waugh Lake had lower average cover of shrubs and trees compared to Gem and Agnew lakes. This pattern may be related to the wide fluctuation in Waugh Lake reservoir elevation. Refer to Figure TERR 1-3, above, for a visual of transect inundation since 2017. Refer to Appendix K for graphs showing a time series of Waugh Lake Reservoir elevations plotted against the transect elevation ranges. The transects were periodically inundated during this time, and vegetation would have to survive seasonal flooding.

Provided below is a more detailed description of botanical resources within the inundation zone of Waugh, Gem, and Agnew lakes, including species diversity, percent cover, shrub height, and tree dbh across the transects and plots.

6.4.2.2.1 Species Diversity

A total of 157 plant species were observed within the three inundation zones, including 53 graminoid species, 74 herb species, 24 shrub species, and six tree species. Refer to Table TERR 1-7, below, for the total species richness of graminoid, herb, shrub, and tree species observed in each reservoir.

Refer to Figure TERR 1-4, below, for the average species richness at each transect. Waugh Lake had the highest average species richness of graminoids. Agnew Lake had the highest average shrub species richness and Waugh Lake had the lowest average shrub species richness. The average species richness of herbs and trees was similar across reservoirs.

The most widespread graminoid species (i.e., observed at more than one transect at each reservoir) included rough bentgrass (*Agrostris scabra*), Alaska brome (*Bromus sitchensis*), slenderbeak sedge (*Carex athrostachya*), chamisso sedge (*Carex pachystachya*), brown sedge (*Carex subfusca*), squirreltail (*Elymus elymoides*), Mexican rush (*Juncus mexicanus*), fowl bluegrass (*Poa palustris*), and Wheeler's bluegrass (*Poa wheeleri*).

The most widespread herb species included rockcresses (*Boechera* spp.), fringed willowherb (*Epilobium ciliatum*), and Fendler's meadow rue (*Thalictrum fendleri*).

The most widespread shrub species (i.e., observed at least one transect at each reservoir) included oceanspray (*Holodiscus discolor*), gooseberry currant (*Ribes montigenum*), narrowleaf willow, arroyo willow, yellow willow, and Sierra gray willow.

The most widespread tree species included whitebark pine and lodgepole pine. Jeffrey pine was only observed at Agnew Lake transects. Mountain hemlock was only observed at Waugh and Gem lakes. Quaking aspen was only observed at Gem and Agnew lakes.

Refer to Appendix L for a comprehensive species list by transect and reservoir.

6.4.2.2.2 Percent Cover

Total vegetative cover was low within plots within the historic inundation zone (see photographs in Appendix M), with much of the plot containing only barren sediments or exposed bedrock.

Percent cover of graminoids, herbs, shrubs, and trees within the sampled plots were variable both between reservoirs and between plots within the historic inundation zones versus the plots placed just above the historic OHWM.

Average percent cover of graminoids was higher in plots within the historic inundation zone compared to plots above the historic OHWM. Because the reservoir beds are open and lack tree cover, graminoids may be able to grow more easily than under cover of trees and shrubs. Agnew Lake had the highest average percent cover of graminoids within the historic inundation zone, while Gem Lake had the lowest. Refer to Figure TERR 1-5a for the average percent cover of graminoids between reservoirs. Average percent cover of herbs was relatively low (<20 percent) across both plots within and above the historic OHWM, with the exception of Agnew Lake above the OHWM (~35 percent). Because herbs tend to have fleshier above-ground vegetation, herbs may be more vulnerable to desiccation within the highly exposed historic inundation zone and therefore, may not experience the same competitive release as the graminoids. Refer to Figure TERR 1-5b, above, for the average percent cover of herbs between reservoirs.

Average percent cover of shrubs was much higher within the plots above the historic OHWM at Waugh and Gem lakes, but interestingly, was roughly equivalent at Agnew Lake. Even though Agnew Lake historic inundation zone plots had roughly the same average percent cover as plots above the historic OHWM, the species composition differed. Agnew Lake had a much higher amount of willows (*Salix* spp.) growing within the historic inundation zone, while the slopes above the reservoir were dominated by little sagebrush (*Artemisia arbuscula*), curl-leaf mountain mahogany (*Cercocarpus ledifolius*), and bitter cherry (*Prunus emarginata*). In general, willows were usually the abundant shrubs found within plots in the historic inundation zones, while plots above the historic OHWM contained more upland shrub species. Refer to Figure TERR 1-5c, above, for the average percent cover of shrubs between reservoirs.

Average percent cover of trees was significantly lower within plots in the historic inundation zone compared to the plots above the historic OHWM. A large number of lodgepole pine seedlings were observed on several transects within the historic inundation zone of Waugh and Gem lakes. Refer to Figure TERR 1-5d, above, for the average percent cover of trees between reservoirs.

Refer to Appendix N for the raw percent cover and number of individuals within each plot and transect for graminoids, herbs, shrubs, and trees.

6.4.2.2.3 Shrub Height

To further assess differences in shrub age between plots in the historic inundation zone versus plots above the historic OHWM, refer to Figure TERR 1-6, below. Both the average height of shrubs and the ranges of heights within the inundation zone of Waugh Lake were significantly lower than shrubs above the historic OHWM. The average height of shrubs within Gem Lake was also lower, but the range of heights was similar. In Agnew Lake, both the average and the range of shrub heights within plots in the historic inundation zone was higher than plots above the historic OHWM. Because Agnew is at lower elevation and experiences a longer growing season, shrubs may be able to grow more quickly than at the higher elevations of Gem and Waugh.

6.4.2.2.4 Tree DBH

Refer to Table TERR 1-8 for an assessment of differences in tree age between plots in the historic inundation zone versus plots above the historic OHWM. Only young seedlings and saplings were found within the historic inundation zones. Mature trees with dbh greater than 1 inch were only found in plots above the historic OHWM. Therefore, tree establishment within the historic inundation zone is very recent. Riparian Community Along Project-Affected Stream Segments

The results of the field assessment of riparian communities along Project-affected stream segments and the literature review of riparian processes in the Sierra Nevada are provided below.

6.4.3 Field Assessment of Riparian Communities

Refer to Section 6.1.1 for a general description of riparian alliances present along Project-affected stream reaches and Maps TERR 1-2a-g for the location of Manual of California Vegetation riparian alliances identified along Project-affected stream segments.

A description of the structure and composition of the riparian community at each of the Project-affected stream segments sampled during this study is provided below. The slope, substrate, and gradient of the stream segments significantly affect the distribution and riparian vegetation in the study area. Table TERR 1-1 presents the dates that each riparian sampling site was sampled.

Refer to Maps TERR 1-7a-h for the location of riparian sampling sites, transects, and plots. Refer to Appendix M for representative photographs of each riparian sampling site. Table TERR 1-9 provides summary data on the total percent cover and species richness for woody riparian trees/shrubs and herbaceous/graminoid plants, as well as the age classes of woody riparian trees/shrubs, for each riparian sampling site. Table TERR 1-10 provides a comprehensive list of woody riparian species observed by riparian sampling site. Figure TERR 1-7, below presents the average percent cover of dominant woody riparian species for each riparian sampling site. Table TERR 1-11 provides a comprehensive list of the herbaceous and graminoid plant species observed by riparian sampling site.

Waugh Lake

Four transects were established at the Waugh Lake riparian sampling site[4]. Transects were approximately evenly spaced between Rush Meadows Dam and the upstream portion of the historic lake where Rush Creek inlets into the historic lakebed.

[4] Waugh Lake was historically a storage reservoir until seismic studies identified a potential safety concern in 2007. The reservoir level was lowered significantly to address the seismic concern, starting in 2013. The spillway at the Rush Meadows Dam was notched in 2018 to allow flows to pass downstream more easily in high runoff years. As a result of the lowered lake levels, the lakebed of Waugh Lake has been intermittently exposed, with the reservoir filling seasonally as meltwater fills the historic reservoir bed, and then water levels receding to expose a more stream-like system.

Compared to other riparian sampling sites, Waugh Lake had the lowest percent cover of woody riparian trees/shrubs (an average of 1.4 percent cover in each plot) and only two different species were recorded, including young yellow willow and lodgepole pine (refer to Figure TERR 1-7). Sampling plots typically had an average of 0.5 woody riparian tree/shrub species (meaning that many plots did not have any trees/shrubs at all), and all the individuals observed in the plots were the young age class. This is likely because Waugh Lake substrates have only been exposed for recruitment in the last 10 years, and the exposed reservoir bed experiences wide fluctuations in water levels under current conditions.

Waugh Lake also had the lowest percent cover of herbaceous and graminoid plants compared to other riparian sampling sites (an average of 23.6 percent cover across plots). Sampling plots had variable species richness (ranging from 2–10 species), with an average of approximately five species in each plot. Graminoids were the most abundant herbaceous cover, with sedges (*Carex* spp.), rushes (*Juncus* spp.), and grasses (Poaceae) being the most commonly observed species. A few herbaceous species such as tinker's penny (*Hypericum anagalloides*), fringed willowherb, and mountain jewelflower (*Streptanthus tortuosus*) were also observed. These species are characteristic of early successional areas with high disturbance.

Substrates observed in the plots included bedrock, boulder, cobble, gravel, silt, and sand.

Rush Creek Below Rush Meadows Dam

As stated in Section 5.5.1 above, riparian vegetation was sampled in August 2022 as part of the Forest Service Final 4(e) Condition No. 7 – Monitoring under the existing license (FERC 1997). A summary of the riparian vegetation characteristics present in 2022 are provided below. Full details, including a discussion of long-term riparian trends, are provided in the 2023 report available on the FERC website (E Read and Associates, Inc. 2023).

Riparian vegetation along Rush Creek below Rush Meadows Dam is mainly dominated by willows, with an overstory of lodgepole pine forest. The cover of willows and other riparian shrubs across transects were approximately 25 percent at both Site 1 and Site 2. The cover of conifers across transects, mainly of lodgepole pine, was approximately 58 percent at Site 1 and 37 percent at Site 2. Refer to Figure TERR 1-7 for the average cover of riparian shrubs, upland conifers, and upland shrubs across both sites. Across both sites, there were a total of 10 woody riparian/shrub species recorded. No recruitment of young willow seedlings was observed in 2022, but information on the other age classes (medium and old) was not recorded as part of the long-term monitoring conditions. The dominant woody riparian species observed included lodgepole pine, Sierra gray willow, mountain willow (Salix eastwoodiae), mountain heather (Phyllodoce breweri), Labrador tea (Rhododendron columbianum), and western blueberry (Vaccinium uliginosum var. occidentale).

Due to the high overstory density in the transects, the cover of herbaceous vegetation is relatively low. Cover of riparian herbaceous species was approximately 18 percent and 5 percent at Site 1 and 2, respectively. Cover of upland herbaceous species was approximately 10 percent (Site 1) and 1 percent (Site 2). Across both sites, there were a total of 49 herbaceous species recorded across transects. Dominant species included

sedges (*Carex* spp.), bluejoint (*Calamagrostis canadensis*), Donner woodrush (*Luzula subcongesta*), mountain pride (*Penstemon newberryi*), and Wheeler's bluegrass. One special-status plant, mountain bentgrass (FSCC, CRPR 2B.3), was observed on transect surveys conducted in 2022, but not in other previous years (E. Read and Associates, Inc. 2023). Refer to Map TERR 1-3 for the location of where this species was observed.

Note that the belt transect sampling methods used by E Read and Associates, Inc., covered a larger area than the 5- by 5- meter plot methodology used for the remainder of the sites, and were therefore more likely to encounter a greater number of species.

Rush Creek Below Agnew Dam

Three transects were established at the Rush Creek below Agnew Dam riparian sampling site between Agnew Dam, and just beyond the Agnew Flume. Rush Creek below Agnew Dam flows in a bedrock canyon, and riparian vegetation mostly occurs in a narrow strip, though a relatively wider riparian band has established just upstream of the Agnew Flume.

Compared to the other riparian sampling sites, Rush Creek Below Agnew Dam had moderate cover of woody riparian vegetation (an average of 79.1 percent cover across plots). Rush Creek below Agnew Dam had the highest average species richness compared to other riparian sampling sites (an average of 3.6 species in each plot), and 11 total woody riparian tree/shrub species were recorded. All age classes (young, medium, and old) were observed. The most abundant woody riparian species were arroyo willow, narrowleaf willow, Goodding's willow (*Salix gooddingii*), and American dogwood (*Cornus sericea*) (refer to Figure TERR 1-7). Arroyo willow and narrowleaf willows are species that are adapted to frequent disturbance and are often the first to establish on newly formed fluvial deposits (Sacchi and Price 1992, Stella et al. 2006).

Compared to other riparian sampling sites, Rush Creek below Agnew Dam had a lower percent cover of herbaceous and graminoid plants (an average of 37.1 percent cover in each plot). Sampling plots had variable species richness (ranging from one to nine species), with an average of approximately five species in each plot. 18 total herbaceous/graminoid species were observed. The most commonly observed graminoid species included bluejoint, sedges, mountain rush (*Juncus balticus*), and *Poa* grasses. The most commonly observed herbaceous species included tarragon (*Artemisia dracunculus*), field horsetail (*Equisetum arvense*), Bigelow's sneezeweed (*Helenium bigelovii*), Rocky Mountain iris (*Iris missouriensis*), and starry false lily of the valley (*Maianthemum stellatum*).

Substrates observed in the plots included bedrock, boulder, cobble, gravel, silt, and sand.

Rush Creek Above Silver Lake (River Mile 17.55)

Three transects were established around River Mile 17.55 at the Rush Creek Above Silver Lake riparian sampling site. The upstream portion of Rush Creek Above Silver Lake runs through the Rush Creek Powerhouse complex and joins with South Rush Creek, Reversed Creek, and the Rush Creek Powerhouse Tailrace in the potential enhancement area. Rush Creek has a relatively high gradient after the Rush Creek Horsetail Falls, and then transitions

to a shallower gradient as it flows under State Route 158 in the valley surrounding Silver Lake. The meeting of several different streams creates a floodplain system, where the riparian community is frequently inundated in the spring/summer after snowmelt.

Compared to the other riparian sampling sites, Rush Creek Above Silver Lake (River Mile 17.55) had the highest cover of woody riparian vegetation (an average of 104.3 percent cover across plots). Species richness averaged three species per plot, and eight total woody riparian tree/shrub species were recorded. All age classes (young, medium, and old) were observed. The most abundant woody riparian species were lodgepole pine, quaking aspen, arroyo willow, Lemmon's willow, and American dogwood, with occasional Pacific willow (*Salix lasiandra*) (refer to Figure TERR 1-7). Willows were typically restricted to a narrow and intermittent band immediately along the active bank of the stream channel, while lodgepole pine and aspen dominated the overstory. Woody riparian vegetation throughout the potential enhancement area was thoroughly inventoried and is further described in Section 6.6.1 below.

Rush Creek Above Silver Lake (River Mile 17.55) had moderate cover of herbaceous and graminoid plants (an average of 73.7 percent cover in each plot). Sampling plots had the lowest average species richness recorded (ranging from one to three species), with an average of 2.3 species observed in each plot and only five total herbaceous/graminoid species observed. The most commonly observed graminoid species were field horsetail, scouringrush horsetail (*Equisetum hyemale*), and panicled bulrush (*Scirpus microcarpus*). The high cover of woody riparian vegetation in the overstory, often with several overlapping canopy layers, may prevent herbaceous and graminoid species from accessing light for growth.

Substrates observed in the plots included boulder, cobble, gravel, silt, and sand.

Rush Creek Above Silver Lake (River Mile 17.05)

Three transects were established at River Mile 17.05 at the Rush Creek Above Silver Lake riparian sampling site. This portion of Rush Creek Above Silver Lake meanders through a large meadow system before the creek outlets into Silver Lake. This portion of Rush Creek Above Silver Lake lies on a relatively low gradient and sections of the creek have very deep pools. The meadow system is frequently inundated after snowmelt.

Compared to the other riparian sampling sites, Rush Creek Above Silver Lake (River Mile 17.55) has a patchy distribution of woody riparian vegetation. Though the plots had an average of 50.6 percent cover of woody riparian vegetation across the sampling sites, individual plots ranged from 0 cover to 118 percent cover (i.e., overlapping species). All age classes (young, medium, and old) were observed. Species richness ranged from 0 to four species per plot, and five total woody riparian tree/shrub species were recorded. The most abundant woody riparian species were Lemmon's willow, arroyo willow, Pacific willow, and Geyer's willow, with a few scattered lodgepole pine (refer to Figure TERR 1-7). Willow thickets were the densest and tallest observed out of any of the riparian study sites.

Compared to the other riparian sampling sites, Rush Creek Above Silver Lake (River Mile 17.55) had high cover of herbaceous/graminoid vegetation, although this was patchy and dependent on whether the sampling plot contained woody riparian vegetation. The percent cover of herbaceous/graminoid vegetation ranged from 28 to 135 percent cover across plots. Species richness varied from two to seven species per plot (average of four species across plots), and 14 total species were recorded. Graminoids predominated in these plots, with species growing with dense overlapping cover. The most abundant species included lakeshore sedge (*Carex lenticularis*), woolly sedge (*Carex pellita*), Northwest Territory sedge (*Carex utriculata*), and panicled bulrush. Often the substrate was not even visible underneath the tangle of rhizomes.

Substrates observed in the plots included gravel, silt, and sand. Most plots had a thick organic soil horizon layer. On the bank, the organic soil layer met with an abrupt transition to the deep channel of Rush Creek.

Rush Creek Below Silver Lake

Three transects were established at the Rush Creek Below Silver Lake riparian sampling site. This portion of Rush Creek Below Silver Lake follows a moderate gradient through a U-shaped valley before the creek outlets into Grant Lake. Rush Creek Below Silver Lake contains a narrow riparian forest community along the banks and is surrounded by sagebrush (*Artemisia* spp.) habitats on surrounding terraces and slopes.

Compared to the other riparian sampling sites, Rush Creek Below Silver Lake has the second highest cover of woody riparian vegetation, with an average of 96.7 percent cover across plots (ranging from 27 to 142 percent cover). All age classes (young, medium, and old) were observed. Species richness ranged from one to five species per plot, and eight total woody riparian tree/shrub species were recorded. The most abundant woody riparian species were lodgepole pine, quaking aspen, Woods' rose (Rosa woodsii), narrowleaf willow, arroyo willow, and Pacific willow (refer to Figure TERR 1-7). Willows were typically restricted to the immediate edges of the bank, while lodgepole pine and quaking aspen were dominant in the overstory. In some areas, the riparian corridor widens along wider bends of the creek, where the substrate is typically inundated for longer periods of the season. In these areas, willows predominate and the aspen and lodgepole pine overstory is sparser.

Compared to the other riparian sampling sites, herbaceous/graminoid cover was relatively high, but variable. Percent cover varied from 0 to 155 percent cover, with an average of 79.9 percent cover across the plots. Species richness ranged from 0 to seven species, with an average of approximately four species in each plot. Seventeen species of herbaceous/graminoid species were recorded in total. The most abundant graminoid species included bluejoint, water sedge (*Carex aquatilis*), woolly sedge, blue wildrye (*Elymus glaucus*), and Kentucky bluegrass (*Poa pratensis*). The most abundant herbaceous species were field horsetail, smooth horsetail (*Equisetum laevigatum*) and Canada goldenrod (*Solidago elongata*).

Substrates observed in the plots included boulder, cobble, gravel, silt, and sand.

South Rush Creek

Three transects were established at the South Rush Creek riparian sampling site. This portion of South Rush Creek follows a relatively high gradient from the connection of Rush Creek Horsetail Falls until South Rush Creek intersects with another un-named perennial stream and flows into a culvert under State Route 158. Near this intersection, a wet meadow has formed, with a forest overstory of lodgepole pine and quaking aspen.

Compared to the other riparian sampling sites, South Rush Creek has a moderate cover of woody riparian vegetation, with an average of 73.4 percent cover across plots (ranging from 29 to 145 percent cover). All age classes (young, medium, and old) were observed. Species richness ranged from one to six species per plot, and 10 total woody riparian species were recorded. The most abundant woody riparian species were lodgepole pine, quaking aspen, Woods' rose, arroyo willow, Lemmon's willow, Sierra gray willow, and American dogwood (refer to Figure TERR 1-7). Willows and dogwood were patchily distributed along the immediate banks of the stream corridor, underneath an overstory of lodgepole pine and quaking aspen.

South Rush Creek had a moderate cover of herbaceous/graminoid vegetation, with cover being higher in the wet meadow and declining in the upstream portions of South Rush Creek. Percent cover of herbaceous/graminoid vegetation in the plots varied from 4 to 138 percent cover, with an average cover of 56 percent across the plots. Species richness varied from three to eight species per plot, with an average of approximately five species across the plots. The most abundant graminoid species included panicled bulrush, bluejoint, blue wildrye, and Kentucky bluegrass. The most abundant herbaceous species included tarragon and field horsetail.

Substrates observed in the plots included boulder, cobble, gravel, silt, and sand.

6.4.4 Riparian Vegetation Processes Overview

Refer to Appendix O for a description of riparian processes in Sierra Nevada systems similar to Rush Creek.

6.5 RIPARIAN AND WETLAND COMMUNITIES IN THE POTENTIAL ENHANCEMENT AREA

Provided below is a description of the documentation of the riparian community and the aquatic resources delineation which were conducted within the potential enhancement area.

6.5.1 Documentation of the Riparian Community

The potential enhancement area encompasses 14.23 acres, of which 9.05 acres (approximately 64 percent) is covered with riparian vegetation. Four Manual of California Vegetation riparian alliances were mapped within the potential enhancement area, including the following alliances:

- *Pinus contorta* ssp. *murrayana* Forest Alliance (Lodgepole Pine Forest)

- *Populus tremuloides* Forest Alliance (Aspen Groves)
- *Populus tremuloides* Shrubland Alliance (Aspen Groves)
- *Salix boothii – Salix geyeriana – Salix lutea* Shrubland Alliance (Booth's Willow – Geyer's Willow – Yellow Willow Thickets_

Refer to Map TERR 1-8 for the location of these riparian alliances within the potential enhancement area.

Fifteen tree/shrub species were recorded within the riparian community in the potential enhancement area, including white fir (*Abies concolor*), American dogwood, juniper (*Juniperus* spp.), lodgepole pine, quaking aspen, black cottonwood (*Populus trichocarpa*), Woods' rose, and eight different willow species—narrowleaf willow, Geyer's willow, Goodding's willow, Pacific willow, arroyo willow, Lemmon's willow, Sierra gray willow, and Scouler's willow (*Salix scouleriana*).

Refer to Table TERR 1-12 for a summary of percent cover, by age class, for each species detected in the potential enhancement area.

The dominant species detected in the potential enhancement area include lodgepole pine, quaking aspen, Geyer's willow, and arroyo willow.

6.5.2 Aquatic Resources Delineation

Refer to the aquatic resources delineation report in Appendix A for the results of the aquatic resources delineation and a description of aquatic resources in the potential enhancement area.

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TABLES

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Table TERR 1-1. Project-affected Stream Segments, Reservoirs, and Selected Riparian Sampling Sites

Project-affected Stream Segment/Reservoir Name	Selected Riparian Sampling Sites Abbreviation (Approximate River Mile)	Date Sampled
Rush Creek		
Waugh Lake	**WL (RM 23.0)**	**9/5/2023 – 9/6/2023**
Rush Creek Below Rush Meadows Dam[1]	**Previous Riparian Studies: Rush Creek Below Rush Meadows Dam[1] (RM 21.65)**	**8/30/2022 – 9/1/2022[2]**
Gem Lake	—	—
Rush Creek Below Gem Dam	—	—
Agnew Lake	—	—
Rush Creek Below Agnew Dam	**RCBAD (RM 18.55)**	**9/10/2023**
Rush Creek Horsetail Falls	—	—
Rush Creek Above Silver Lake	**RCASL (RM 17.05)** **RCASLM (RM 17.55)**	**9/8/2023 – 9/9/2023**
Silver Lake	—	—
Rush Creek Below Silver Lake	**RCBSL (RM 15.2)**	**9/7/2023**
South Rush Creek		
South Rush Creek	**SRC (RM 0.15)**	**9/8/2023**

Notes:

Includes long-term baseline riparian monitoring sites that have historically been monitored consistent with Forest Service Final 4(e) Condition No. 7 – Monitoring (FERC 1997).

Three existing sites along this Project-affected stream segment were sampled by E Read and Associates, Inc. in 2022 (E Read and Associates, Inc. 2023).

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Table TERR 1-2. Special Status Plants Identified in the Study Area

Scientific Name	Common Name	Population ID	Area		Number of Individuals/Percent Cover		Vegetation Alliance
			Acres	Square Feet	Confirmed Whitebark Pines	Unknown Five-needle Pines	
Rush Meadows Dam Area							
Pinus albicaulis	*Whitebark pine*	PIAL 1	19.52	850,313	658	801	Lodgepole Pine, Subalpine Conifer
		PIAL 2	0.69	29,924	6	3	Subalpine Conifer
		PIAL 3	1.18	51,224	5	14	Subalpine Conifer
		PIAL 4	0.09	3,781	1	1	Subalpine Conifer
		PIAL 5	1.07	46,419	29	19	Lodgepole Pine, Subalpine Conifer
		PIAL 6	0.15	6,722	2	3	Alpine Grasses and Forbs
		PIAL 7	0.05	2,150	1	1	Willow (Shrub)
		PIAL 8	0.10	4,295	6	3	Subalpine Conifer
		PIAL 9	0.17	7,206	1	3	Willow (Shrub)
Pinus spp.	*Unknown five-needle pine*	U5NP 1	0.03	1,331	0	2	Subalpine Conifer
		U5NP 2	0.04	1,821	0	1	Barren
		U5NP 3	0.05	2,333	0	4	Subalpine Conifer
Rush Creek Below Rush Meadows Dam							
Pinus albicaulis	Whitebark pine	PIAL 10	0.11	4,666	12	9	Willow (Shrub)
		PIAL 11	0.03	1,317	2	5	Willow (Shrub)
		PIAL 12	1.89	82,219	20	180	Lodgepole Pine
		PIAL 13	0.20	8,802	3	5	Lodgepole Pine, Willow (Shrub)
		PIAL 14	0.01	402	1	0	Lodgepole Pine
		PIAL 15	0.21	9,296	4	3	Lodgepole Pine, Willow (Shrub)
		PIAL 16	0.04	1,877	2	0	Subalpine Conifer
		PIAL 17	0.20	8,724	1	8	Lodgepole Pine, Willow (Shrub)
		PIAL 18	0.35	15,175	13	12	Lodgepole Pine, Willow (Shrub)
		PIAL 19	0.02	884	2	1	Lodgepole Pine, Subalpine Conifer
		PIAL 20	0.04	1,525	1	3	Lodgepole Pine
		PIAL 21	0.33	14,272	6	7	Lodgepole Pine
		PIAL 22	0.14	5,924	3	2	Lodgepole Pine
		PIAL 23	0.02	893	1	0	Lodgepole Pine
		PIAL 24	1.09	47,497	6	15	Lodgepole Pine
		PIAL 25	0.02	808	1	2	Lodgepole Pine
		PIAL 26	0.19	8,161	10	40	Lodgepole Pine
		PIAL 27	0.64	28,078	12	45	Lodgepole Pine, Subalpine Conifer
Pinus spp.	Unknown five-needle pine	U5NP 4	0.01	566	0	3	Lodgepole Pine, Willow (Shrub)
		U5NP 5	0.05	2,342	0	3	Lodgepole Pine, Willow (Shrub)
		U5NP 6	0.004	179	0	1	Lodgepole Pine
		U5NP 7	0.01	376	0	2	Lodgepole Pine
		U5NP 8	0.03	1,054	0	3	Lodgepole Pine, Subalpine Conifer

Scientific Name	Common Name	Population ID	Area		Number of Individuals/Percent Cover		Vegetation Alliance
			Acres	Square Feet	Confirmed Whitebark Pines	Unknown Five-needle Pines	
Gem Dam Area							
Pinus albicaulis	Whitebark pine	PIAL 28	3.50	152,443	44	65	Lodgepole Pine, Subalpine Conifer, Alpine Mixed Scrub
		PIAL 29	2.17	94,313	5	7	Subalpine Conifer
		PIAL 30	7.13	310,555	132	216	Subalpine Conifer,
		PIAL 31	7.38	321,508	48	92	Lodgepole Pine, Subalpine Conifer, Low Sagebrush,
		PIAL 32	1.43	62,472	66	66	Subalpine Conifer
		PIAL 33	0.21	9,361	10	9	Subalpine Conifer
		PIAL 34	1.48	64,350	10	11	Subalpine Conifer
		PIAL 35	0.54	23,400	4	8	Low Sagebrush, Curlleaf Mountain Mahogany
		PIAL 36	1.32	57,345	54	56	Subalpine Conifer
		PIAL 37	1.04	45,130	9	18	Subalpine Conifer
Pinus spp.	Unknown five-needle pine	U5NP 9	0.54	23,535	0	11	Barren
		U5NP 10	0.22	9,616	0	2	Curlleaf Mountain Mahogany
Agnew Dam Area							
Pinus albicaulis	Whitebark pine	PIAL 38	0.86	37,277	3	19	Lodgepole Pine
Pinus spp.	Unknown five-needle pine	U5NP 11	0.81	35,179	0	14	Subalpine Conifer
Total Trees in Study Area							
Pinus albicaulis	Whitebark pine	–	55.57	2,420,709	1,194		–
Pinus spp.	Unknown five-needle pine	–	57.30	2,495,869	1,798		–

[1] Trees missing conclusive features for identification (i.e., mature bark and cones) were classified as unknown five-needle pines consistent with INF guidance.

Table TERR 1-3. Non-native Invasive Plant Species Identified in the Study Area

Common Name	Scientific Name	INF Priority Ranking1	Previous Records in Study Area?
Cheatgrass	*Bromus tectorum*	Group 3	Yes
Spotted knapweed	*Centaurea stoebe*	Group 1	No
Bull thistle	*Cirsium vulgare*	Group 3	No
White sweet clover	*Melilotus albus*	Group 3	No
Prostrate knotweed	*Polygonum aviculare*	Group 4	No
Curly dock	*Rumex crispus*	Group 4	No
Russian thistle (tumbleweed)	*Salsola tragus*	Group 3	No
Soapwort	*Saponaria officinalis*	Group 2	No
Red sandspurry	*Spergularia rubra*	Group 4	No
Common dandelion	*Taraxacum officinale*	Group 4	No
Yellow salsify	*Tragopogon dubius*	Group 4	No
White clover	*Trifolium repens*	Group 4	No
Common Mullein	*Verbascum thapsus*	Group 4	No

[1] INF priority rankings are defined as follows:
Group 1 (Eradicate): Annually treat and monitor the infestation with the goal of complete elimination of the species.
Group 2 (Control): Treat and monitor a portion of the infestations each year, focusing on reducing the acreage and percent cover over time.
Group 3 (Contain): Treat leading edge or new satellite infestations, or where concurrent with high-value resources.
Group 4 (Limited or No Treatment): Limited/No treatment: Limited to site-specific restoration projects or no treatment efforts at this time.

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Table TERR 1-4. Non-Native Invasive Plant Populations in the Study Area

Project Facility or Feature (Population ID)[1]	Scientific Name	Common Name	INF Priority Ranking	Infestation Level[2]	Survey Date	Area	
						Square Feet	Acres
Rush Meadows Dam Area							
Rush Meadows Dam	*Bromus tectorum*	Cheatgrass	3	Low	8/10/2023	1	<0.01
Gem Dam Area							
Gem Boat Dock	*Bromus tectorum*	Cheatgrass	3	Low	9/16/2023	746	0.02
Gem Lake 1	*Rumex crispus*	Curly dock	4	Low	9/15/2023	108,967	2.50
Gem Lake 2	*Rumex crispus*	Curly dock	4	Low	9/15/2023	553,635	12.71
Gem Lake 3	*Rumex crispus*	Curly dock	4	Low	9/15/2023	35,285	0.81
Gem Dam to Agnew Junction Penstock 1	*Bromus tectorum*	Cheatgrass	3	Low	7/20/2023	23,705	0.54
Gem Dam to Agnew Junction Penstock 1	*Verbascum thapsus*	Common Mullein	4	Low	7/20/2023	12	<0.01
Gem Dam to Agnew Junction Penstock 1	*Bromus tectorum*	Cheatgrass	3	Low	7/20/2023	18,049	0.41
Gem Dam to Agnew Junction Penstock 1	*Bromus tectorum*	Cheatgrass	3	Low	7/20/2023	17,499	0.40
Gem Dam to Agnew Junction Penstock 1	*Bromus tectorum*	Cheatgrass	3	Low	7/20/2023	24,635	0.57
Gem Dam to Agnew Junction Penstock 1	*Bromus tectorum*	Cheatgrass	3	Low	7/20/2023	8,551	0.20
Agnew Dam Area							
Agnew Lake 1	*Cirsium vulgare*	Bull thistle	3	Low	9/10/2023	303,474	6.97
	Rumex crispus	Curly dock	4	Low	9/10/2023		
	Verbascum thapsus	Common mullein	4	Moderate	9/10/2023		
Agnew Lake 2	*Rumex crispus*	Curly dock	4	Low	9/10/2023	107,676	2.47
	Bromus tectorum	Cheatgrass	3	Low	9/10/2023		
Agnew Lake 3	*Rumex crispus*	Curly dock	4	Low	9/10/2023	34,488	0.79
	Verbascum thapsus	Common mullein	4	Moderate	9/10/2023		
Agnew Lake 4	*Bromus tectorum*	Cheatgrass	3	Moderate	9/10/2023	33,370	0.77
Agnew Lake 5	*Verbascum thapsus*	Common mullein	4	Low	9/10/2023	44,530	1.02
	Bromus tectorum	Cheatgrass	3	Low	9/10/2023		
Agnew Dam	*Verbascum thapsus*	Common mullein	4	Moderate	7/20/2023; 9/10/2023	181,219	4.16
	Rumex crispus	Curly dock	4	Low	9/10/2023		
	Bromus tectorum	Cheatgrass	3	Low	9/10/2023		
Agnew Tram 1	*Bromus tectorum*	Cheatgrass	3	Moderate	7/19/2023; 7/20/2023; 9/9/2023; 9/10/2023	108,654	2.49
Agnew Tram 2	*Bromus tectorum*	Cheatgrass	3	Low	9/9/2023	854	0.02
Agnew Tram 3	*Bromus tectorum*	Cheatgrass	3	Low	7/19/2023	10,567	0.24
	Taraxacum officinale	Common dandelion	4	Moderate	7/19/2023; 9/9/2023		
	Verbascum thapsus	Common Mullein	4	Moderate	7/19/2023; 9/9/2023		
Agnew Tram 4	*Bromus tectorum*	Cheatgrass	3	Low	7/19/2023	21,846	0.50

Project Facility or Feature (Population ID)[1]	Scientific Name	Common Name	INF Priority Ranking	Infestation Level[2]	Survey Date	Area	
						Square Feet	Acres
Agnew Tram 5	*Bromus tectorum*	Cheatgrass	3	Low	7/19/2023	28,733	0.66
Agnew Tram 6	*Bromus tectorum*	Cheatgrass	3	Moderate	7/18/2023; 9/9/2023	10,777	0.25
	Cirsium vulgare	Bull thistle	3	Low	7/18/2023		
	Melilotus albus	White sweetclover	3	Moderate	9/9/2023		
	Verbascum thapsus	Common mullein	4	Low	9/9/2023		
Agnew Tram 7	*Bromus tectorum*	Cheatgrass	3	High	9/8/2023	4	<0.01
Agnew Tram 8[3]	Unknown Melilotus spp	No species ID	3	Low	9/9/2023	1	<0.01
Agnew Tram 9	*Bromus tectorum*	Cheatgrass	3	Low	9/9/2023	4	<0.01
Powerline to Agnew Dam 1	*Bromus tectorum*	Cheatgrass	3	Low	9/9/2023	16	<0.01
Powerline to Agnew Dam 2	*Bromus tectorum*	Cheatgrass	3	Low	7/19/2023	36,750	0.84
Powerline to Agnew Dam 3	*Bromus tectorum*	Cheatgrass	3	Moderate	9/8/2023	561	0.01
Powerline to Agnew Dam 4	*Bromus tectorum*	Cheatgrass	3	Low	7/18/2023	6,290	0.14
Rush Creek Powerhouse Area							
Rush Creek Powerhouse 1	Bromus tectorum	Cheatgrass	3	Moderate	9/9/2023	12266	0.28
Rush Creek Powerhouse 2	Tragopogon dubius	Yellow salsify	4	Low	7/18/2023	10	<0.01
Rush Creek Powerhouse 3	Bromus tectorum	Cheatgrass	3	Low	9/8/2023	1	<0.01
Rush Creek Powerhouse 4	Bromus tectorum	Cheatgrass	3	Moderate	9/8/2023	10	0.16
Rush Creek Powerhouse 5	Bromus tectorum	Cheatgrass	3	Low	7/18/2023	99	<0.01
Rush Creek Powerhouse 6	Bromus tectorum	Cheatgrass	3	Moderate	9/8/2023	4	<0.01
Rush Creek Powerhouse 7	Bromus tectorum	Cheatgrass	3	Low	7/18/2023	30	0.16
Rush Creek Powerhouse 8	Bromus tectorum	Cheatgrass	3	Low	9/8/2023	4	<0.01
Rush Creek Powerhouse 9	Bromus tectorum	Cheatgrass	3	Low	9/9/2023	4	<0.01
Rush Creek Powerhouse 10	Bromus tectorum	Cheatgrass	3	Low	9/9/2023	9	<0.01
Rush Creek Powerhouse 11	Bromus tectorum	Cheatgrass	3	Low	9/8/2023	10	<0.01
Rush Creek Powerhouse 12	Bromus tectorum	Cheatgrass	3	Low	9/9/2023	7064	0.16
Switchyard 1	*Bromus tectorum*	Cheatgrass	3	Low	7/18/2023	601	0.01
	Spergularia rubra	Red sandspurry	4	Low	7/18/2023		
	Trifolium repens	White clover	4	Low	7/18/2023		
Switchyard 2	*Bromus tectorum*	Cheatgrass	3	Low	7/18/2023	14,206	0.33
	Melilotus albus	White sweetclover	3	Low	9/8/2023		
	Verbascum thapsus	Common mullein	4	Low	9/8/2023		
Garage and Pump House	*Bromus tectorum*	Cheatgrass	3	Low	9/7/2023	11,685	0.27
	Melilotus albus	White sweetclover	3	Low	7/18/2023		
	Rumex crispus	Curly dock	4	Low	7/17/2023		
	Taraxacum officinale	Common dandelion	4	Low	7/18/2023		
	Tragopogon dubius	Yellow salsify	4	Low	9/7/2023		
	Verbascum thapsus	Common mullein	4	Low	9/7/2023		
	Trifolium repens	White clover	4	Low	7/17/2023		
Warehouse and Dock	*Bromus tectorum*	Cheatgrass	3	Low	7/18/2023	6,322	0.15

Project Facility or Feature (Population ID)[1]	Scientific Name	Common Name	INF Priority Ranking	Infestation Level[2]	Survey Date	Area	
						Square Feet	Acres
Machine Shop	*Bromus tectorum*	Cheatgrass	3	Low	9/7/2023	3,292	0.08
	Melilotus albus	White sweetclover	3	Moderate	9/7/2023; 9/8/2023		
	Taraxacum officinale	Common dandelion	4	Moderate	7/17/2023; 9/8/2023		
	Tragopogon dubius	Yellow salsify	4	Moderate	9/7/2023		
	Verbascum thapsus	Common mullein	4	Moderate	9/7/2023; 9/8/2023		
HWY 158	*Taraxacum officinale*	Common dandelion	4	Low	7/17/2023	17,532	0.40
	Tragopogon dubius	Yellow salsify	4	Low	7/17/2023		
	Verbascum thapsus	Common mullein	4	Low	7/17/2023		
Cottage and Woodshed	*Bromus tectorum*	Cheatgrass	3	Low	7/18/2023; 9/8/2023	27,226	0.63
	Cirsium vulgare	Bull thistle	3	Low			
	Saponaria officinalis	Soapwort	2	Moderate	9/8/2023		
	Taraxacum officinale	Common dandelion	4	Low	9/8/2023		
	Tragopogon dubius	Yellow salsify	4	Low	7/18/2023		
	Trifolium repens	White clover	4	Low	7/18/2023		
	Verbascum thapsus	Common mullein	4	Low	7/18/2023		
Access Road	*Bromus tectorum*	Cheatgrass	3	Low	7/18/2023	5,786	0.13
	Melilotus albus	White sweetclover	3	Low	7/18/2023		
	Taraxacum officinale	Common dandelion	4	Low	7/18/2023		
	Verbascum thapsus	Common mullein	4	Low	7/18/2023		
	Trifolium repens	White clover	4	Low	7/18/2023		
Bridge	*Taraxacum officinale*	Common dandelion	4	Low	9/8/2023	22,914	0.53
	Verbascum thapsus	Common mullein	4	Low	9/8/2023		
Enhancement Area	*Bromus tectorum*	Cheatgrass	3	Low	7/17/2023	6,982	0.16
	Cirsium vulgare	Bull thistle	3	Low	9/7/2023		
	Polygonum aviculare	Prostrate knotweed	4	Moderate	9/7/2023		
	Salsola tragus	Russian thistle	3	High	9/7/2023		
	Spergularia rubra	Red sandspurry	4	Moderate	9/7/2023		
	Tragopogon dubius	Yellow salsify	4	Low	7/17/2023		
	Verbascum thapsus	Common mullein	4	Low	9/7/2023		
South Rush Creek Cottage	*Bromus tectorum*	Cheatgrass	3	Moderate	9/8/2023	135,842	3.12
	Cirsium vulgare	Bull thistle	3	Low	9/7/2023		
	Centaurea stoebe	Spotted knapweed	1	Low	9/9/2023		
	Rumex crispus	Curly dock	4	Low	9/7/2023		
	Polygonum aviculare	Prostrate knotweed	4	Low	9/8/2023		
	Tragopogon dubius	Yellow salsify	4	Moderate	9/8/2023		
	Verbascum thapsus	Common mullein	4	Moderate	9/7/2023; 9/8/2023; 9/9/2023		

[1] Refer to Map TERR 1-4a-q for the location of populations.

[2] **Inyo NF Priority Ranking (Treatment Strategies)**
1 Eradicate: Annually treat and monitor the infestation with the goal of complete elimination of the species.
2 Control: Treat and monitor a portion of the infestations each year, focusing on reducing the acreage and percent cover over time.
3 Contain: Treat leading edge or new satellite infestations, or where concurrent with high-value resources.
4 Limited/No Treatment: Limited to site-specific restoration projects or no treatment efforts at this time.

[3] Plants were past bloom period and missing conclusive features for species identification. White sweetclover (Melilotus albus) found in vicinity at Agnew Tram 9.

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Table TERR 1-5. Live Tree Core Sampling Information

Tree Species (Abbreviation)	Live Tree Core Reservoir Location	Sampling Date	Sampling Location		Diameter at Breast Height (DBH) of Live Tree (inches)	Unique Wood Characteristics Observed
			Latitude	Longitude		
Pinus contorta ssp. murreyana lodgepole pine (PICOM)	Waugh Lake	9/26/2023	37.750223	-119.202464	32.1	Resin ducts present, thinner latewood, tree trunks grow straight
Tsuga mertensiana mountain hemlock (TSME)	Waugh Lake	9/26/2023	37.74891	-119.182745	30.7	Aromatic when sanded, thinner latewood, unique wood texture and red coloration
Pinus jeffreyi Jeffrey pine (PIJE)	Gem Lake	9/27/2023	37.753778	-119.145498	53.1	Wide rings indicating a fast-growing species, wider latewood
Juniperus occidentalis western juniper (JUOC)	Gem Lake	9/27/2023	37.753863	-119.145525	45.0	Aromatic when sanded, wider latewood, fibrous wood texture and purple coloration, twisted trunks,
Pinus monticola western white pine (PIMO)	Agnew Lake	9/29/2023	37.756031	-119.133047	23.2	Similar to *Pinus contorta* ssp. *murreyana,* but has wide resin ducts present in the wood

Table TERR 1-6. Species Determinations for Stump Cross-Sections Collected within the Historical Inundation Zone of Project Reservoirs

Stump Sampling ID	Collection Date	Stump Sampling Location		Stump Diameter at Ground Level (inches)	Species Determination[1]
		Latitude	Longitude		
Waugh Lake					
WL-ST-001	9/25/2023	37.754224	-119.190777	21.75	*Pinus* spp. unknown pine species
WL-ST-002	9/25/2023	37.754091	-119.191111	32.5	*Pinus contorta* ssp. *murrayana* lodgepole pine
WL-ST-003	9/25/2023	37.753863	-119.191243	26.6	*Pinus contorta* ssp. *murrayana* lodgepole pine
WL-ST-004	9/25/2023	37.75375	-119.191688	18.7	*Tsuga mertensiana* mountain hemlock
WL-ST-005	9/25/2023	37.753326	-119.191707	17	*Pinus contorta* ssp. *murrayana* lodgepole pine
WL-ST-006	9/26/2023	37.751724	-119.197948	30.9	*Pinus* spp. unknown pine species
WL-ST-007	9/26/2023	37.751595	-119.197921	37.2	*Pinus contorta* ssp. *murrayana* lodgepole pine
WL-ST-008	9/26/2023	37.750812	-119.198805	38.8	*Pinus* spp. unknown pine species
WL-ST-009	9/26/2023	37.750468	-119.200135	31.1	*Pinus contorta* ssp. *murrayana* lodgepole pine
WL-ST-010	9/26/2023	37.749534	-119.201847	15.3	*Pinus* spp. unknown pine species
WL-ST-011	9/26/2023	37.749421	-119.202401	33.3	*Pinus* spp. unknown pine species
WL-ST-012	9/26/2023	37.751920	-119.185538	40.5	*Pinus* spp. unknown pine species
WL-ST-013	9/26/2023	37.752215	-119.185262	21.1	*Pinus contorta* ssp. *murrayana* lodgepole pine
WL-ST-014	9/26/2023	37.751353	-119.183238	22.7	*Pinus contorta* ssp. *murrayana* lodgepole pine

Stump Sampling ID	Collection Date	Stump Sampling Location		Stump Diameter at Ground Level (inches)	Species Determination[1]
		Latitude	Longitude		
WL-ST-015	9/26/2023	37.751233	-119.182993	17.6	*Pinus contorta* ssp. *murrayana* lodgepole pine
WL-ST-016	9/26/2023	37.751233	-119.182993	17.6	*Pinus contorta* ssp. *murrayana* lodgepole pine
WL-ST-017	9/26/2023	37.751214	-119.182998	21.1	*Pinus* spp. unknown pine species
WL-ST-018	9/26/2023	37.750231	-119.183024	35.3	*Pinus contorta* ssp. *murrayana* lodgepole pine
Gem Lake					
GLT-ST-001	9/27/2023	37.75214	-119.149856	34.2	*Tsuga mertensiana* mountain hemlock
GLT-ST-002	9/27/2023	37.750917	-119.147678	36.7	*Juniperus occidentalis* western juniper
GLT-ST-003	9/27/2023	37.75317	-119.145762	22.5	*Tsuga mertensiana* mountain hemlock
GLT-ST-004	9/27/2023	37.752222	-119.145595	38.9	*Juniperus occidentalis* western juniper
GLT-ST-005	9/27/2023	37.75777	-119.157534	25.4	*Pinus jeffreyi* Jeffrey pine
GLT-ST-006	9/27/2023	37.758451	-119.158164	25.3	*Juniperus occidentalis* western juniper
GLT-ST-007	9/27/2023	37.757600	-119.157555	17.2	*Juniperus occidentalis* western juniper
GLT-ST-008	9/28/2023	37.755663	-119.159013	18.3	*Juniperus occidentalis* western juniper
GLT-ST-009	9/28/2023	37.755530	-119.158850	28.7	*Pinus* spp. unknown pine species
GLT-ST-010	9/28/2023	37.755838	-119.159209	13	*Juniperus occidentalis* western juniper
GLT-ST-011	9/28/2023	37.755633	-119.159454	42.6	*Juniperus occidentalis* western juniper

Stump Sampling ID	Collection Date	Stump Sampling Location		Stump Diameter at Ground Level (inches)	Species Determination[1]
		Latitude	Longitude		
GLT-ST-012	9/28/2023	37.749873	-119.156195	27.5	*Juniperus occidentalis* western juniper
GLT-ST-013	9/28/2023	37.749804	-119.156220	29.2	*Pinus contorta* ssp. *murrayana* lodgepole pine
GLT-ST-014	9/28/2023	37.750042	-119.156322	25.1	*Juniperus occidentalis* western juniper
GLT-ST-015	9/28/2023	37.749983	-119.156903	32.3	*Juniperus occidentalis* western juniper
Agnew Lake					
ALT-ST-001	9/29/2023	37.757934	-119.132233	21.1	*Pinus jeffreyi* Jeffrey pine
ALT-ST-002	9/29/2023	37.757948	-119.132212	15.7	*Pinus jeffreyi* Jeffrey pine
ALT-ST-003	9/29/2023	37.757658	-119.132542	16	*Pinus monticola* western white pine
ALT-ST-004	9/29/2023	37.757561	-119.132495	14.2	*Pinus jeffreyi* Jeffrey pine
ALT-ST-005	9/29/2023	37.757595	-119.132698	13.3	*Pinus jeffreyi* Jeffrey pine
ALT-ST-006	9/29/2023	37.756756	-119.134367	24.4	*Pinus jeffreyi* Jeffrey pine
ALT-ST-007	9/29/2023	37.756417	-119.134499	24.8	*Pinus jeffreyi* Jeffrey pine
ALT-ST-008	9/29/2023	37.755358	-119.135886	21.8	*Juniperus occidentalis* western juniper
ALT-ST-009	9/29/2023	37.755351	-119.135869	37.2	*Pinus* spp. unknown pine species
ALT-ST-010	9/29/2023	37.754974	-119.136313	28.8	*Juniperus occidentalis* western juniper
ALT-ST-011	9/29/2023	37.756442	-119.133472	30.3	*Pinus monticola* western white pine

Stump Sampling ID	Collection Date	Stump Sampling Location		Stump Diameter at Ground Level (inches)	Species Determination[1]
		Latitude	Longitude		
ALT-ST-012	9/29/2023	37.756504	-119.133495	10.3	*Pinus jeffreyi* Jeffrey pine
ALT-ST-013	9/29/2023	37.756159	-119.133275	30.2	*Juniperus occidentalis* western juniper
ALT-ST-014	9/29/2023	37.756581	-119.132416	25.4	*Pinus jeffreyi* Jeffrey pine
ALT-ST-015	9/29/2023	37.757395	-119.132156	13	*Pinus* spp. unknown pine species
ALT-ST-016	9/29/2023	37.757704	-119.132033	23.4	*Pinus monticola* western white pine

[1] Some stump cross-sections had intermediary characteristics between different pine species collected for analysis. Unknown pines (PISPP) were similar to *Pinus contorta* ssp. *murrayana,* but had wider latewood, more resinous areas, and often had multiple stems near the main sampled stump base. The PISPP stump cross-sections did not match the characteristics of lodgepole pine, but were identified as matching general *Pinus* characteristics by the dendrochronologist. Because whitebark pine is a listed species that could not be sampled as part of the study, but are present in the forest community surrounding Waugh Lake, it is unknown whether stump samples identified as PISPP are whitebark pine or another pine species.

Table TERR 1-7. Total Species Richness of Graminoids, Herbs, Shrubs, and Trees Within the Historic Inundation Zones of Project Reservoirs.

Project Reservoir	Species Richness (Total Number of Species)				Total Number of All Species
	Graminoids	Herbs	Shrubs	Trees	
Waugh Lake	41	42	10	4	**97**
Gem Lake	25	36	16	4	**81**
Agnew Lake	27	35	18	4	**84**

Table TERR 1-8. Diameter at Breast Height of Trees Across Botanical Sampling Plots Within the Historic Inundation Zones of Project Reservoirs

Project Reservoir	Diameter at Breast Height (DBH) Range of Trees (inches)	
	DBH Range in Plots in Historic Inundation Zone (Average DBH)	DBH Range in Plots Above OHWM (Average DBH)
Waugh Lake	Seedlings to 1 (Seedling)	Seedlings to 30 (6.2)
Gem Lake	Seedlings to 1 (Seedling)	Seedling to 18 (5.5)
Agnew Lake	Seedlings (Seedling)	Seedlings to 8 (6.9)

Table TERR 1-9. Summary of Riparian Data Collected at Selected Riparian Sampling Sites

Sampling Location	Transect Number	Plot Number	Woody Riparian Trees/Shrubs			Herbaceous/Graminoid Plants		Substrates Present
			Total Percent Cover	Species Richness	Age Classes Present[1]	Total Percent Cover	Species Richness	
WAUGH LAKE SAMPLING SITE								
Waugh Lake	R1	WL1-001	0	0	—	1	2	Boulder, Cobble, Gravel, Sand, Silt
Waugh Lake	R1	WL1-002	0	0	—	1	3	Bedrock, Boulder, Cobble, Gravel, Sand, Silt
Transect 1 Average or Total Features Present			**0**	**0**	**—**	**1**	**2.5**	**Bedrock, Boulder, Cobble, Gravel, Sand, Silt**
Waugh Lake	R2	WL2-001	0	0	—	6	5	Bedrock, Boulder, Cobble, Gravel, Sand, Silt
Waugh Lake	R2	WL2-002	1	2	Y	10	4	Bedrock, Boulder, Cobble, Gravel, Sand, Silt
Transect 2 Average or Total Features Present			**0.5**	**1**	**Y**	**8**	**4.5**	**Bedrock, Boulder, Cobble, Gravel, Sand, Silt**
Waugh Lake	R3	WL3-001	0	0	—	7	2	Bedrock, Boulder, Cobble, Gravel, Sand, Silt
Waugh Lake	R3	WL3-002	0	0	—	36	6	Cobble, Gravel, Sand, Silt
Transect 3 Average or Total Features Present			**0**	**0**	**—**	**21.5**	**4**	**Bedrock, Boulder, Cobble, Gravel, Sand, Silt**
Waugh Lake	R4	WL4-001	0	0	—	17	6	Cobble, Gravel, Sand, Silt
Waugh Lake	R4	WL4-002	11	2	Y	73	10	Boulder, Cobble, Gravel, Sand, Silt
Waugh Lake	R4	WL4-003	1	1	Y	61	5	Cobble, Gravel, Silt
Transect 4 Average or Total Features Present			**4**	**1**	**Y**	**50.3**	**7**	**Boulder, Cobble, Gravel, Sand, Silt**
Waugh Lake Average or Total Features Present			**1.4**	**0.6**	**Y**	**23.6**	**4.8**	**Bedrock, Boulder, Cobble, Gravel, Sand, Silt**
RUSH CREEK BELOW RUSH MEADOWS DAM SAMPLING SITE[2]								
Rush Creek below Rush Meadows Dam Site 1	**Average Across 3 Transects**	**NA**	24.9 (Riparian Shrub), 58.2 (Upland Conifers), 4.6 (Upland Shrubs)	2 (Riparian Shrub), 3 (Upland Conifer)	No recruitment of young seedlings observed	17.7 (Riparian), 9.8 (Upland)	20 (Riparian), 22 (Upland)	Gravel, Sand, Silt
Rush Creek Below Rush Meadows Dam Site 2	**Average Across 3 Transects**	**NA**	24.9 (Riparian Shrub), 37.3 (Upland Conifers), 10.3 (Upland Shrubs)	4 (Riparian Shrub), 1 (Upland Conifer)	No recruitment of young seedlings observed.	5.2 (Riparian), 1.1 (Upland)	3 (Riparian), 5 (Upland)	Sand, Silt
RUSH CREEK BELOW AGNEW DAM SAMPLING SITE								
Rush Creek Below Agnew Dam	R1	RCBAD1-001	62	4	Y, M	70	5	Bedrock, Boulder, Cobble, Gravel, Sand, Silt
Rush Creek Below Agnew Dam	R1	RCBAD1-002	1	1	Y	18	5	Bedrock, Boulder, Cobble, Sand, Silt
Transect 1 Average or Total Features Present			**31.5**	**2.5**	**Y, M**	**44**	**5**	**Bedrock, Boulder, Cobble, Gravel, Sand, Silt**
Rush Creek Below Agnew Dam	R2	RCBAD2-001	96	4	Y, M, O	56	8	Cobble, Gravel, Sand, Silt
Rush Creek Below Agnew Dam	R2	RCBAD2-002	140	4	Y, M, O	1	1	Cobble, Gravel, Sand, Silt
Rush Creek Below Agnew Dam	R2	RCBAD2-003	113	6	Y, M	6	3	Bedrock, Boulder, Sand, Silt

Sampling Location	Transect Number	Plot Number	Woody Riparian Trees/Shrubs			Herbaceous/Graminoid Plants		Substrates Present
			Total Percent Cover	Species Richness	Age Classes Present[1]	Total Percent Cover	Species Richness	
Transect 2 Average or Total Features Present			**116.3**	**4.7**	**Y, M, O**	**21**	**4**	**Bedrock, Boulder, Cobble, Gravel, Sand, Silt**
Rush Creek Below Agnew Dam	R3	RCBAD3-001	50	2	M	7	5	Bedrock, Boulder, Cobble, Silt
Rush Creek Below Agnew Dam	R3	RCBAD3-002	92	4	Y, M, O	102	9	Cobble, Gravel, Sand, Silt
Transect 3 Average or Total Features Present			**71**	**3**	**Y, M, O**	**54.5**	**7**	**Bedrock, Boulder, Cobble, Gravel, Sand, Silt**
Rush Creek Below Agnew Dam Average or Total Features Present			**79.1**	**3.6**	**Y, M, O**	**37.1**	**5.1**	**Bedrock, Boulder, Cobble, Gravel, Sand, Silt**
RUSH CREEK ABOVE SILVER LAKE (RM 17.55) SAMPLING SITE								
Rush Creek Above Silver Lake (RM 17.05)	R1	RCASL1-001	93	2	Y, M, O	100	2	Sand, Silt
Rush Creek Above Silver Lake (RM 17.05)	R1	RCASL1-002	100	2	Y, O	75	3	Sand, Silt
Transect 1 Average or Total Features Present			**96.5**	**2**	**Y, M, O**	**87.5**	**2.5**	**Sand, Silt**
Rush Creek Above Silver Lake (RM 17.05)	R2	RCASL2-001	113	3	Y, M, O	80	1	Gravel, Sand, Silt
Rush Creek Above Silver Lake (RM 17.05)	R2	RCASL2-002	100	2	Y, M, O	101	3	Cobble, Gravel, Sand, Silt
Transect 2 Average or Total Features Present			**106.5**	**2.5**	**Y, M, O**	**90.5**	**2**	**Cobble, Gravel, Sand, Silt**
Rush Creek Above Silver Lake (RM 17.05)	R3	RCASL3-001	116	5	Y, M	86	3	Cobble, Gravel, Sand, Silt
Rush Creek Above Silver Lake (RM 17.05)	R3	RCASL3-002	70	3	Y, M, O	71	2	Boulder, Cobble, Gravel, Sand, Silt
Rush Creek Above Silver Lake (RM 17.05)	R3	RCASL3-003	138	4	M, O	3	2	Cobble, Gravel, Sand, Silt
Transect 3 Average or Total Features Present			**108**	**4**	**Y, M, O**	**53.3**	**2.3**	**Boulder, Cobble, Gravel, Sand, Silt**
Rush Creek Above Silver Lake (RM 17.05) Average or Total Features Present			**104.3**	**3**	**Y, M, O**	**73.7**	**2.3**	**Boulder, Cobble, Gravel, Sand, Silt**
RUSH CREEK ABOVE SILVER LAKE (RM 17.05) SAMPLING SITE								
Rush Creek Above Silver Lake (RM 17.55)	R1	RCASLM1-001	0	0	—	106	3	Silt
Rush Creek Above Silver Lake (RM 17.55)	R1	RCASLM1-002	81	3	Y, O	29	4	Silt
Rush Creek Above Silver Lake (RM 17.55)	R1	RCASLM1-003	118	4	Y, M, O	30	2	Silt
Transect 1 Average or Total Features Present			**66.3**	**2.3**	**Y, M, O**	**55**	**3**	**Silt**
Rush Creek Above Silver Lake (RM 17.55)	R2	RCASLM2-001	0	0	—	120	3	Silt
Rush Creek Above Silver Lake (RM 17.55)	R2	RCASLM2-002	71	3	Y, M, O	28	3	Gravel, Sand, Silt
Rush Creek Above Silver Lake (RM 17.55)	R2	RCASLM2-003	0	0	—	110	2	Silt
Rush Creek Above Silver Lake (RM 17.55)	R2	RCASLM2-004	100	2	M, O	40	2	Sand, Silt

Sampling Location	Transect Number	Plot Number	Woody Riparian Trees/Shrubs			Herbaceous/Graminoid Plants		Substrates Present
			Total Percent Cover	Species Richness	Age Classes Present[1]	Total Percent Cover	Species Richness	
Transect 2 Average or Total Features Present			**42.8**	**1.25**	**Y, M, O**	**74.5**	**2.5**	**Gravel, Sand, Silt**
Rush Creek Above Silver Lake (RM 17.55)	R3	RCASLM3-001	45	1	O	94	6	Silt
Rush Creek Above Silver Lake (RM 17.55)	R3	RCASLM3-002	0	0	—	122	7	Silt
Rush Creek Above Silver Lake (RM 17.55)	R3	RCASLM3-003	101	2	Y, M, O	135	5	Silt
Rush Creek Above Silver Lake (RM 17.55)	R3	RCASLM3-004	41	3	Y, M, O	111	7	Silt
Transect 3 Average or Total Features Present			**46.8**	**1.5**	**Y, M, O**	**115.5**	**7.8**	**Silt**
Rush Creek Above Silver Lake (RM 17.55) Average or Total Features Present			**50.6**	**1.6**	**Y, M, O**	**75**	**4**	**Gravel, Sand, Silt**
RUSH CREEK BELOW SILVER LAKE SAMPLING SITE								
Rush Creek Below Silver Lake	R1	RCBSL1-001	132	5	Y, M, O	68	5	Boulder, Sand, Silt
Rush Creek Below Silver Lake	R1	RCBSL1-002	130	3	Y, O	66	6	Cobble, Gravel, Sand, Silt
Rush Creek Below Silver Lake	R1	RCBSL1-003	27	3	Y, M	76	7	Cobble, Gravel, Sand, Silt
Transect 1 Average or Total Features Present			**96.3**	**3.7**	**Y, M, O**	**70**	**6**	**Boulder, Cobble, Gravel, Sand, Silt**
Rush Creek Below Silver Lake	R2	RCBSL2-001	142	3	Y, M, O	155	5	Gravel, Sand, Silt
Rush Creek Below Silver Lake	R2	RCBSL2-002	80	2	Y, O	22	2	Silt
Rush Creek Below Silver Lake	R2	RCBSL2-003	80	2	M, O	97	4	Silt
Transect 2 Average or Total Features Present			**100.7**	**2.3**	**Y, M, O**	**91.3**	**3.7**	**Gravel, Sand, Silt**
Rush Creek Below Silver Lake	R3	RCBSL3-001	100	2	Y, M, O	113	4	Sand, Silt
Rush Creek Below Silver Lake	R3	RCBSL3-002	80	2	Y, O	155	4	Sand, Silt
Rush Creek Below Silver Lake	R3	RCBSL3-003	100	1	O	0	0	Silt
Rush Creek Below Silver Lake	R3	RCBSL3-004	96	2	Y, M, O	47	4	Cobble, Gravel, Sand, Silt
Transect 3 Average or Total Features Present			**94**	**1.8**	**Y, M, O**	**78.8**	**3**	**Cobble, Gravel, Sand, Silt**
Rush Creek Below Silver Lake Average or Total Features Present			**96.7**	**2.5**	**Y, M, O**	**79.9**	**4.1**	**Boulder, Cobble, Gravel, Sand, Silt**
SOUTH RUSH CREEK SAMPLING SITE								
South Rush Creek	R1	SRC1-001	70	1	O	110	4	Sand, Silt
South Rush Creek	R1	SRC1-002	54	4	Y, M	96	7	Boulder, Sand, Silt
South Rush Creek	R1	SRC1-003	80	3	Y, O	138	8	Sand, Silt
Transect 1 Average or Total Features Present			**68**	**2.7**	**Y, M, O**	**114.7**	**6.3**	**Boulder, Sand, Silt**
South Rush Creek	R2	SRC2-001	95	5	Y, O	15	3	Boulder, Cobble, Gravel, Sand, Silt
South Rush Creek	R2	SRC2-002	145	4	Y, M, O	4	4	Boulder, Cobble, Silt

Sampling Location	Transect Number	Plot Number	Woody Riparian Trees/Shrubs			Herbaceous/Graminoid Plants		Substrates Present
			Total Percent Cover	Species Richness	Age Classes Present[1]	Total Percent Cover	Species Richness	
Transect 2 Average or Total Features Present			**120**	**4.5**	**Y, M, O**	**9.5**	**3.5**	**Boulder, Cobble, Gravel, Sand, Silt**
South Rush Creek	R3	SRC3-001	41	6	Y, M, O	14	3	Boulder, Cobble, Gravel, Sand, Silt
South Rush Creek	R3	SRC3-002	29	6	Y, M	15	5	Boulder, Cobble, Gravel, Sand, Silt
Transect 3 Average or Total Features Present			**35**	**6**	**Y, M, O**	**14.5**	**4**	**Boulder, Cobble, Gravel, Sand, Silt**
South Rush Creek Average or Total Features Present			**73.4**	**4.1**	**Y, M, O**	**56**	**4.9**	**Boulder, Cobble, Gravel, Sand, Silt**

[1] Age class structure was determined based on categories or shrub stem densities per individual and tree diameters, as follows:
Young (Y): Shrubs with less than 10 stems per individual or trees with diameters (dbh) less than 3 inches;
Medium-aged (M): Shrubs with between 10 and 60 stems per individual or trees with dbhs between 3 and 9 inches; and
Old/Mature (O): Shrubs with more than 60 stems per individual or trees with dbhs greater than 9 inches.

[2] Data at this sampling reach was collected using methods that were established by SCE as part of the Forest Service Final 4(3) Condition No. 7 – Monitoring under the existing license (FERC 1997), which requires long-term monitoring of riparian vegetation in the reach of Rush Creek between Rush Meadows Dam and Gem Lake. Methods at the long-term riparian monitoring site differ slightly from the methods described in the TERR 2 – TSP, and data is averaged by site rather than reported for each transect.

Table TERR 1-10. Dominant Woody Riparian Tree and Shrub Species Observed at Selected Riparian Sampling Sites

Plant Species			Species Observed at Riparian Sampling Sites						
Scientific Name	**Common Name**	**NWI Status**	**Waugh Lake**	**Rush Creek Below Rush Meadows Dam[1]**	**Rush Creek Below Agnew Dam**	**Rush Creek Above Silver Lake (RM 17.55)**	**Rush Creek Above Silver Lake (RM 17.05)**	**Rush Creek Below Silver Lake**	**South Rush Creek**
Abies concolor	white fir	NI						X	X
Cassiope mertensiana	white heather	FACU		X					
Cornus sericea	American dogwood	NI			X	X			X
Lonicera involucrata var. *involucrata*	twinberry	FAC		X					
Phyllodoce breweri	mountain heather	FAC		X					
Pinus contorta ssp. murrayana	lodgepole pine	FAC	X	X		X	X	X	X
Populus tremuloides	quaking aspen	FACU			X	X		X	X
Rhododendron columbianum	Labrador tea	OBL		X	X				
Rhododendron occidentale	western azalea	FAC							X
Ribes cereum	wax currant	NI						X	
Ribes montigenum	mountain gooseberry	NI		X					
Rosa woodsii	Woods' rose	FACU				X		X	X
Salix eastwoodiae	mountain willow	FACW		X					
Salix exigua	sandbar willow	FACW			X			X	
Salix geyeriana	Geyer's willow	FACW			X	X	X		
Salix gooddingii	Goodding's willow	FACW			X				
Salix lasiandra	Pacific willow	FACW				X	X	X	X
Salix lasiolepis	arroyo willow	FACW			X	X	X	X	X
Salix lemmonii	Lemmon's willow	FACW			X	X	X		X
Salix lutea	yellow willow	OBL	X						
Salix orestera	Sierra gray willow	FACW		X	X				X
Salix spp.	willow species	OBL/FACW			X				
Symphoricarpos rotundifolius	roundleaf snowberry	NI			X				
Tsuga mertensiana	mountain hemlock	FACU		X					
Vaccinium uliginosum var. *occidentale*	western blueberry	FACW		X					
Total Number of Species Per Sampling Site			**2**	**10**	**11**	**8**	**5**	**8**	**10**

[1] National Wetlands Inventory (NWI) Wetland Indicator Status as per the National Wetland Plant List (U.S. Army Corps of Engineers, 2020)
FAC = Equally likely to occur in wetlands and nonwetlands.
FACU = Usually occur in non-wetlands but occasionally found in wetlands
FACW = Usually occur in wetlands but occasionally found in non-wetlands.
NI = Not included on the National Wetland Plant List.
OBL = Obligate wetland species only found in wetlands.
UPL = Upland species not likely to occur in wetlands.

[2] Data was collected by E Read and Associates, Inc. in 2022 as part of long-term riparian monitoring sites within this reach.

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Table TERR 1-11. Riparian/Wetland Herbaceous and Graminoid Plants Observed at Selected Riparian Sampling Sites

Plant Species			Riparian Sampling Sites Where Species Observed						
Scientific Name	Common Name	NWI Indicator Status[1]	Waugh Lake	Rush Creek Below Rush Meadows Dam[2]	Rush Creek Below Agnew Dam	Rush Creek Above Silver Lake (RM 17.55)	Rush Creek Above Silver Lake (RM 17.05)	Rush Creek Below Silver Lake	South Rush Creek
Achillea millefolium	common yarrow	FACU		X					X
Ageratina occidentalis	western snakeroot	NI			X				
Agrostis humilis[3]	alpine bent grass[3]	FACW		X					
Agrostis spp.	Agrostis species	FACW – UPL	X						
Aira caryophyllea	silver hairgrass	FACU	X						
Allium bisceptrum	twincrest onion	FAC						X	
Allium validum	Pacific onion	OBL		X	X				
Angelica lineariloba	poison angelica	NI			X				
Antennaria rosea	rose pussytoes	NI		X					
Arnica mollis	Cordilleran arnica	FAC		X					
Artemisia dracunculus	tarragon	FACU			X				X
Artemisia tridentata	big sagebrush	NI							X
Bromus spp.	brome species	FAC – FACU							X
Bryophyta	moss species	NI			X		X		X
Calamagrostis canadensis	bluejoint	FACW		X	X		X	X	X
Calamagrostis stricta	slimstem reedgrass	FACW			X				
Carex abrupta	abrupt beaked sedge	FAC		X					
Carex aquatilis	water sedge	OBL			X		X	X	X
Carex athrostachya	slenderbeak sedge	FACW	X						
Carex feta	greensheath sedge	FACW	X						
Carex fracta	fragile sheath sedge	FAC	X						
Carex lenticularis	lakeshore sedge	OBL	X		X		X		
Carex multicostata	manyrib sedge	NI					X		
Carex pellita	woolly sedge	OBL			X		X	X	
Carex praegracilis	clustered field sedge	FACW	X						
Carex rossii	Ross' sedge	NI		X					
Carex spectabilis	showy sedge	FACW		X					
Carex spp.	Carex species	OBL – UPL		X					
Carex utriculata	Northwest Territory sedge	OBL					X		
Carex vesicaria	blister sedge	OBL		X					
Chamerion angustifolium	fireweed	NI		X					

Plant Species			Riparian Sampling Sites Where Species Observed						
Scientific Name	**Common Name**	**NWI Indicator Status[1]**	**Waugh Lake**	**Rush Creek Below Rush Meadows Dam[2]**	**Rush Creek Below Agnew Dam**	**Rush Creek Above Silver Lake (RM 17.55)**	**Rush Creek Above Silver Lake (RM 17.05)**	**Rush Creek Below Silver Lake**	**South Rush Creek**
Eleocharis macrostachya	common spikerush	NI		X					
Elymus elymoides	squirreltail	FACU			X				
Elymus glaucus	blue wildrye	FACU						X	X
Elymus spp.	wildrye species	FACW – FACU						X	
Epilobium ciliatum	fringed willowherb	FACW	X						
Epilobium glaberrimum	smooth willow herb	FACW		X					
Equisetum arvense	field horsetail	FAC			X	X	X	X	X
Equisetum hyemale	scouringrush horsetail	FACW				X			
Equisetum laevigatum	smooth horsetail	FACW						X	
Erigeron coulteri	Coulter's daisy	FACW		X					
Erigeron glacialis	wandering fleabane	FACW		X					
Erigeron spp.	daisy species	OBL – UPL		X					
Geum macrophyllum	largeleaf avens	FAC							X
Glyceria elata	fowl mannagrass	FACW				X			
Helenium bigelovii	Bigelow's sneezeweed	FACW			X		X	X	X
Hypericum anagalloides	Tinker's penny	OBL	X						
Ipomopsis aggregata ssp. bridgesii	scarlet gilia	NI						X	
Iris missouriensis	Rocky Mountain iris	FACW			X		X	X	
Juncus balticus	mountain rush	FACW			X		X		
Juncus drummondii	Drummond's rush	FACW		X					
Juncus nevadensis	Sierra rush	FACW		X					
Juncus orthophyllus	straightleaf rush	FACW	X	X					
Juncus parryi	Parry's rush	FAC	X						
Juncus spp.	rush species	OBL – FACU		X					
Juncus xiphioides	irisleaf rush	OBL				X			
Ligusticum grayi	Gray's licorice root	FAC		X					
Lilium kelleyanum	Kelley's lily	OBL			X				
Lonicera conjugalis	purpleflower honeysuckle	FAC							X
Lupinus argenteus	silvery lupine	NI						X	
Lupinus polyphyllus	bigleaf lupine	FAC		X					
Luzula spp.	wood rush species	OBL – UPL		X					
Luzula parviflora	small flowered wood rush	FAC		X					
Luzula subcongesta	Donner wood rush	FACW		X					

Plant Species			Riparian Sampling Sites Where Species Observed						
Scientific Name	**Common Name**	**NWI Indicator Status[1]**	**Waugh Lake**	**Rush Creek Below Rush Meadows Dam[2]**	**Rush Creek Below Agnew Dam**	**Rush Creek Above Silver Lake (RM 17.55)**	**Rush Creek Above Silver Lake (RM 17.05)**	**Rush Creek Below Silver Lake**	**South Rush Creek**
Maianthemum stellatum	starry false lily of the valley	FAC			X			X	
Mentha canadensis	wild mint	FACW					X		X
Monardella odoratissima	desert mint	UPL		X					
Muhlenbergia asperifolia	scratchgrass	FACW	X						
Osmorhiza occidentalis	western sweetroot	NI						X	
Parnassia palustris	marsh grass of Parnassus	OBL		X					
Pectiantia breweri	Brewer's miterwort	FAC		X					
Pedicularis spp.	*Pedicularis* species	OBL – FACU		X					
Penstemon newberryi	mountain pride	NI		X					
Perideridia parishii	Parish's yampah	FAC		X					
Phleum alpinum	alpine timothy	FAC		X					
Poaceae	unidentified grass species	OBL – UPL	X					X	X
Poa leptocoma	marsh bluegrass	FACW		X					
Poa pratensis	Kentucky bluegrass	FAC						X	X
Poa spp.	Poa species	OBL – UPL		X	X				
Poa wheeleri	Wheeler's bluegrass	FACU		X					
Potentilla flabellifolia	fan leaved cinquefoil	FAC		X					
Primula jeffreyi	Sierra shootingstar	FACW	X						
Pyrola minor	English wintergreen	FACU		X					
Ranunculus alismifolius	Alisma leaved buttercup	FACW		X					
Rumex paucifolius	alpine sheep sorrel	FAC		X					
Scirpus microcarpus	panicled bulrush	OBL				X	X		X
Senecio triangularis	arrow leaved ragwort	FACW		X					
Solidago elongata	Canada goldenrod	FACU						X	
Stellaria longipes	longstalk starwort	FACW		X					
Stipa nelsonii	mountain needle grass	UPL		X					
Streptanthus tortuosus	mountain jewelflower	NI	X						
Thalictrum fendleri	Fendler's meadow rue	FAC		X					
Trifolium monanthum	carpet clover	FAC		X					
Trifolium spp.	clover species	OBL – UPL					X		

Plant Species			Riparian Sampling Sites Where Species Observed						
Scientific Name	**Common Name**	**NWI Indicator Status[1]**	**Waugh Lake**	**Rush Creek Below Rush Meadows Dam[2]**	**Rush Creek Below Agnew Dam**	**Rush Creek Above Silver Lake (RM 17.55)**	**Rush Creek Above Silver Lake (RM 17.05)**	**Rush Creek Below Silver Lake**	**South Rush Creek**
Veratrum californicum	California false hellebore	FAC							X
Veronica wormskjoldii	American alpine speedwell	FACW		X					
Viola macloskeyi	Macloskey's violet	OBL		X					
Viola spp.	violet species	OBL – UPL		X					
Total Number of Species			**15**	**49**	**18**	**5**	**14**	**17**	**17**

[1] National Wetlands Inventory (NWI) Wetland Indicator Status as per the National Wetland Plant List (U.S. Army Corps of Engineers, 2020)
FAC = Equally likely to occur in wetlands and nonwetlands.
FACU = Usually occur in non-wetlands but occasionally found in wetlands
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NI = Not included on the National Wetland Plant List.
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UPL = Upland species not likely to occur in wetlands.

[2] Data was collected by E Read and Associates, Inc. in 2022 as part of long-term riparian monitoring.

[3] Alpine bentgrass is considered special-status (FSCC, CRPR 2B.3).

Table TERR 1-12. Percent Cover, by Age Class and Species, of Woody Riparian Species in the Potential Enhancement Area

Species Scientific Name	Species Common Name	Percent Cover by Age Class[1] (%)		
		Young	Medium	Old
Abies concolor	white fir	0.28	0.14	0.26
Cornus sericea	American dogwood	0.01	0.14	—
Juniperus spp.	juniper	—	—	—
Pinus contorta ssp. murrayana	lodgepole pine	1.37	6.24	34.53
Populus tremuloides	quaking aspen	16.79	16.15	33.61
Populus trichocarpa	black cottonwood	0.02	—	0.04
Rosa woodsii	Woods' rose	0.71	0.43	—
Salix exigua	sandbar willow	—	—	—
Salix geyeriana	Geyer's willow	—	2.34	6.27
Salix gooddingii	Goodding's willow	—	—	0.10
Salix lasiandra	Pacific willow	0.05	0.39	0.33
Salix lasiolepis	arroyo willow	—	2.35	3.57
Salix lemmonii	Lemmon's willow	0.05	0.69	0.41
Salix orestera	Sierra gray willow	0.05	0.14	0.12
Salix scouleriana	Scouler's willow	—	—	—

[1] Percent cover is the total proportion of the riparian community within the potential enhancement area. Species with no values were identified in the riparian community in the potential enhancement area (i.e., a few individuals) but did not account for a significant portion of cover.

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FIGURES

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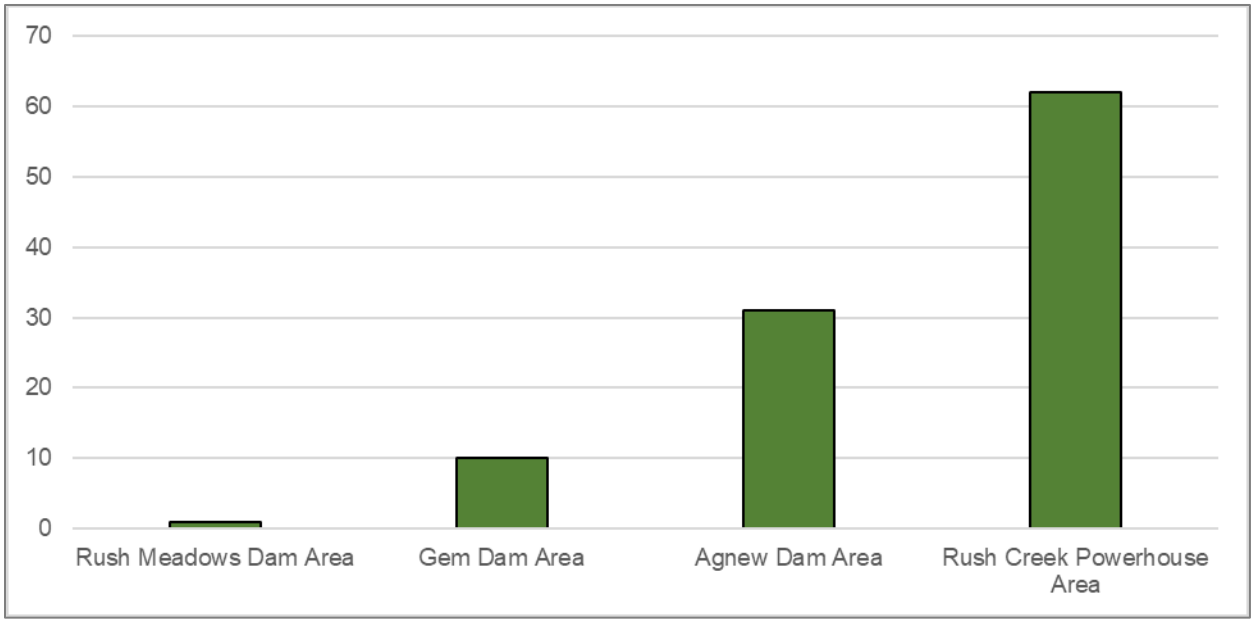
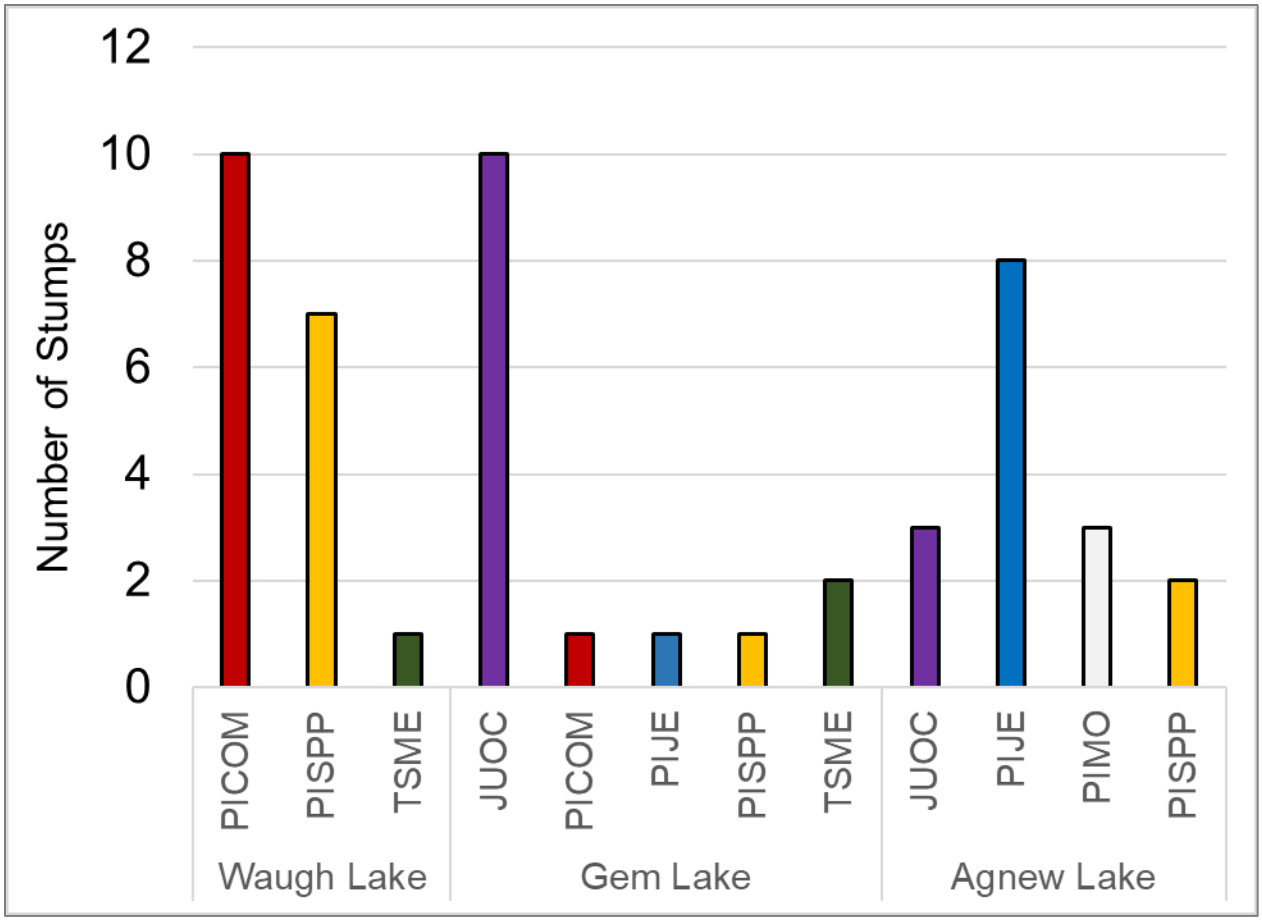
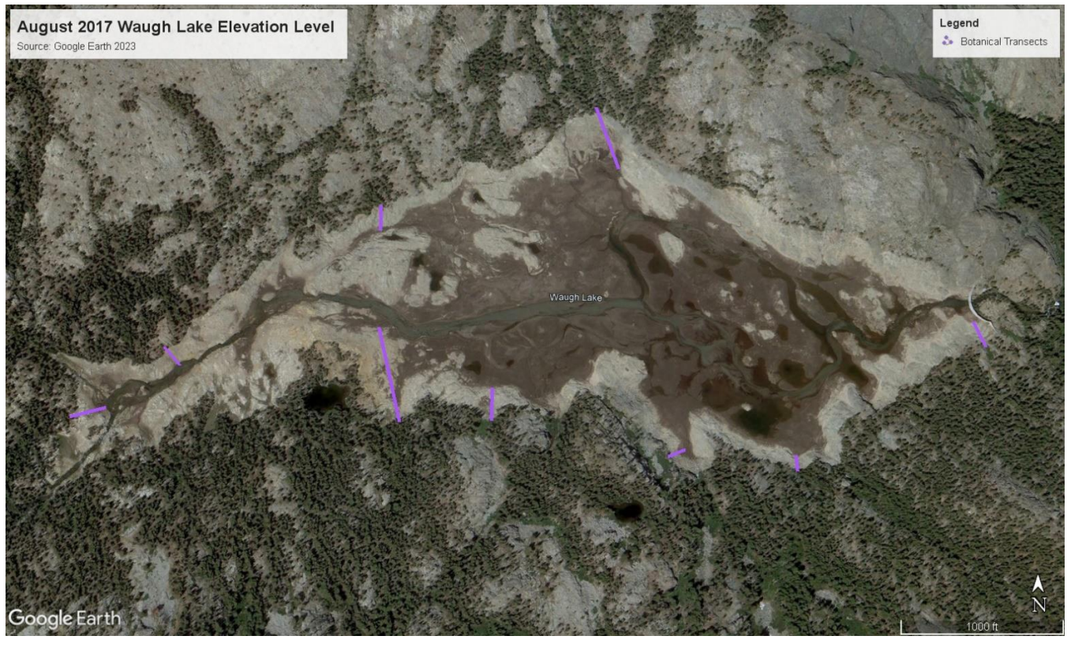


Figure TERR 1-1. Total Occurrences of Non-native Invasive Plants by Geographic Area

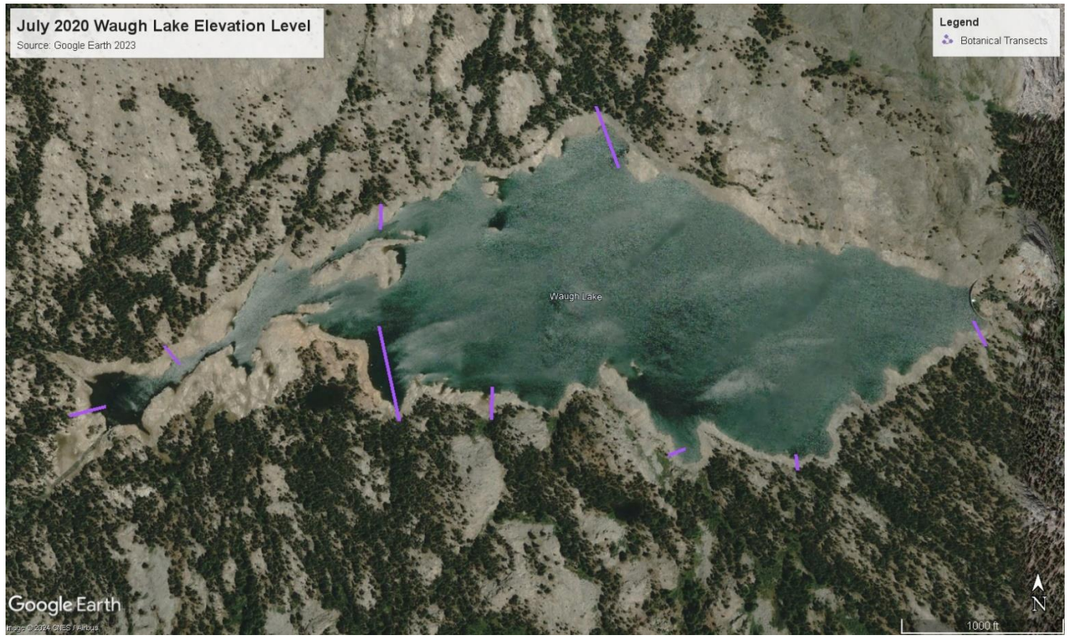


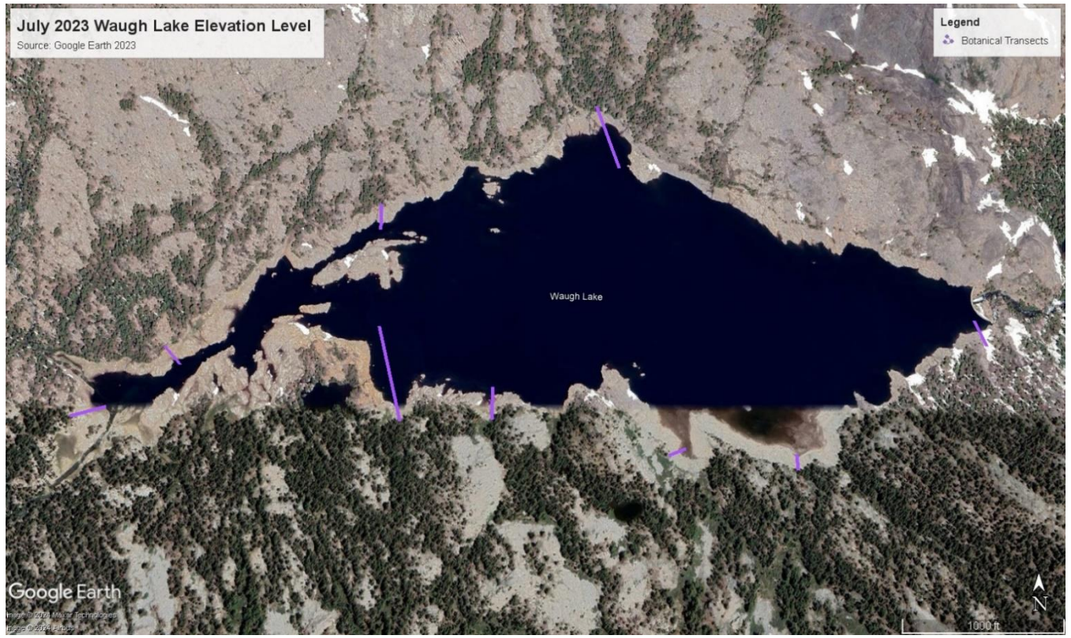
JUOC = Western Juniper (*Juniperus occidentalis*)
PICOM = Lodgepole Pine (*Pinus contorta* ssp. *murrayana*)
PIJE = Jeffrey Pine (*Pinus occidentalis*)
PIMO = Western White Pine (*Pinus monticola*)
PISPP = Unknown Pine Species (*Pinus* spp.)
TSME = Mountain Hemlock (*Tsuga mertensiana*)

Figure TERR 1-2. Species Determinations for Stump Samples by Reservoir









Purple lines indicate locations of botanical transects within the historic inundation zone of Waugh Lake.

Figure TERR 1-3. Transect Inundation Frequency Within Waugh Lake Since 2017

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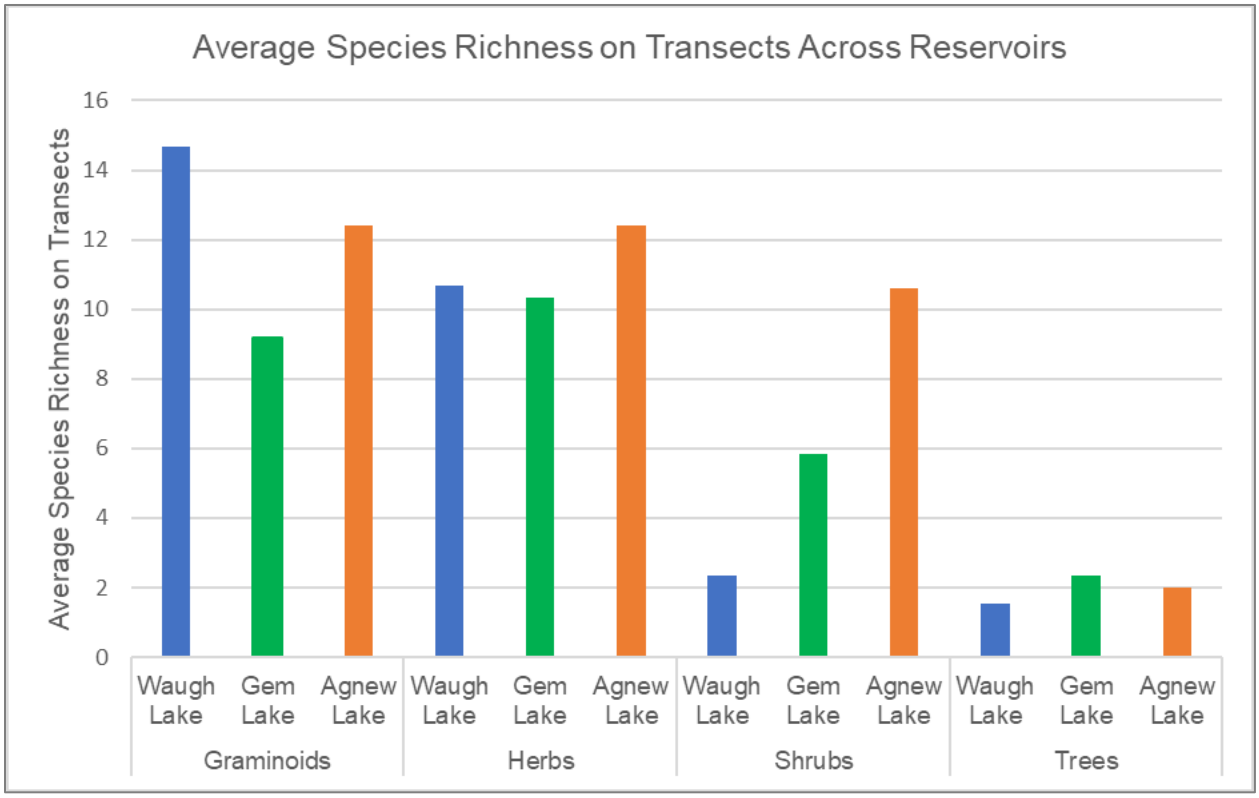


Figure TERR 1-4. Average Species Richness of Graminoids, Herbs, Shrubs, and Trees Across Historic Reservoir Inundation Zones

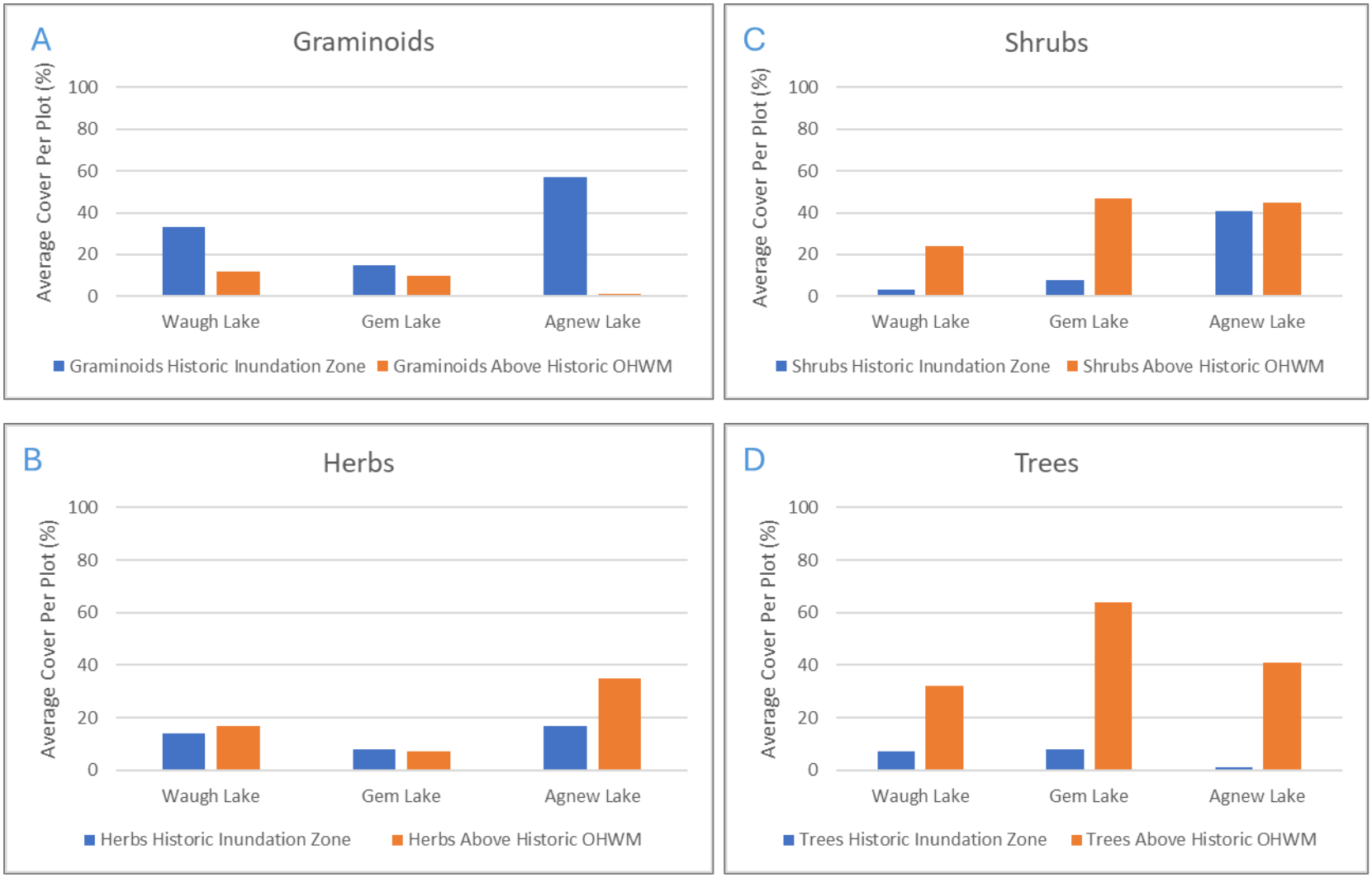
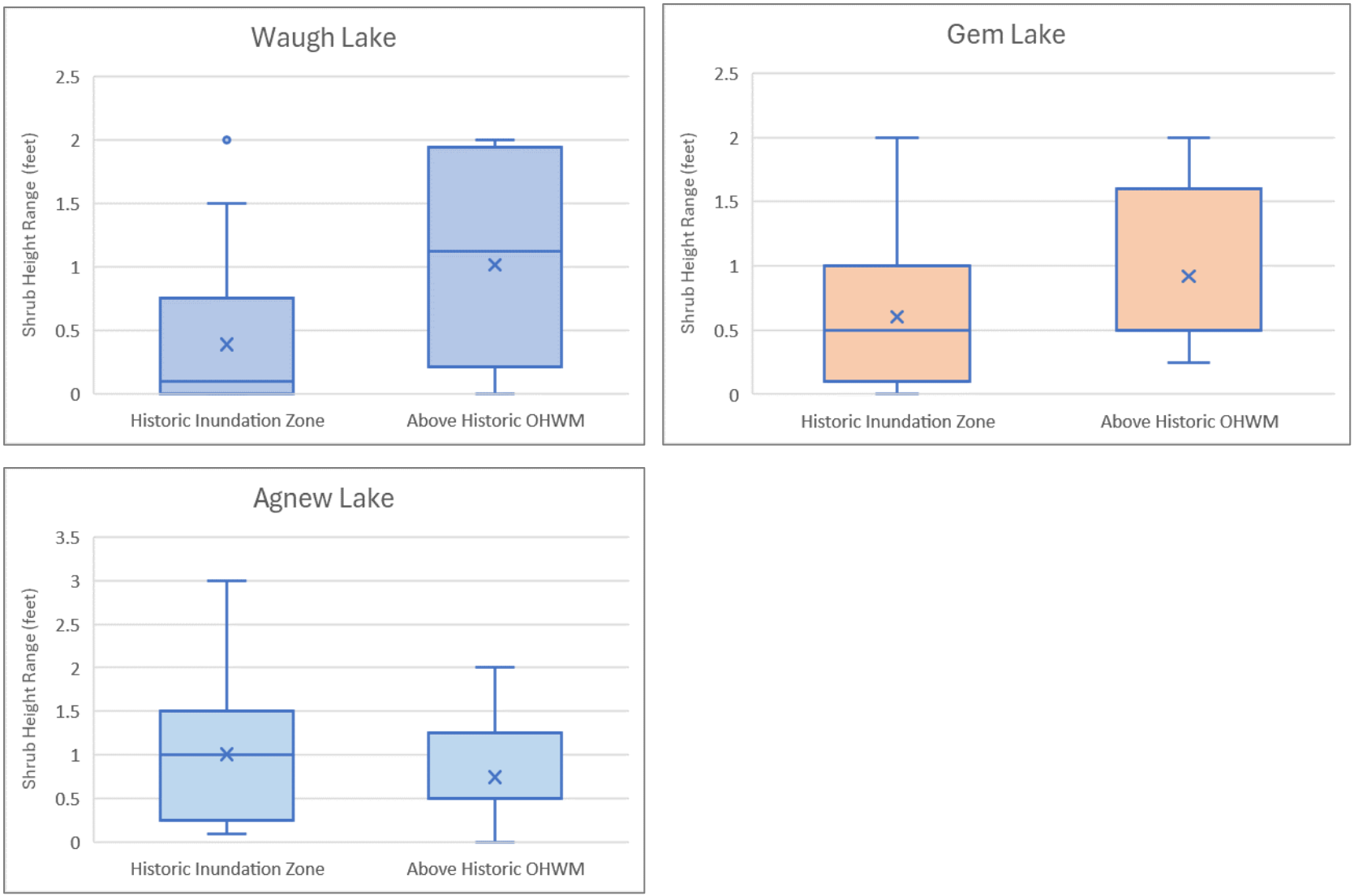


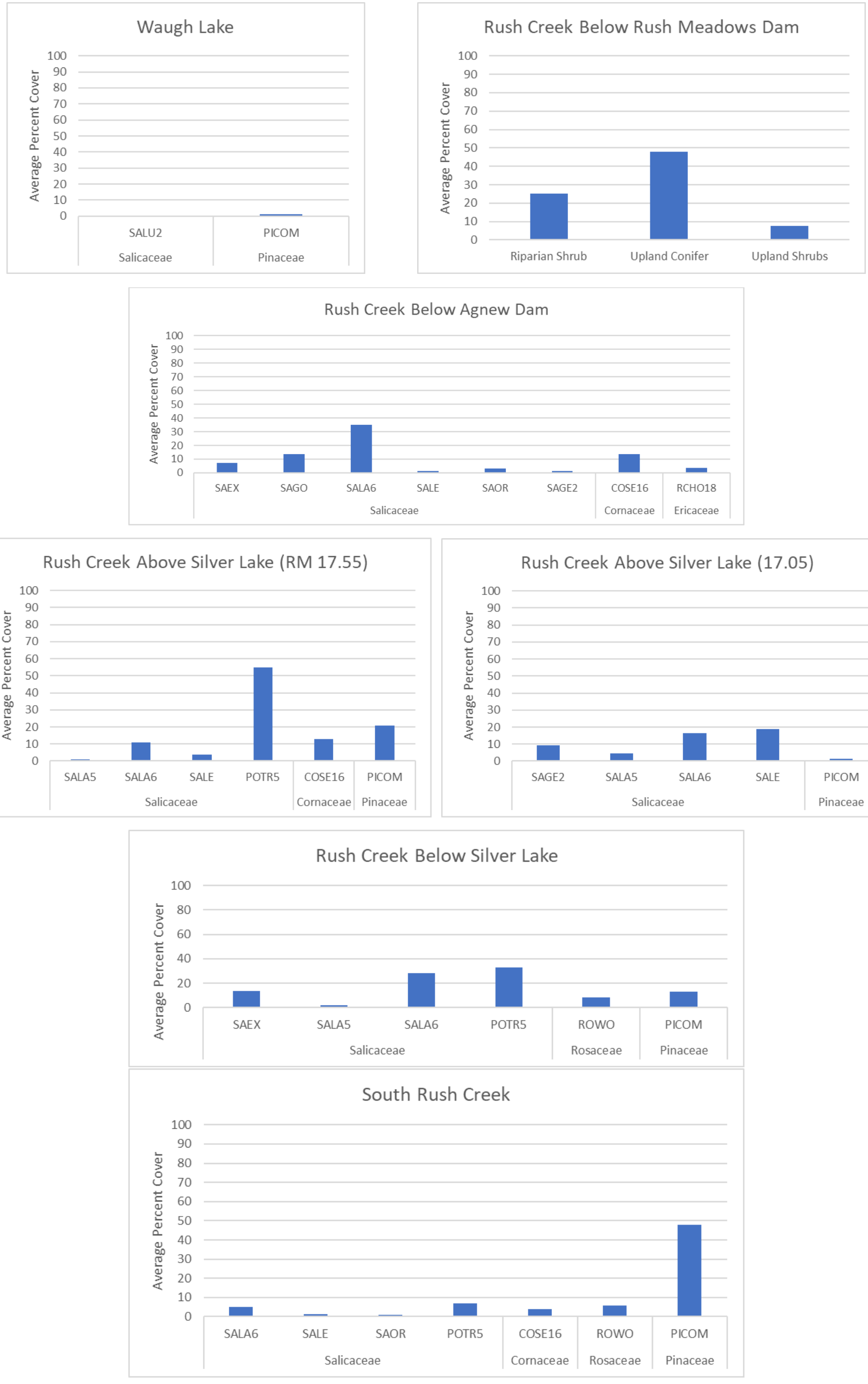
Figure TERR 1-5. Average Percent Cover of Graminoids, Herbs, Shrubs, and Trees in Plots Across Historic Reservoir Inundation Zones



Outermost bars show the range of shrub heights, while the X shows the average shrub height. The majority (75%) of the observations are contained within the central box.

Figure TERR 1-6. Shrub Height Compared Between Plots in the Historic Inundation Zone and Above Historic Ordinary High Water Mark

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Data at Rush Creek below Rush Meadows Dam was collected consistent with Forest Service Final 4(e) Condition No. 7 under the existing license (FERC 1997). Long-term monitoring data was last collected at stream segment in 2022. The values shown here are taken directly from the 2022 monitoring report. A full description of the riparian sampling methods and results for this stream segment is available in the final monitoring report filed with FERC on April 25, 2023 (E Read and Associates, Inc. 2023).

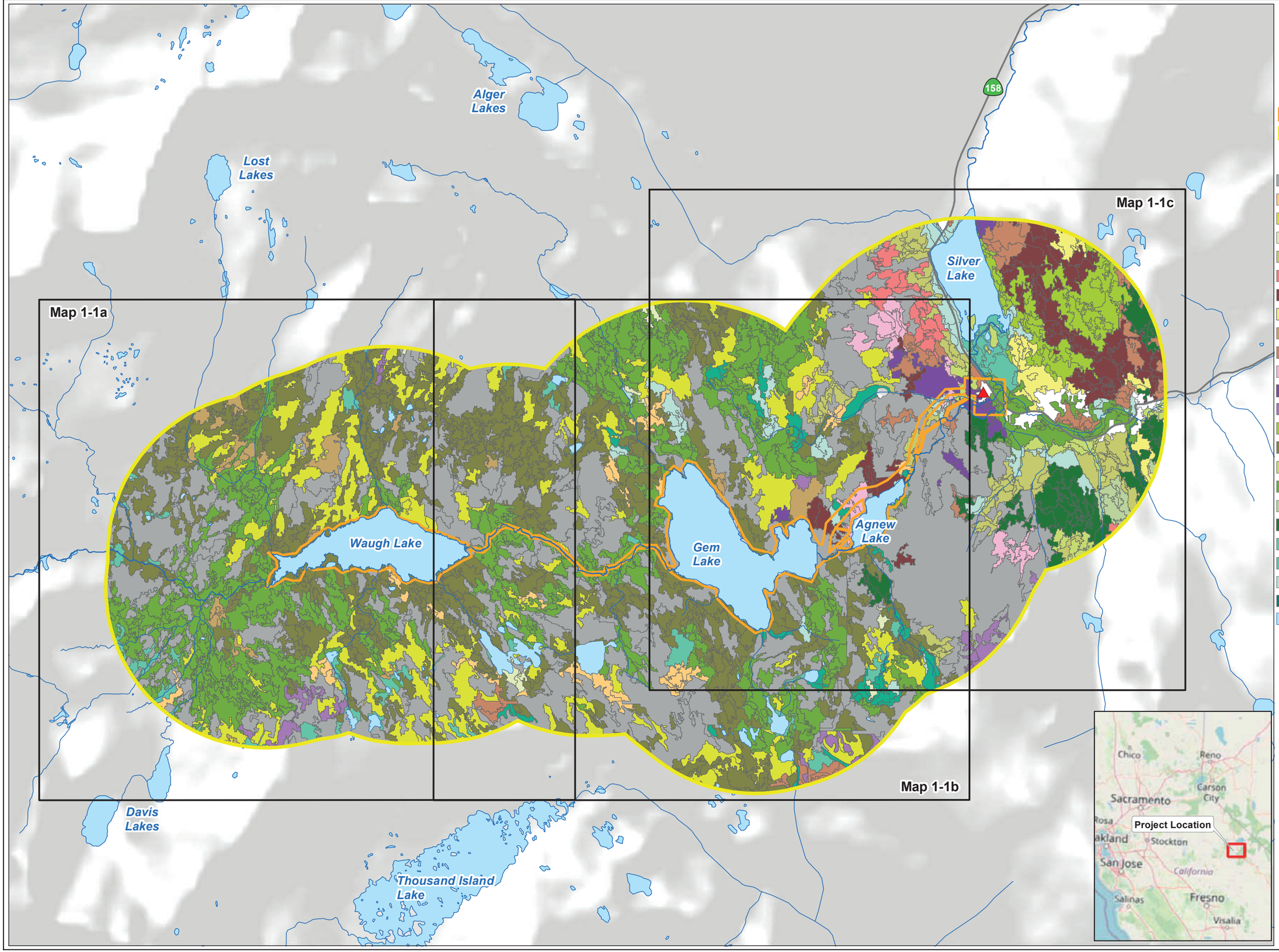
Species Codes: **Salicaceae**: SAEX = *Salix exigua*, SAGE2 = *Salix geyeriana*, SAGO = *Salix gooddingii*, SALA5 = *Salix lasiandra*, SALA 6 = *Salix lasiolepis*, SALE = *Salix lemmonii*, SALU2 = *Salix lutea,* SAOR = *Salix orestera*, POTR5 = *Populus tremuloides*. **Cornaceae**: COSE16 = *Cornus sericea*. **Ericaceae**: RHCO18 = *Rhododendron columbianum* **Rosaceae:** ROWO = *Rosa woodsii* **Pinaceae**: PICOM = *Pinus contorta* spp. *murrayana*

Figure TERR 1-7. Average Percent Cover of Woody Riparian Trees/Shrubs Across Selected Riparian Sampling Sites

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MAPS

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SCE Facilities

- Powerhouse

Other Features

- Highway
- River/Stream
- FERC Boundary
- 1-Mile FERC Boundary Buffer

CALVEG Vegetation Alliances*

- Barren (BA)
- Urban Non-Vegetated (IB)
- Alpine Mixed Scrub Alliance (AX)
- Alpine Grasses and Forbs Alliance (AC)
- Annual Grasses and Forbs Alliance (HG)
- Upper Montane Mixed Chaparral Alliance (CX)
- Great Basin-Mixed Chaparral Transition Alliance (BX)
- Curlleaf Mountain Mahogany Alliance (BM/FM)
- Great Basin Mixed Scrub Alliance (BQ)
- Low Sagebrush Alliance (BL)
- Big Sagebrush Alliance (BS)
- Snowbrush Alliance (CV)
- Western (Mountain) Juniper Alliance (WJ)
- Whitebark Pine Alliance (WB)
- Eastside Pine Alliance (EP)
- Subalpine Conifers Alliance (SA)
- Jeffrey Pine Alliance (JP)
- Lodgepole Pine Alliance (LP)
- White Fir Alliance (WF)
- Mixed Conifer - Fir Alliance (MF)
- Wet Meadows Alliance (HJ)
- Willow Alliance (QO)
- Quaking Aspen Alliance (QQ)
- Willow (Shrub) Alliance (WL)
- Water (WA)

*Source: USDA-FS CALVEG, 2018
Stantec, 2023

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Rush Creek Project (FERC 1389)

Map TERR 1-1

CALVEG Vegetation Alliances Occurring within the Study Area

0 0.25 0.5 Miles

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/19/2024

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Lost Lakes

Waugh Lake

Marie Lakes

Rodgers Lakes

Davis Lakes

Weber Lake

Sullivan Lake

Thousand Island Lake

SCE Facilities

- Powerhouse

Other Features

- Highway
- River/Stream
- FERC Boundary
- 1-Mile FERC Boundary Buffer

CALVEG Vegetation Alliances*

- Barren (BA)
- Urban Non-Vegetated (IB)
- Alpine Mixed Scrub Alliance (AX)
- Alpine Grasses and Forbs Alliance (AC)
- Annual Grasses and Forbs Alliance (HG)
- Upper Montane Mixed Chaparral Alliance (CX)
- Great Basin-Mixed Chaparral Transition Alliance (BX)
- Curlleaf Mountain Mahogany Alliance (BM/FM)
- Great Basin Mixed Scrub Alliance (BQ)
- Low Sagebrush Alliance (BL)
- Big Sagebrush Alliance (BS)
- Snowbrush Alliance (CV)
- Western (Mountain) Juniper Alliance (WJ)
- Whitebark Pine Alliance (WB)
- Eastside Pine Alliance (EP)
- Subalpine Conifers Alliance (SA)
- Jeffrey Pine Alliance (JP)
- Lodgepole Pine Alliance (LP)
- White Fir Alliance (WF)
- Mixed Conifer - Fir Alliance (MF)
- Wet Meadows Alliance (HJ)
- Willow Alliance (QO)
- Quaking Aspen Alliance (QQ)
- Willow (Shrub) Alliance (WL)
- Water (WA)

*Source: USDA-FS CALVEG, 2018
Stantec, 2023

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

Rush Creek Project (FERC 1389)

Map TERR 1-1a

CALVEG Vegetation Alliances Occurring within the Study Area

0 500 1,000 2,000 Feet

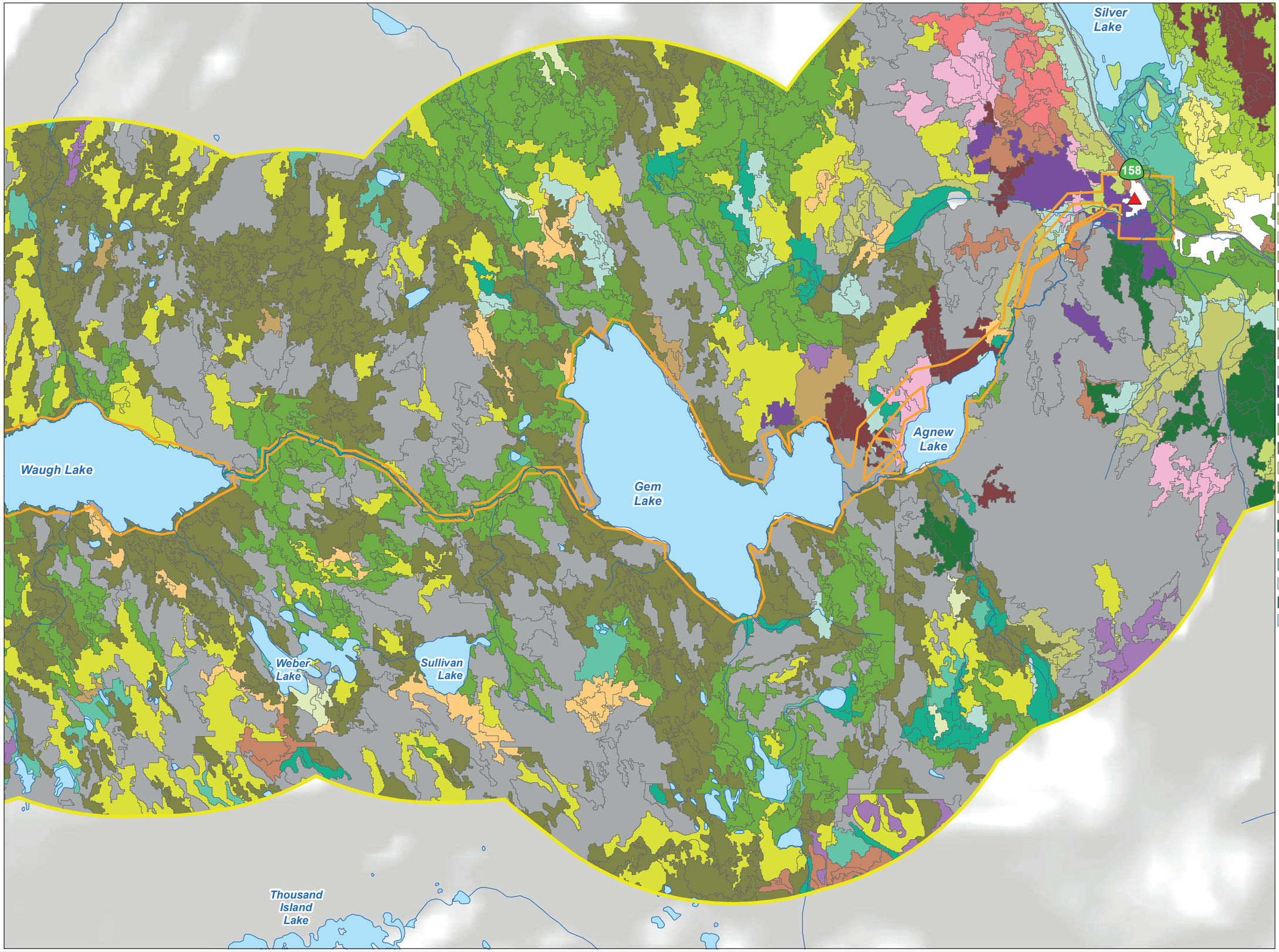
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SCE Facilities

- Powerhouse

Other Features

- Highway
- River/Stream
- FERC Boundary
- 1-Mile FERC Boundary Buffer

CALVEG Vegetation Alliances*

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- Mixed Conifer - Fir Alliance (MF)
- Wet Meadows Alliance (HJ)
- Willow Alliance (QO)
- Quaking Aspen Alliance (QQ)
- Willow (Shrub) Alliance (WL)
- Water (WA)

*Source: USDA-FS CALVEG, 2018
Stantec, 2023

SOUTHERN CALIFORNIA EDISON®
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Rush Creek Project (FERC 1389)

Map TERR 1-1b

CALVEG Vegetation Alliances Occurring within the Study Area

0 500 1,000 2,000 Feet

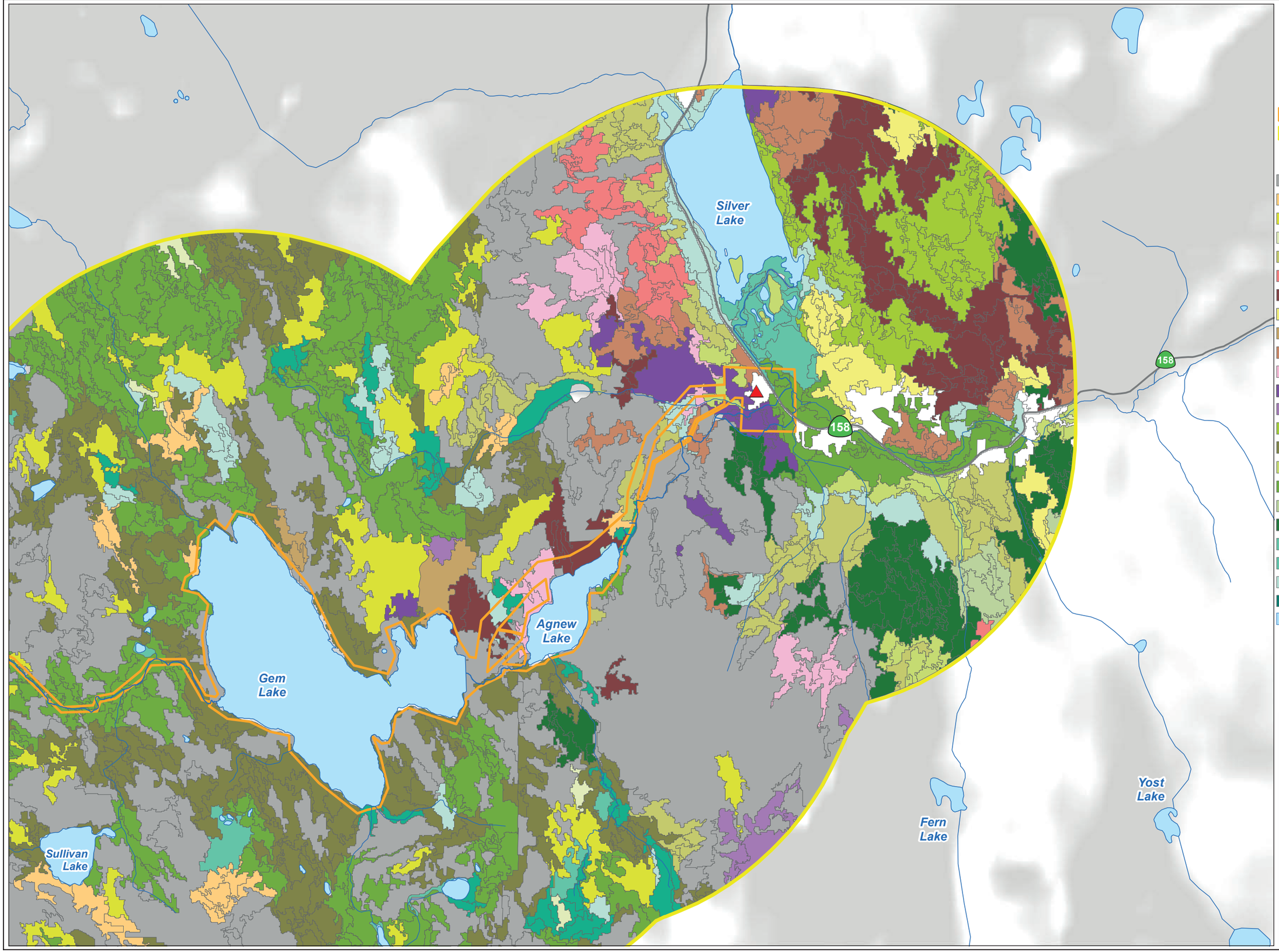
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Datum: NAD 83

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SCE Facilities

- Powerhouse

Other Features

- Highway
- River/Stream
- FERC Boundary
- 1-Mile FERC Boundary Buffer

CALVEG Vegetation Alliances*

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- Wet Meadows Alliance (HJ)
- Willow Alliance (QO)
- Quaking Aspen Alliance (QQ)
- Willow (Shrub) Alliance (WL)
- Water (WA)

*Source: USDA-FS CALVEG, 2018
Stantec, 2023

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Rush Creek Project (FERC 1389)

Map TERR 1-1c

CALVEG Vegetation Alliances Occurring within the Study Area

0 500 1,000 2,000 Feet

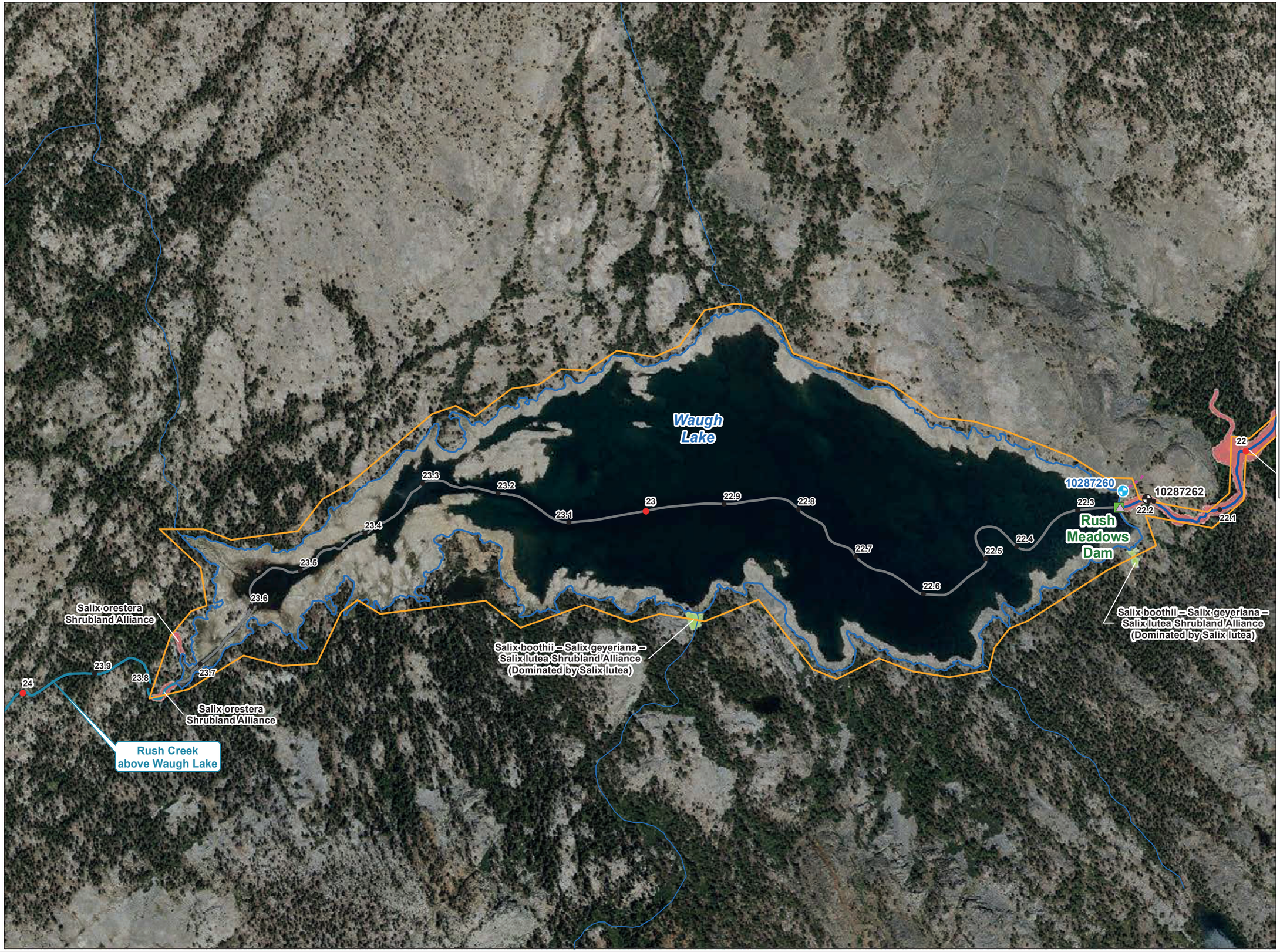
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Datum: NAD 83

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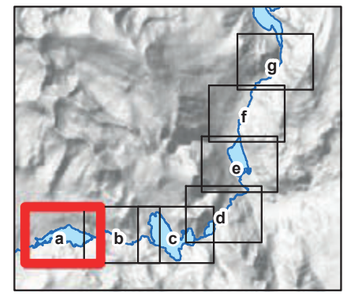
- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- River Mile / 10th Mile

Riparian Alliances

- Pinus contorta ssp. murrayana Forest Alliance
- Populus tremuloides Forest Alliance
- Salix boothii – Salix geyeriana – Salix lutea Shrubland Alliance
- Salix exigua Shrubland Alliance
- Salix lasiolepis Shrubland Alliance
- Salix lemmonii Shrubland Alliance
- Salix orestera Shrubland Alliance



SOUTHERN CALIFORNIA EDISON
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Rush Creek Project (FERC 1389)

Map TERR 1-2a

Riparian Vegetation Alliances on Project-Affected Stream Segments and Project Reservoirs

0 250 500 Feet

Date: 3/13/2024

Projection: UTM Zone 11
Datum: NAD 83

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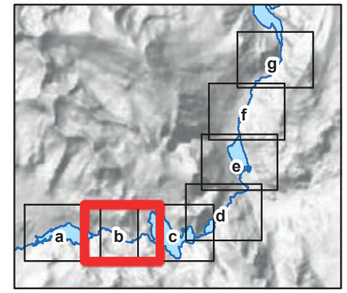
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- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
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- Salix orestera Shrubland Alliance



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Rush Creek Project (FERC 1389)

Map TERR 1-2b

Riparian Vegetation Alliances on Project-Affected Stream Segments and Project Reservoirs

0 250 500 Feet

Date: 3/13/2024

Projection: UTM Zone 11
Datum: NAD 83

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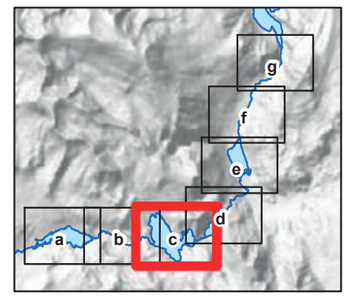
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- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
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- Power or Communication Line
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Other Features

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- Salix orestera Shrubland Alliance



SOUTHERN CALIFORNIA EDISON
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Rush Creek Project (FERC 1389)

Map TERR 1-2c

Riparian Vegetation Alliances on Project-Affected Stream Segments and Project Reservoirs

0 250 500 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 2/14/2024

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SCE Facilities

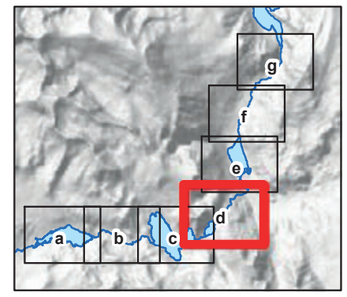
- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- River Mile / 10th Mile

Riparian Alliances

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- Salix lemmonii Shrubland Alliance
- Salix orestera Shrubland Alliance



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Rush Creek Project (FERC 1389)

Map TERR 1-2d

Riparian Vegetation Alliances on Project-Affected Stream Segments and Project Reservoirs

0 250 500 Feet

Projection: UTM Zone 11
Datum: NAD 83

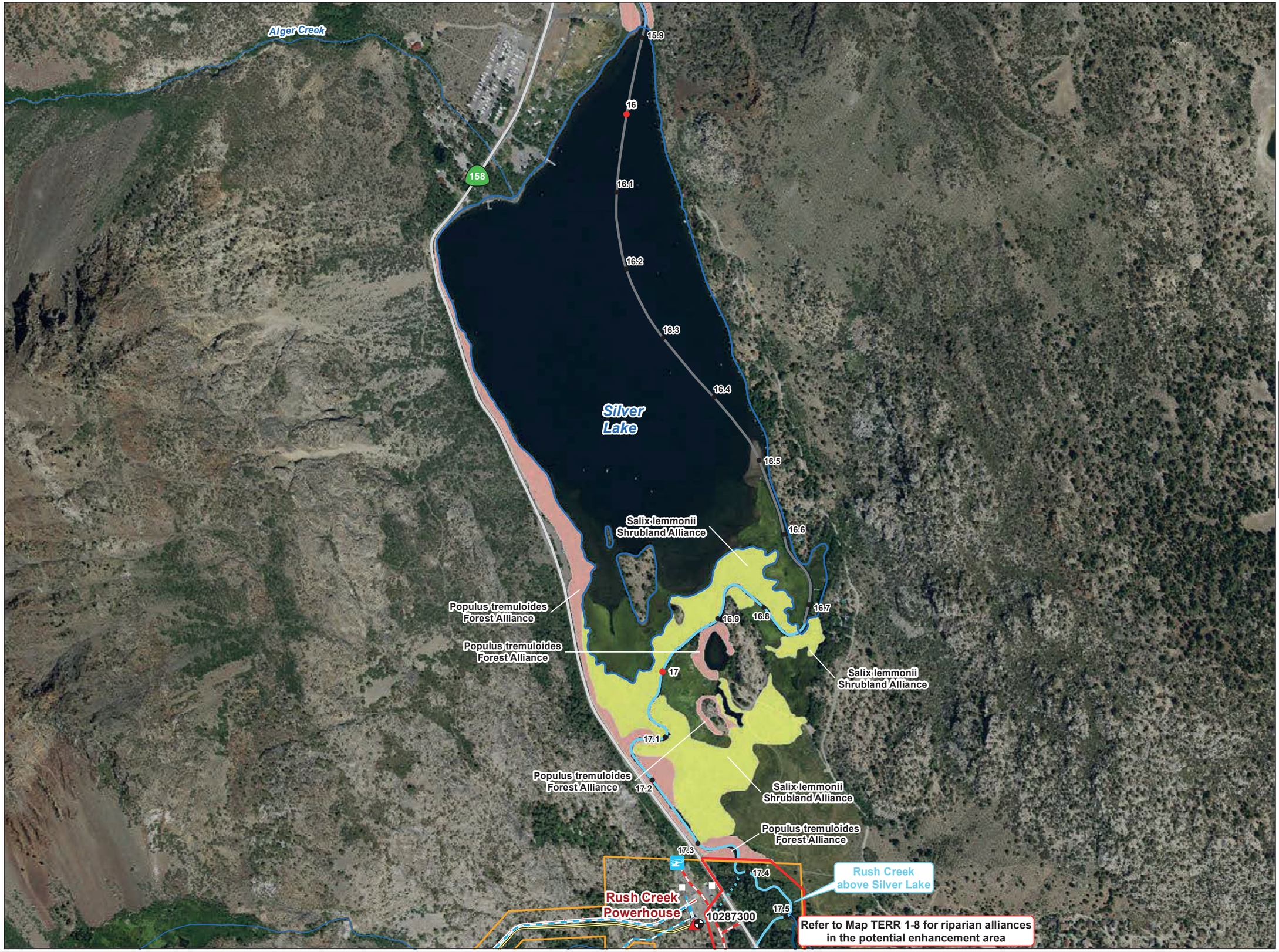
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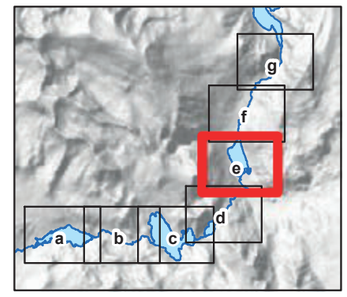
- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- River Mile / 10th Mile

Riparian Alliances

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Rush Creek Project (FERC 1389)

Map TERR 1-2e

Riparian Vegetation Alliances on Project-Affected Stream Segments and Project Reservoirs

0 250 500 Feet

Projection: UTM Zone 11
Datum: NAD 83

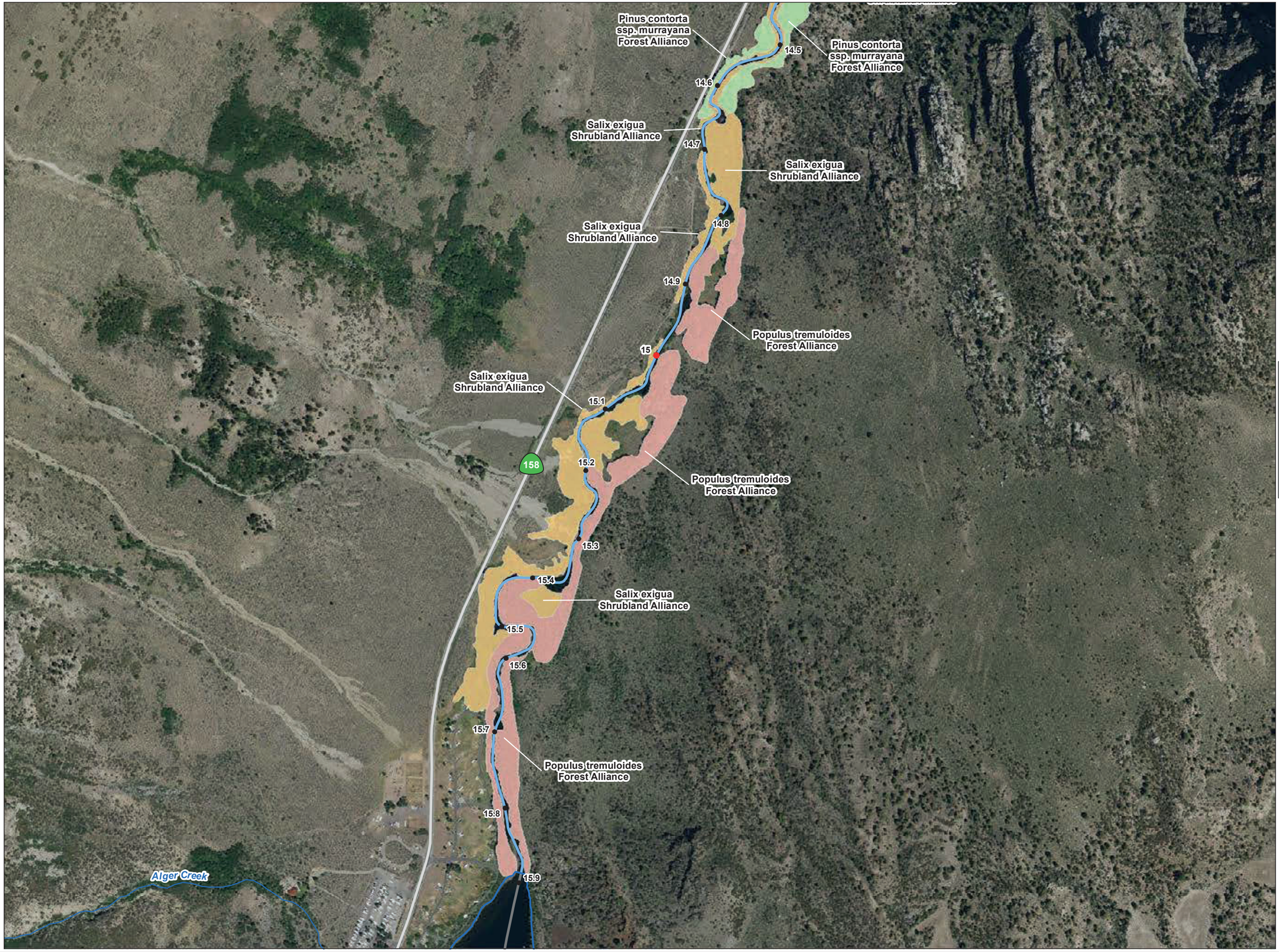
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SCE Facilities

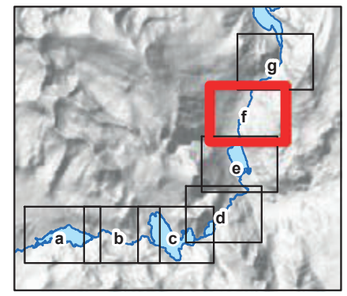
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- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- River Mile / 10th Mile

Riparian Alliances

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Rush Creek Project (FERC 1389)

Map TERR 1-2f

Riparian Vegetation Alliances on Project-Affected Stream Segments and Project Reservoirs

0 250 500 Feet

Projection: UTM Zone 11
Datum: NAD 83

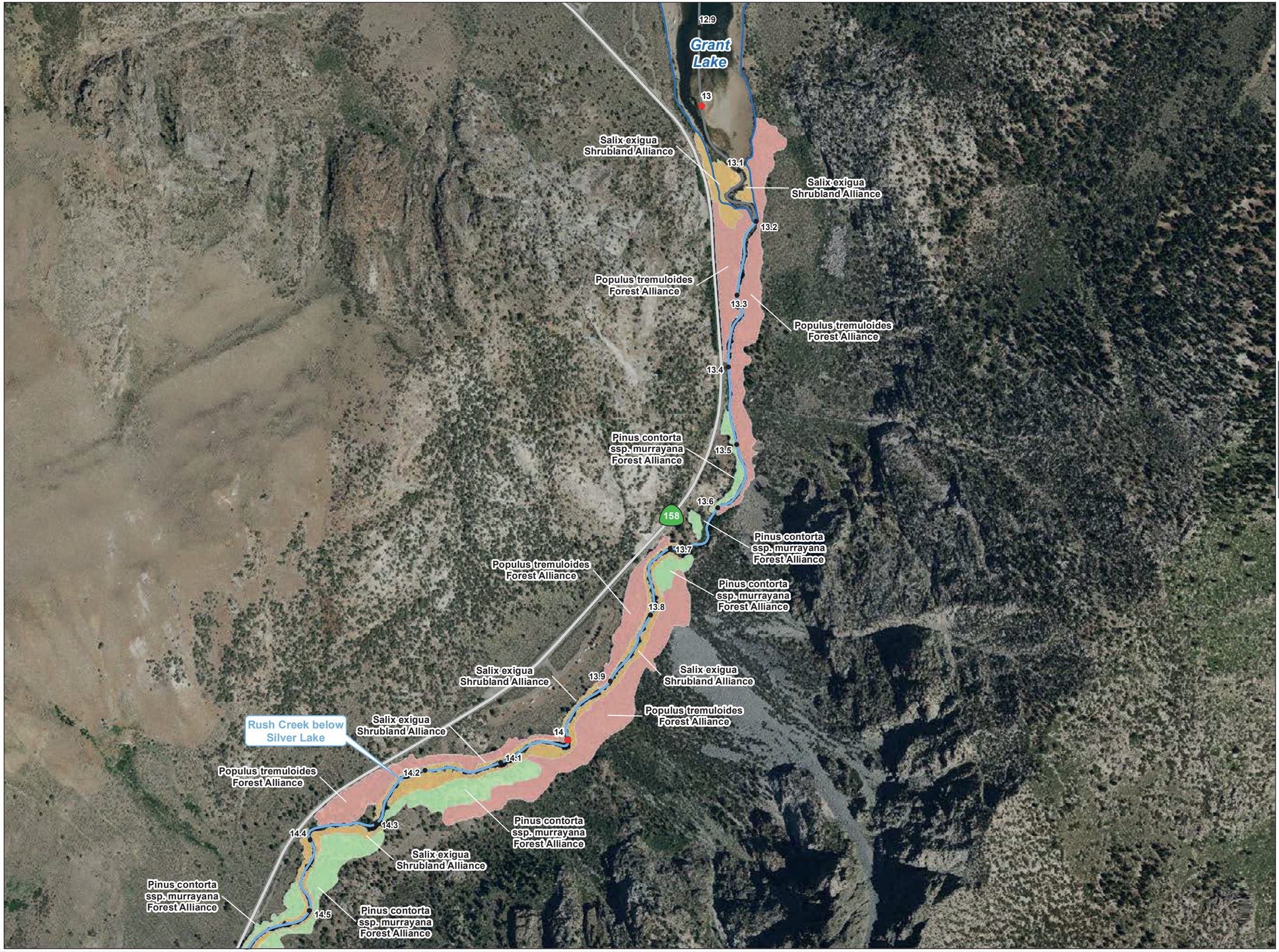
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SCE Facilities

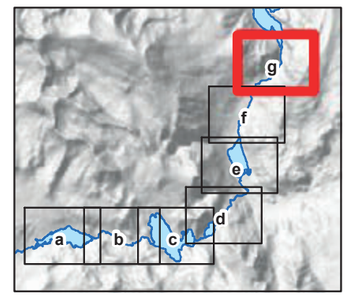
- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- River Mile / 10th Mile

Riparian Alliances

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- Salix orestera Shrubland Alliance



SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map TERR 1-2g

Riparian Vegetation Alliances on Project-Affected Stream Segments and Project Reservoirs

0 250 500 Feet

Date: 2/14/2024

Projection: UTM Zone 11
Datum: NAD 83

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The following map is being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of special-status biological resources and qualifies as Confidential Information (18 Code of Federal Regulations § 385.1112). Disclosure of such information could be harmful to these resources. To further understand the Federal Energy Regulatory Commission's regulations regarding confidential filings, visit: https://www.ferc.gov/foia.

Maps TERR 1-3a-i Special-Status Plant Species Occurring Within the FERC Project Boundary (Confidential)

Maps TERR 1-3a-i will not be distributed to the general public. Documents containing Confidential Information may be requested by entities and organizations with jurisdiction over these resources. To request copies, please contact Matthew Woodhall, SCE Relicensing Project Manager at (909) 362-1764 or matthew.woodhall@sce.com.

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RUSH CREEK TR

Waugh Lake

23.0

Rush Creek

SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- Non-Project Trail

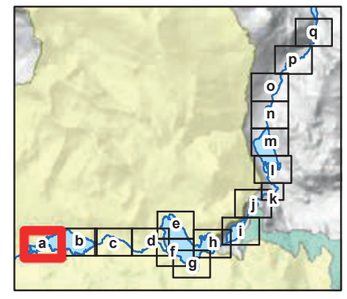
General Sampling Locations

- Riparian Sampling Sites

Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.



Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wildernes are located on USFS Lands

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Rush Creek Project (FERC 1389)

Map TERR 1-4a

Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity

0 50 100 200 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/27/2024

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RUSH CREEK TR

WEBER LAKE TR

Waugh Lake

23.0

Rush Meadows Dam

Rush Creek

Rush Meadows Dam

SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- Non-Project Trail

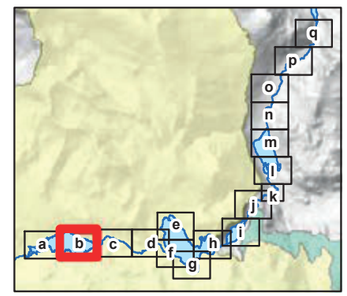
General Sampling Locations

- Riparian Sampling Sites

Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.



Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wildernes are located on USFS Lands

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

Rush Creek Project (FERC 1389)

Map TERR 1-4b

Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity

0 50 100 200 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/27/2024

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Frontier Pack Station Camp Pack Station
RUSH CREEK TR
Rush Creek
21.65
Rush Meadows Dam
Waugh Lake
WEBER LAKE TR

Land Management

National Wilderness Area**

Ansel Adams Wilderness

Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wildernes are located on USFS Lands

SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- Non-Project Trail

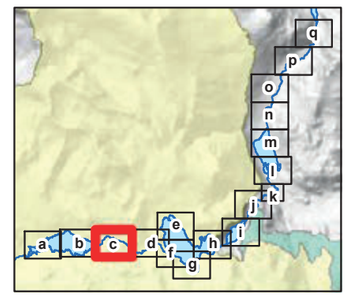
General Sampling Locations

- Riparian Sampling Sites

Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.



SOUTHERN CALIFORNIA EDISON
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Rush Creek Project (FERC 1389)

Map TERR 1-4c

Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity

0 50 100 200 Feet

Date: 3/27/2024

Projection: UTM Zone 11
Datum: NAD 83

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Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wildernes are located on USFS Lands

RUSH CREEK TR

Billy Lake Stock Camp Pack Station

Rush Creek

CLARK LAKES TR

Gem Lake

Gem Lake 1

SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- Non-Project Trail

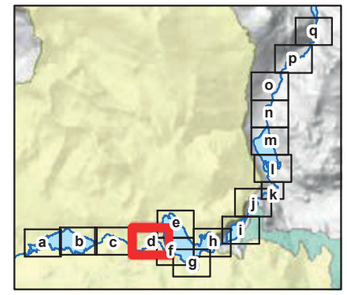
General Sampling Locations

- Riparian Sampling Sites

Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.



SOUTHERN CALIFORNIA EDISON®
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Rush Creek Project (FERC 1389)

Map TERR 1-4d

Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity

0 50 100 200 Feet

Projection: UTM Zone 11
Datum: NAD 83

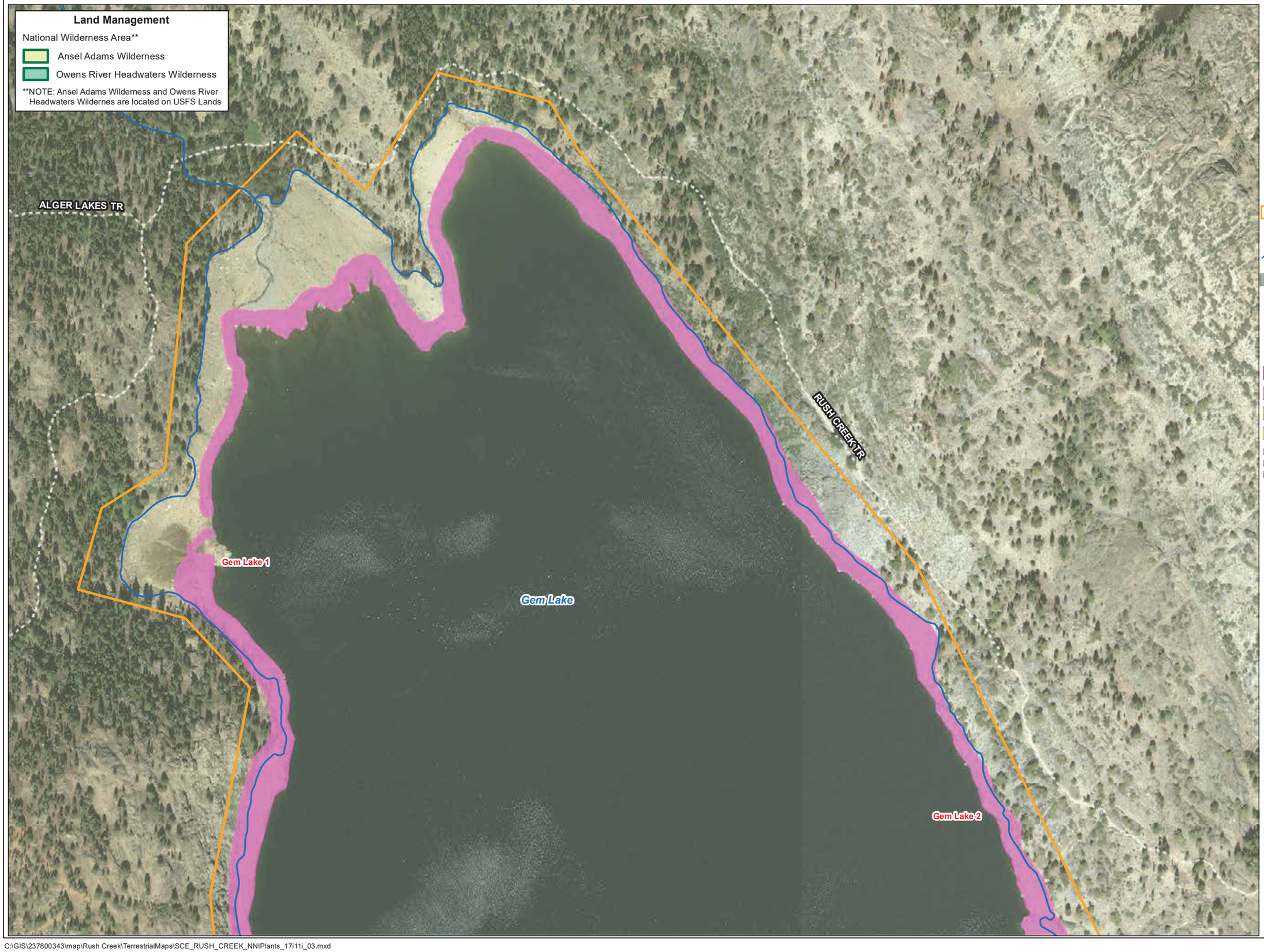
Date: 3/27/2024

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SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- Non-Project Trail

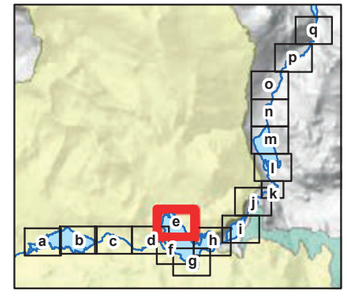
General Sampling Locations

- Riparian Sampling Sites

Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.



SOUTHERN CALIFORNIA EDISON
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Rush Creek Project (FERC 1389)

Map TERR 1-4e

Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity

0 50 100 200 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/27/2024

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SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- Non-Project Trail

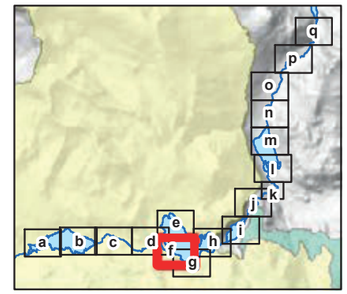
General Sampling Locations

- Riparian Sampling Sites

Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.



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Rush Creek Project (FERC 1389)

Map TERR 1-4f

Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity

0 50 100 200 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/27/2024

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Gem Lake

Gem Lake 3

SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- Non-Project Trail

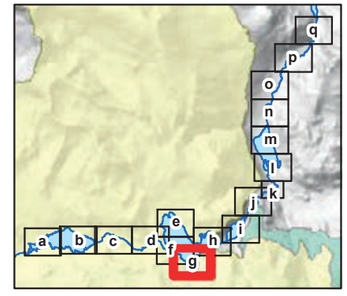
General Sampling Locations

- Riparian Sampling Sites

Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.



Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wildernes are located on USFS Lands

SOUTHERN CALIFORNIA EDISON
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Rush Creek Project (FERC 1389)

Map TERR 1-4g

Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity

0 50 100 200 Feet

Projection: UTM Zone 11
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Gem Dam to Agnew Junction Penstock 2

Gem Dam to Agnew Junction Penstock 1

RUSH CREEK TR

Gem Lake 2

Agnew Lake 1

Agnew Lake

Gem Dam

Rush Creek

Gem Lake

Gem Boat Dock

Gem Lake 3

SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- Non-Project Trail

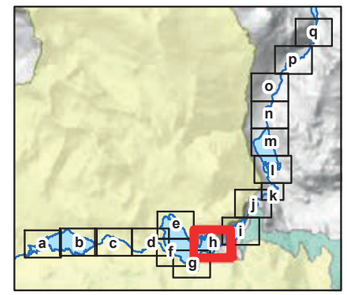
General Sampling Locations

- Riparian Sampling Sites

Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.



Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wildernes are located on USFS Lands

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Rush Creek Project (FERC 1389)

Map TERR 1-4h

Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity

0 50 100 200 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/27/2024

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Gem Dam to Agnew Junction Penstock 6
Agnew Dam
Rush Creek
18.55
Gem Dam to Agnew Junction Penstock 5
Agnew Dam
RUSH CREEK TR
Agnew Lake 5
Gem Dam to Agnew Junction Penstock 4
Agnew Lake 3
Gem Dam to Agnew Junction Penstock 3
Agnew Lake 4
Agnew Lake 2
Gem Dam to Agnew Junction Penstock 2
Agnew Lake
SPOOKY MEADOW TR
Agnew Lake 1
Agnew Lake 1
Rush Creek

SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- Non-Project Trail

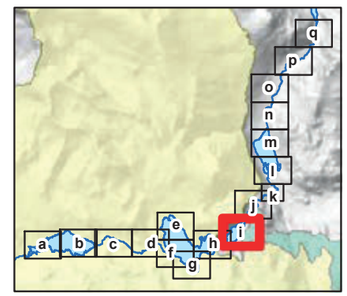
General Sampling Locations

- Riparian Sampling Sites

Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.



Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wildernes are located on USFS Lands

SOUTHERN CALIFORNIA EDISON
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Rush Creek Project (FERC 1389)

Map TERR 1-41

Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity

0 50 100 200 Feet

Projection: UTM Zone 11
Datum: NAD 83

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Agnew Tram 4
Agnew Tram 5
Agnew Tram 7
Powerline to Agnew Dam 4
Powerline to Agnew Dam 3
Cottage and Woodshed
Agnew Tram 3
Rush Creek
Powerline to Agnew Dam 2
Rush Creek Powerhouse 9
Rush Creek
Powerline to Agnew Dam 1
Agnew Tram 2
Rush Creek Powerhouse 1
Agnew Tram 1
RUSH CREEK TR
Rush Creek
SPOOKY MEADOW TR
Agnew Dam

SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- Non-Project Trail

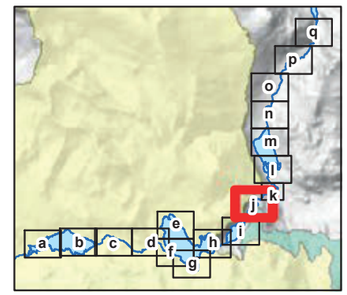
General Sampling Locations

- Riparian Sampling Sites

Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.



Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wildernes are located on USFS Lands

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

Rush Creek Project (FERC 1389)

Map TERR 1-4j

Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity

0 50 100 200 Feet

Projection: UTM Zone 11
Datum: NAD 83

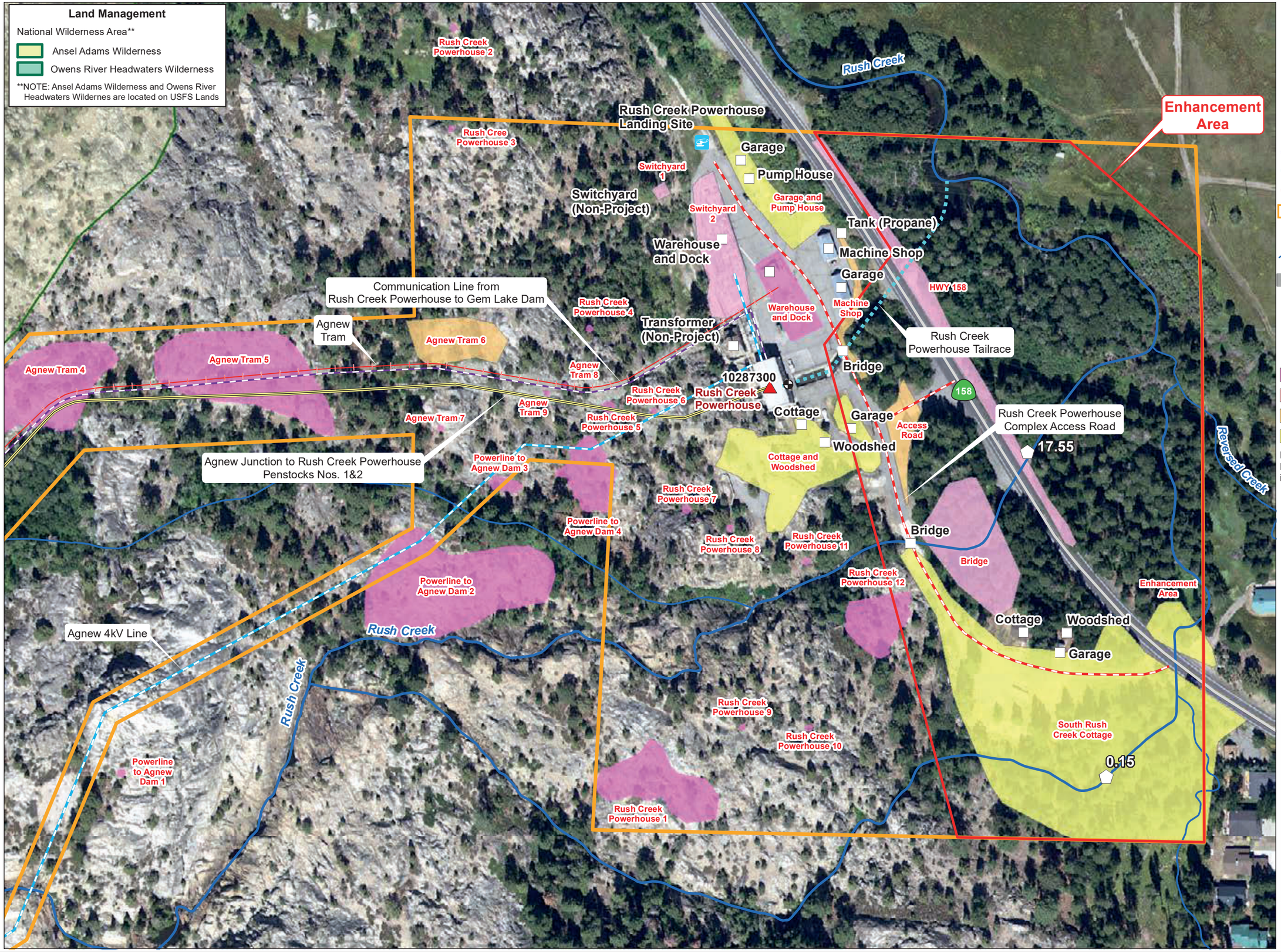
Date: 3/27/2024

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Silver Lake

Silver Lake Picnic Area

158

Rush Creek

17.05

SILVER LAKE HORSE TR

RUSH CREEK TR

SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- Non-Project Trail

General Sampling Locations

- Riparian Sampling Sites

Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

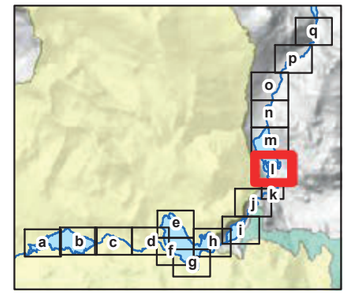
Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.

Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wildernes are located on USFS Lands



SOUTHERN CALIFORNIA EDISON
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Rush Creek Project (FERC 1389)

Map TERR 1-4I

Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity

0 50 100 200 Feet

Date: 3/27/2024

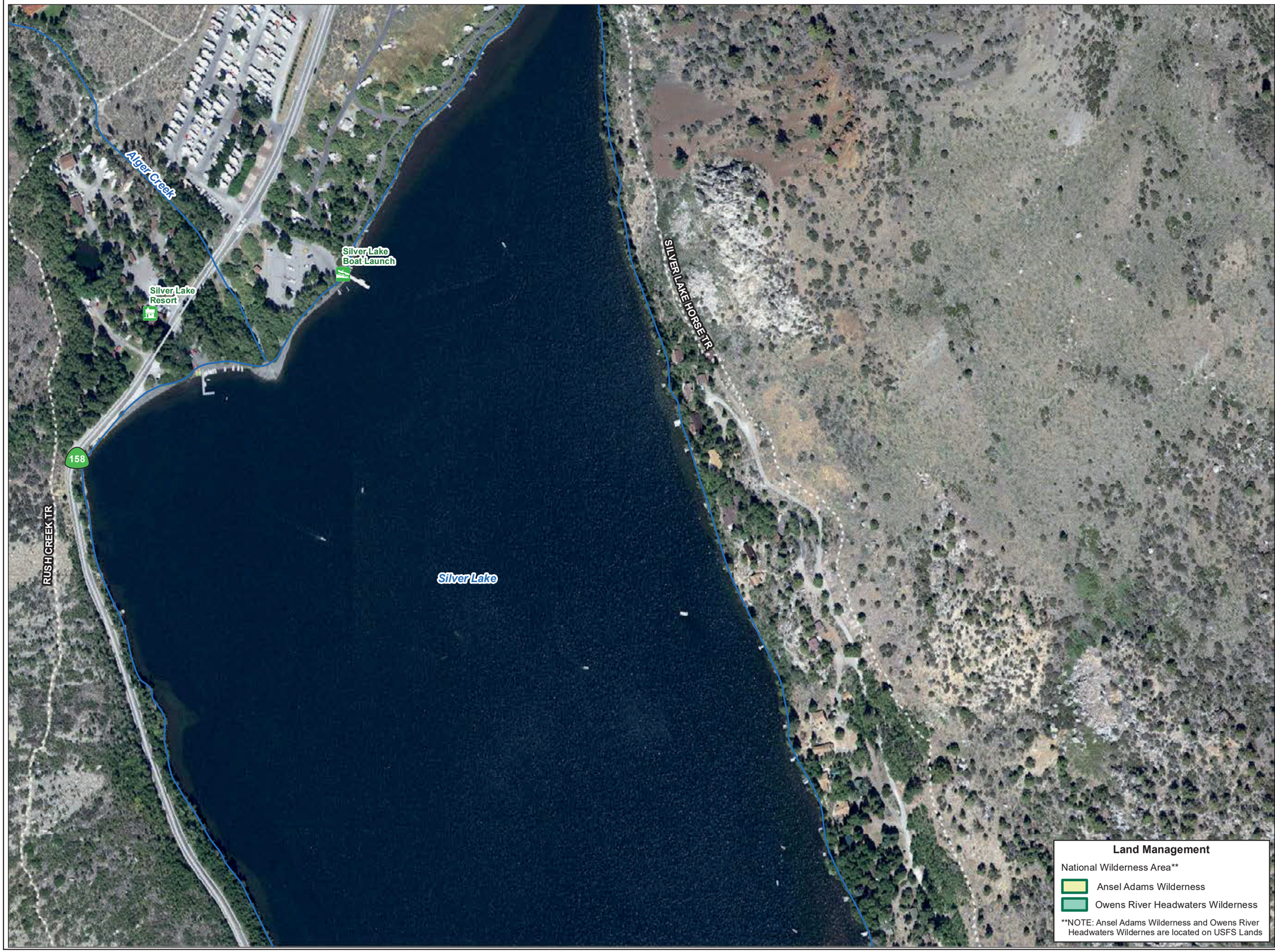
Projection: UTM Zone 11
Datum: NAD 83

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SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- Non-Project Trail

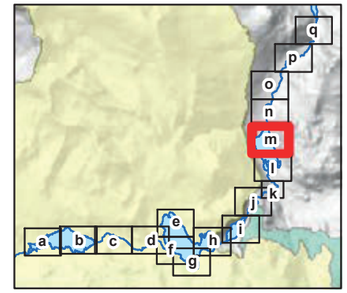
General Sampling Locations

- Riparian Sampling Sites

Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.



Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wildernes are located on USFS Lands

SOUTHERN CALIFORNIA EDISON
An EDISON INTERNATIONAL Company

Rush Creek Project (FERC 1389)

Map TERR 1-4m

Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity

0 50 100 200 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/27/2024

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SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- Non-Project Trail

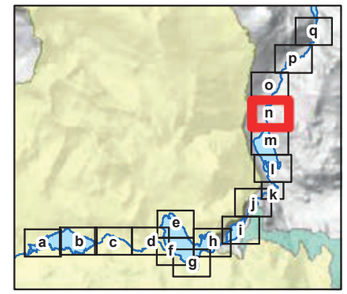
General Sampling Locations

- Riparian Sampling Sites

Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.



Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wildernes are located on USFS Lands

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Rush Creek Project (FERC 1389)

Map TERR 1-4n

Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity

0 50 100 200 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/27/2024

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SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- Non-Project Trail

General Sampling Locations

- Riparian Sampling Sites

Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

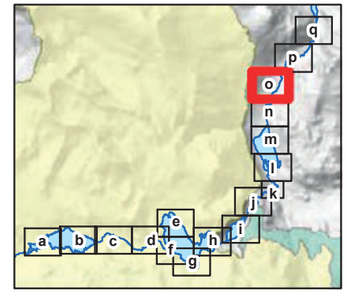
Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.

Land Management

National Wilderness Area**

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- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wildernes are located on USFS Lands



SOUTHERN CALIFORNIA EDISON
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Rush Creek Project (FERC 1389)

Map TERR 1-4o

Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity

0 50 100 200 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/27/2024

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Aerie Crag Picnic Area

158

Rush Creek

LOWER RUSH CREEK LOOP TR

SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- Non-Project Trail

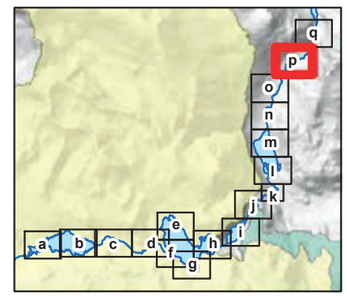
General Sampling Locations

- Riparian Sampling Sites

Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.



Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wildernes are located on USFS Lands

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Rush Creek Project (FERC 1389)

Map TERR 1-4p

Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity

N W E S

0 50 100 200 Feet

Date: 3/27/2024

Projection: UTM Zone 11
Datum: NAD 83

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Grant Lake

158

Rush Creek

SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- Non-Project Trail

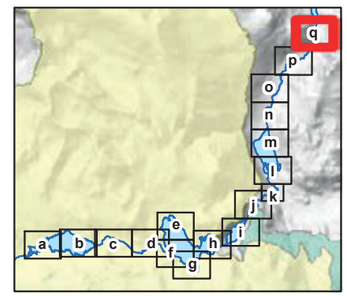
General Sampling Locations

- Riparian Sampling Sites

Non-Native Invasive Plants

- 1 Species Present
- 2-3 Species Present
- 4-5 Species Present
- 6+ Species Present

Population ID Example = "Gem Lake 1." Refer to Table 1-4 for more detailed information on each population.



Land Management

National Wilderness Area**

- Ansel Adams Wilderness
- Owens River Headwaters Wilderness

**NOTE: Ansel Adams Wilderness and Owens River Headwaters Wildernes are located on USFS Lands

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Rush Creek Project (FERC 1389)

Map TERR 1-4q

Non-Native Invasive Plant Species Occurring within the FERC Project Boundary and Vicinity

0 50 100 200 Feet

Projection: UTM Zone 11
Datum: NAD 83

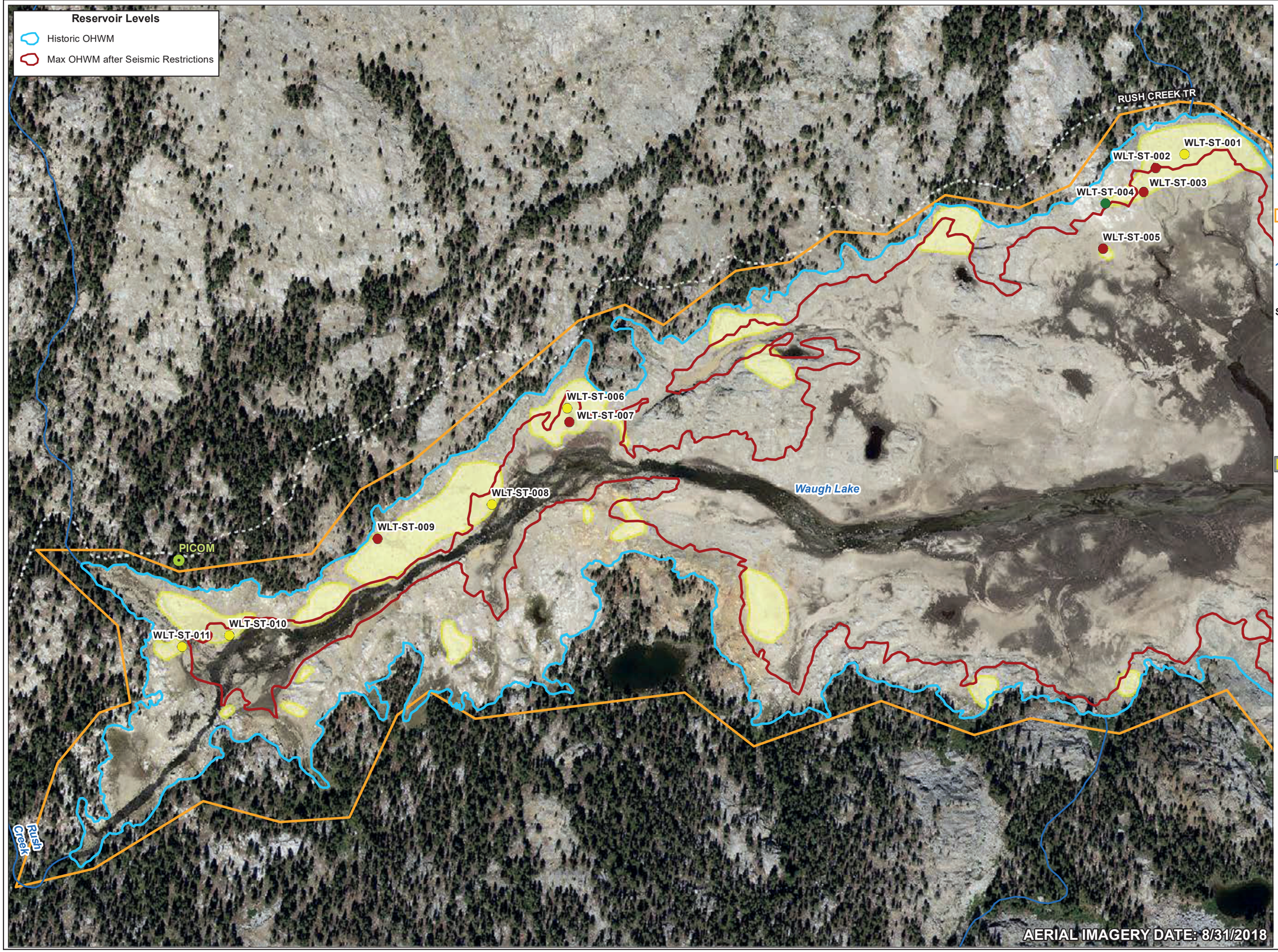
Date: 3/27/2024

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SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

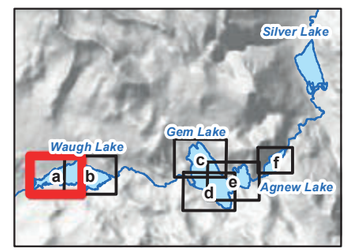
- Watercourse
- Non-Project Trail

Tree Stump Data

Stump Sampling Locations:

- Western juniper (Juniperus occidentalis)
- Lodgepole pine (Pinus contorta ssp. murrayana)
- Jeffrey pine (Pinus jeffreyi)
- Western white pine (Pinus monticola)
- Unknown pine species (Pinus spp.)
- Mountain hemlock (Tsuga mertensiana)
- Distribution of Tree Stumps*
- Live Tree Core Sampling Locations

* To be confirmed when LiDAR data is collected in 2024



SOUTHERN CALIFORNIA EDISON
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Rush Creek Project (FERC 1389)

Map TERR 1-5a

Location of Tree Stumps within Historical Reservoir Inundation Zones

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/20/2024

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Reservoir Levels

- Historic OHWM
- Max OHWM after Seismic Restrictions

WLT-ST-001
WLT-ST-002
WLT-ST-003
WLT-ST-004
WLT-ST-005
WLT-ST-012
WLT-ST-013
WLT-ST-014
WLT-ST-015
WLT-ST-016
WLT-ST-017
WLT-ST-018
TSME

RUSH CREEK TR
WEBER LAKE TR
Waugh Lake
Rush Creek
Rush Meadows Dam

AERIAL IMAGERY DATE: 8/31/2018

SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

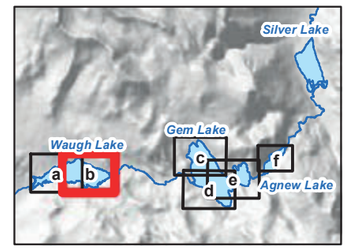
- Watercourse
- Non-Project Trail

Tree Stump Data

Stump Sampling Locations:

- Western juniper (Juniperus occidentalis)
- Lodgepole pine (Pinus contorta ssp. murrayana)
- Jeffrey pine (Pinus jeffreyi)
- Western white pine (Pinus monticola)
- Unknown pine species (Pinus spp.)
- Mountain hemlock (Tsuga mertensiana)
- Distribution of Tree Stumps*
- Live Tree Core Sampling Locations

* To be confirmed when LiDAR data is collected in 2024



SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map TERR 1-5b

Location of Tree Stumps within Historical Reservoir Inundation Zones

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

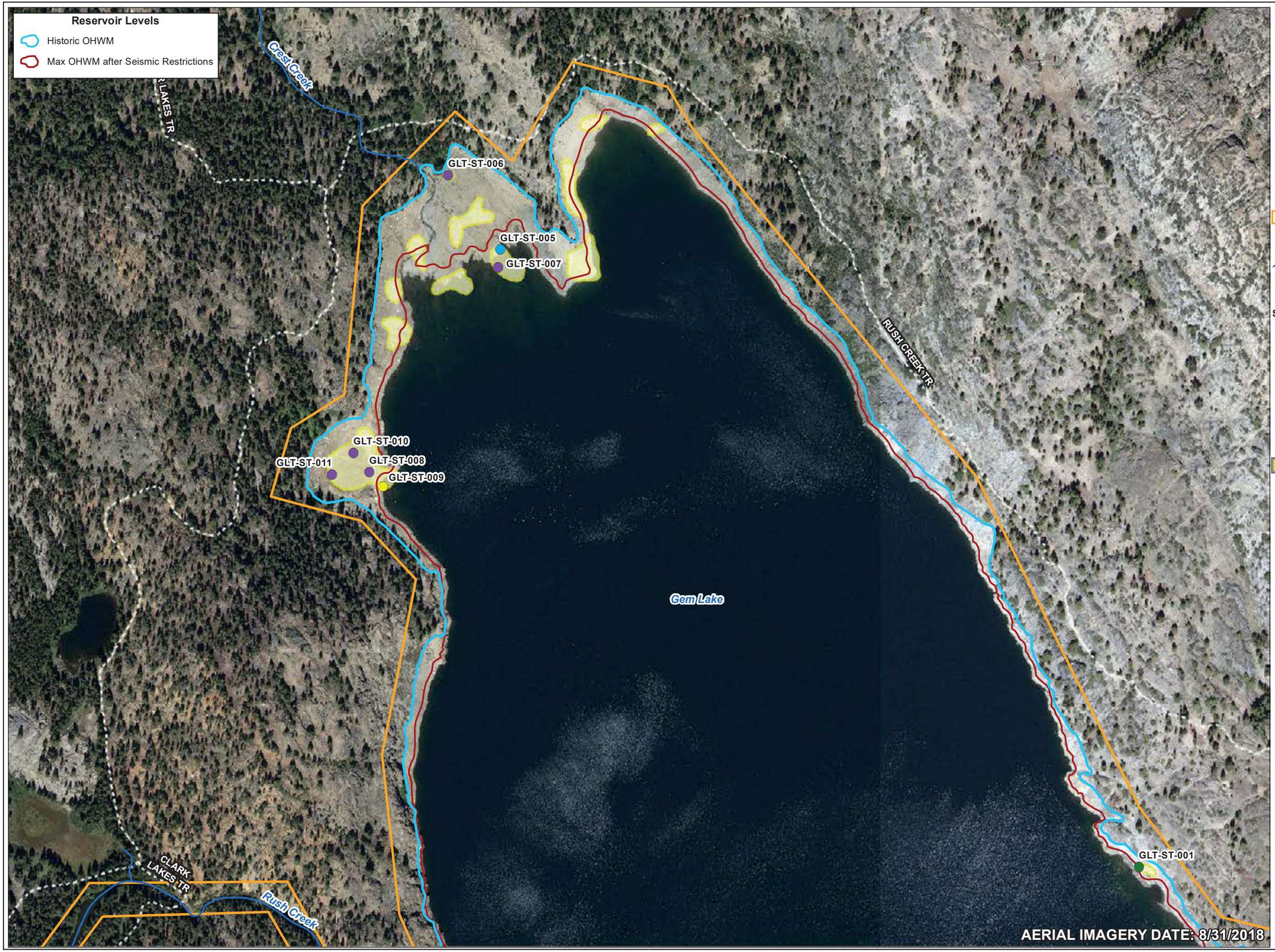
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SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

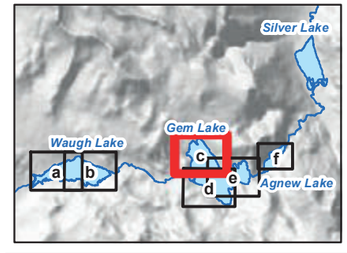
- Watercourse
- Non-Project Trail

Tree Stump Data

Stump Sampling Locations:

- Western juniper (Juniperus occidentalis)
- Lodgepole pine (Pinus contorta ssp. murrayana)
- Jeffrey pine (Pinus jeffreyi)
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- Unknown pine species (Pinus spp.)
- Mountain hemlock (Tsuga mertensiana)
- Distribution of Tree Stumps*
- Live Tree Core Sampling Locations

* To be confirmed when LiDAR data is collected in 2024



SOUTHERN CALIFORNIA EDISON
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Rush Creek Project (FERC 1389)

Map TERR 1-5c

Location of Tree Stumps within Historical Reservoir Inundation Zones

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/20/2024

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SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

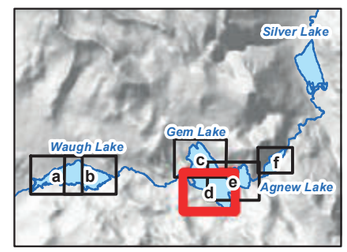
- Watercourse
- Non-Project Trail

Tree Stump Data

Stump Sampling Locations:

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- Lodgepole pine (Pinus contorta ssp. murrayana)
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- Western white pine (Pinus monticola)
- Unknown pine species (Pinus spp.)
- Mountain hemlock (Tsuga mertensiana)
- Distribution of Tree Stumps*
- Live Tree Core Sampling Locations

* To be confirmed when LiDAR data is collected in 2024



SOUTHERN CALIFORNIA EDISON
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Rush Creek Project (FERC 1389)

Map TERR 1-5d

Location of Tree Stumps within Historical Reservoir Inundation Zones

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

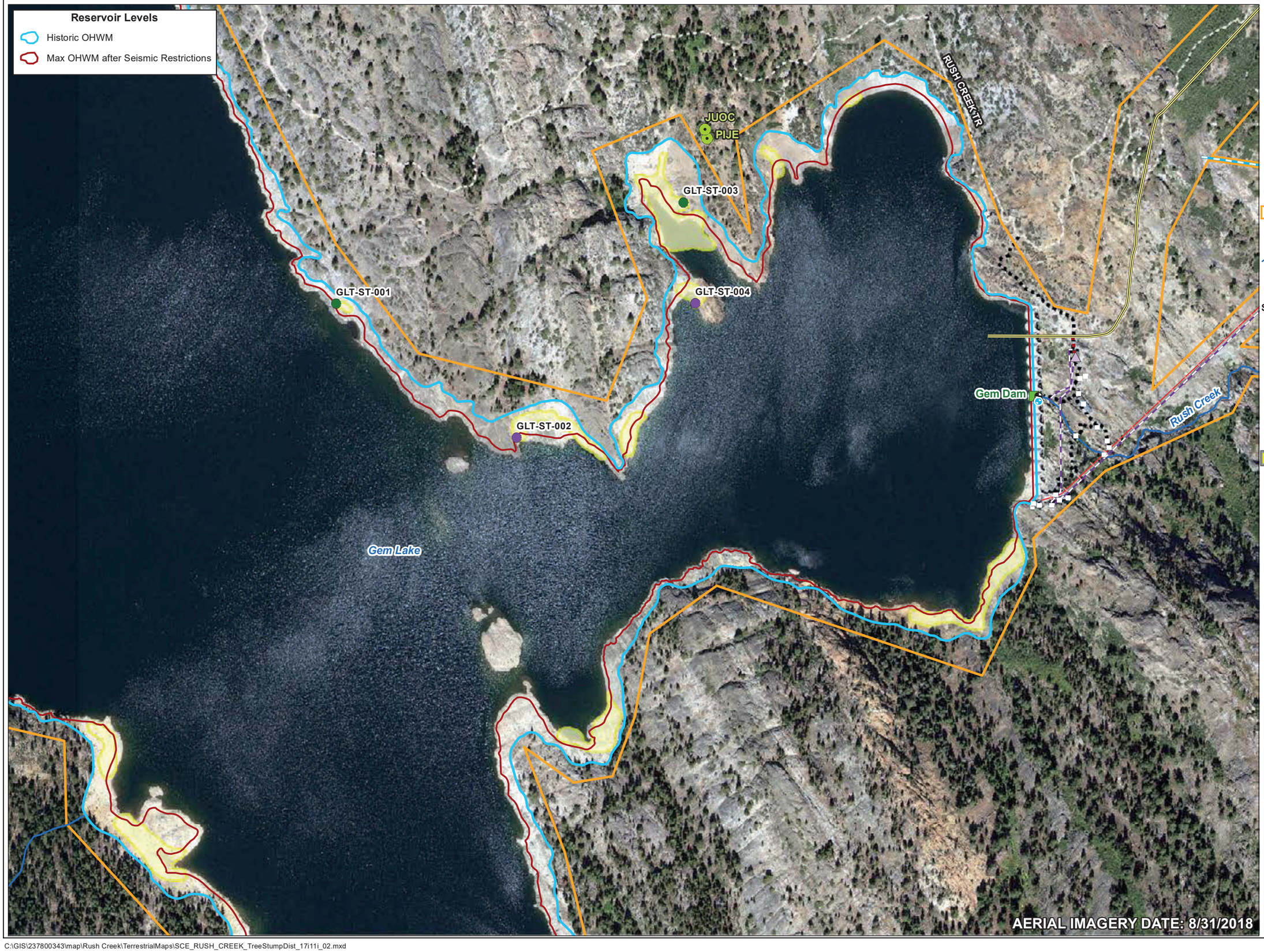
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SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

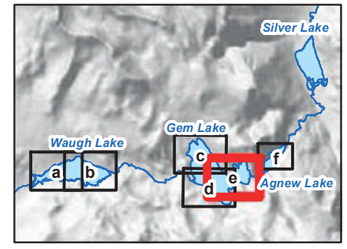
- Watercourse
- Non-Project Trail

Tree Stump Data

Stump Sampling Locations:

- Western juniper (Juniperus occidentalis)
- Lodgepole pine (Pinus contorta ssp. murrayana)
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- Western white pine (Pinus monticola)
- Unknown pine species (Pinus spp.)
- Mountain hemlock (Tsuga mertensiana)
- Distribution of Tree Stumps*
- Live Tree Core Sampling Locations

* To be confirmed when LiDAR data is collected in 2024



SOUTHERN CALIFORNIA EDISON
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Rush Creek Project (FERC 1389)

Map TERR 1-5e

Location of Tree Stumps within Historical Reservoir Inundation Zones

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

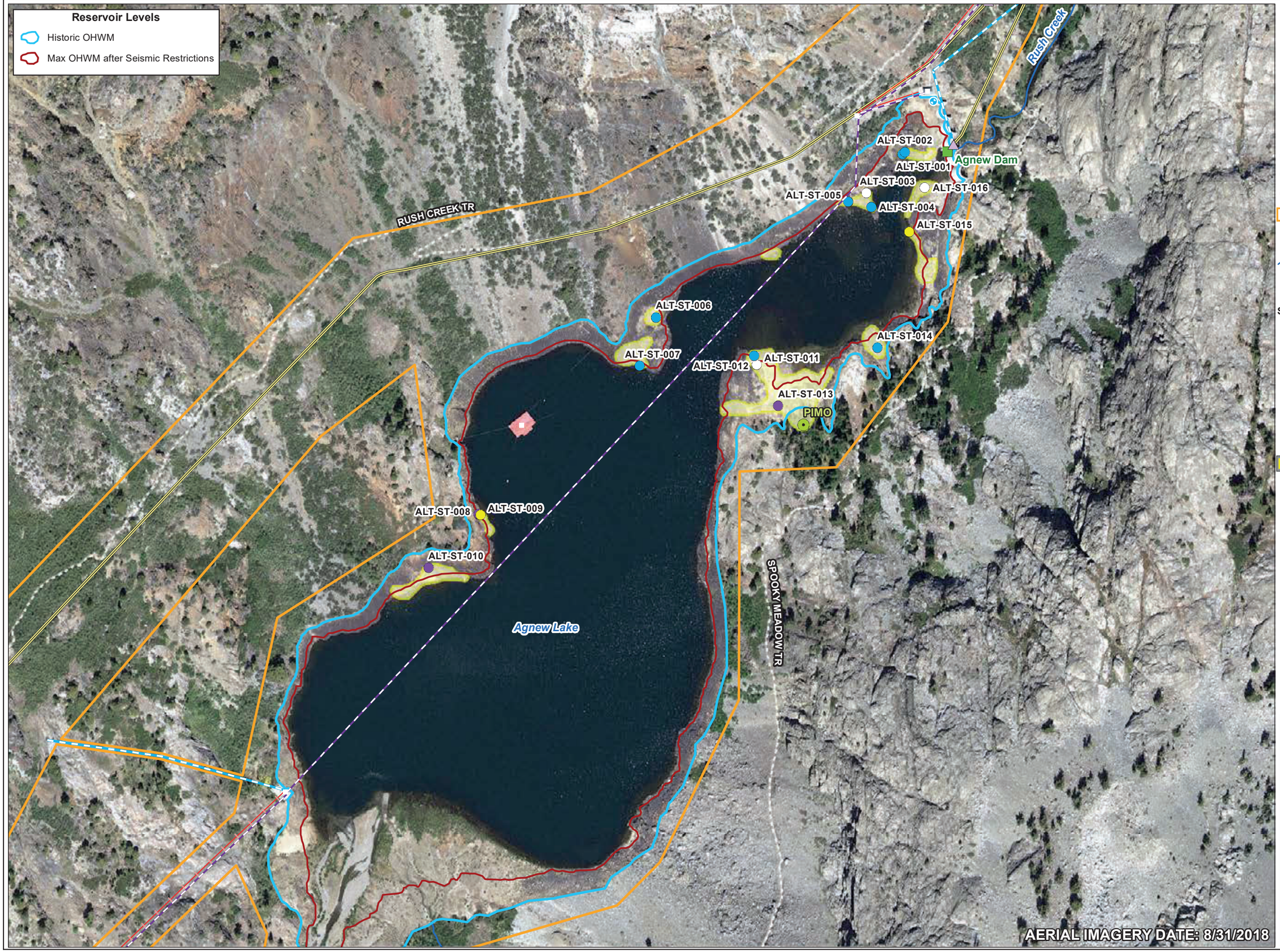
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SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
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- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

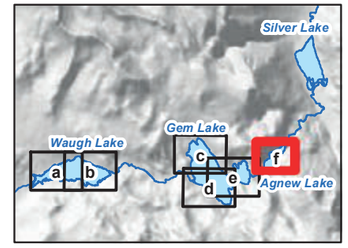
- Watercourse
- Non-Project Trail

Tree Stump Data

Stump Sampling Locations:

- Western juniper (Juniperus occidentalis)
- Lodgepole pine (Pinus contorta ssp. murrayana)
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- Western white pine (Pinus monticola)
- Unknown pine species (Pinus spp.)
- Mountain hemlock (Tsuga mertensiana)
- Distribution of Tree Stumps*
- Live Tree Core Sampling Locations

* To be confirmed when LiDAR data is collected in 2024



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Rush Creek Project (FERC 1389)

Map TERR 1-5f

Location of Tree Stumps within Historical Reservoir Inundation Zones

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

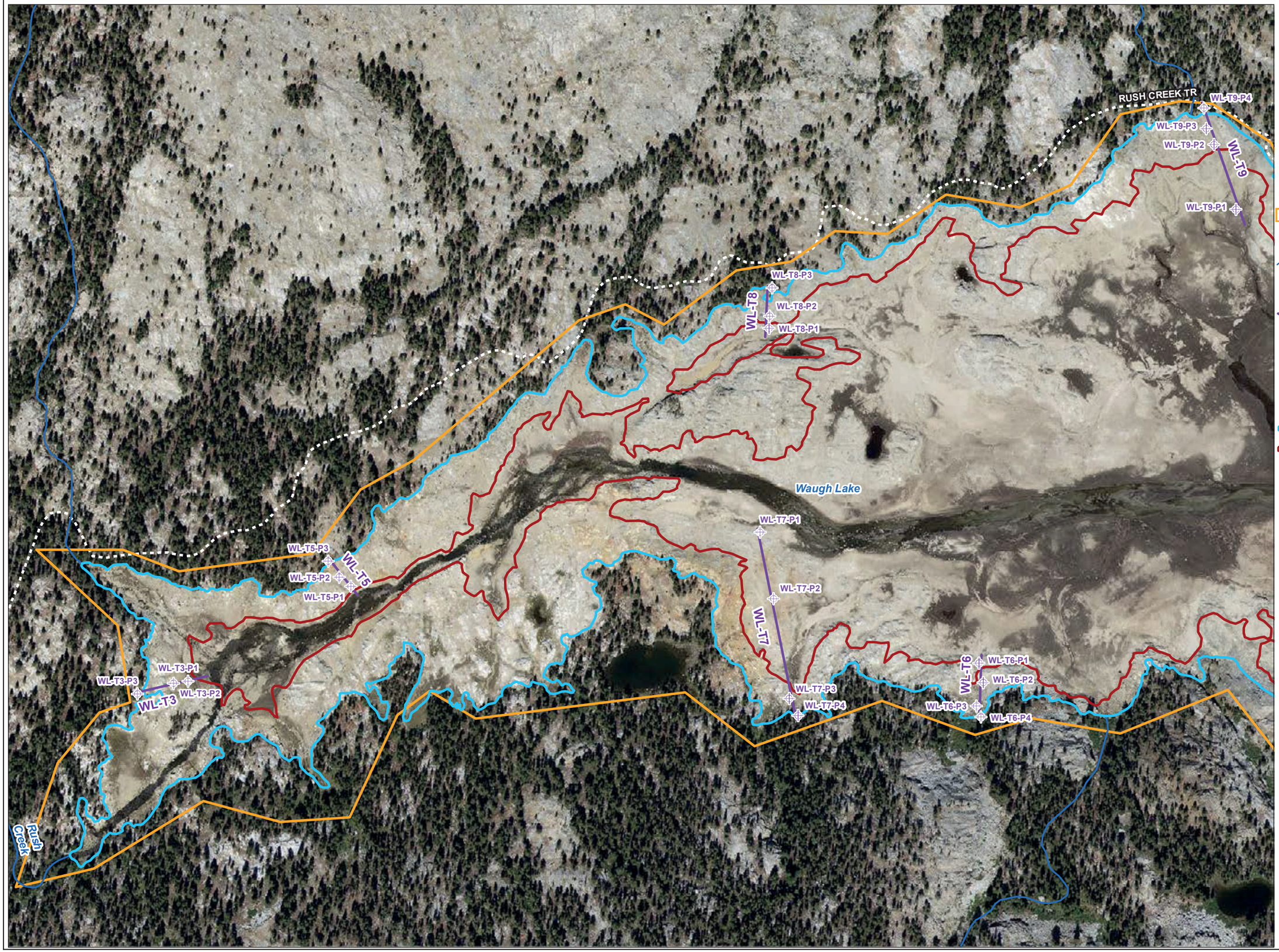
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SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Non-Project Trail

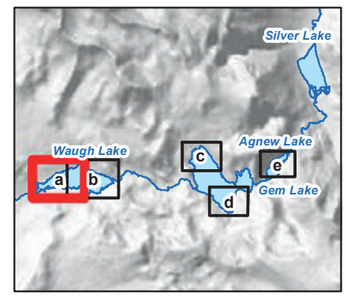
Transects / Sampling Plots

- Transect
- Sampling Plot Location

WL= Waugh Lake
GL = Gem Lake
AL = Agnew Lake

Reservoir Levels

- Historic OHWM
- Max OHWM after Seismic Restrictions



SOUTHERN CALIFORNIA EDISON®
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Rush Creek Project (FERC 1389)

Map TERR 1-6a

Transect and Sampling Plot Locations for Existing Botanical Resources within Historical Reservoir Inundation Zones

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/13/2024

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RUSH CREEK TR
WL-T9-P4
WL-T9-P3
WL-T9-P2
WL-T9
WL-T9-P1
Waugh Lake
Rush Meadows Dam
Rush Creek
WL-T1-P1
WL-T1-P2
WL-T1-P3
WL-T1-P4
WL-T1
WL-T6-P1
WL-T6-P2
WL-T6-P3
WL-T6-P4
WL-T6
WEBER LAKE TR
WL-T4-P1
WL-T4-P2
WL-T4-P3
WL-T4
WL-T2-P1
WL-T2-P2
WL-T2-P3
WL-T2

SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Non-Project Trail

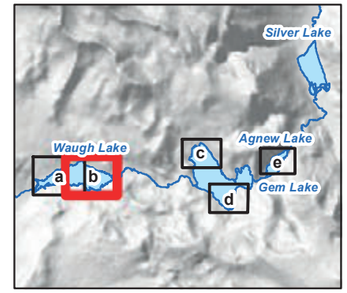
Transects / Sampling Plots

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Reservoir Levels

- Historic OHWM
- Max OHWM after Seismic Restrictions



SOUTHERN CALIFORNIA EDISON
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Rush Creek Project (FERC 1389)

Map TERR 1-6b

Transect and Sampling Plot Locations for Existing Botanical Resources within Historical Reservoir Inundation Zones

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/13/2024

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SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Non-Project Trail

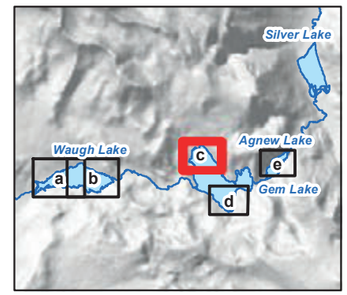
Transects / Sampling Plots

- Transect
- Sampling Plot Location

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Reservoir Levels

- Historic OHWM
- Max OHWM after Seismic Restrictions



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Rush Creek Project (FERC 1389)

Map TERR 1-6c

Transect and Sampling Plot Locations for Existing Botanical Resources within Historical Reservoir Inundation Zones

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/13/2024

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SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Non-Project Trail

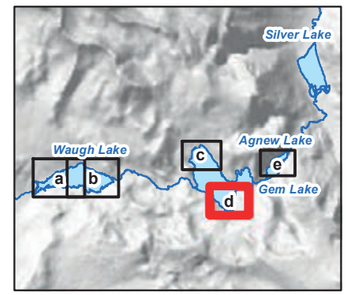
Transects / Sampling Plots

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- Sampling Plot Location

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Reservoir Levels

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- Max OHWM after Seismic Restrictions



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Rush Creek Project (FERC 1389)

Map TERR 1-6d

Transect and Sampling Plot Locations for Existing Botanical Resources within Historical Reservoir Inundation Zones

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

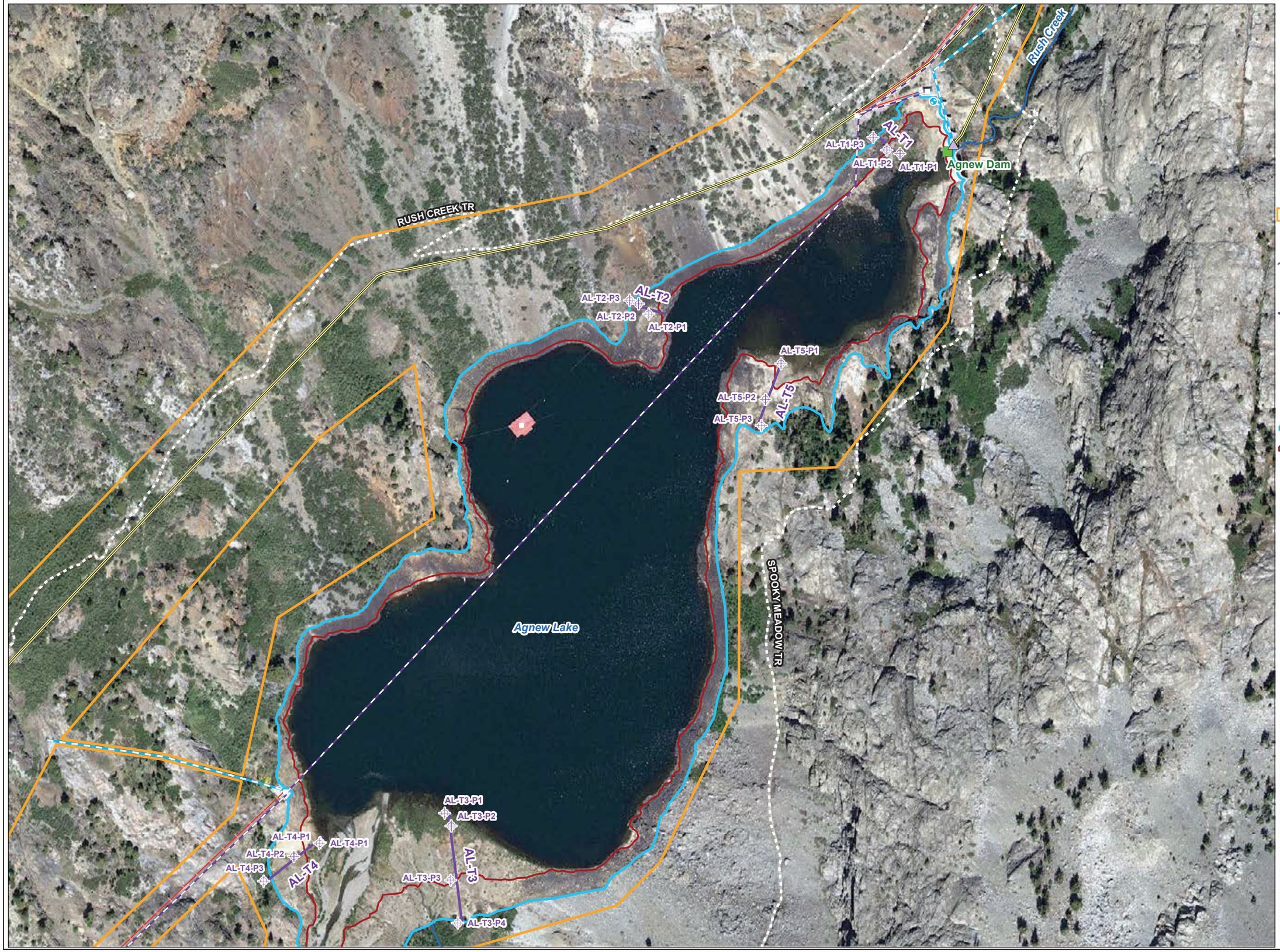
Date: 3/13/2024

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SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Tramway
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Non-Project Trail

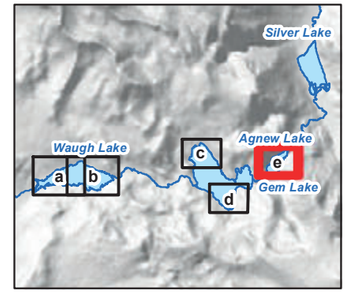
Transects / Sampling Plots

- Transect
- Sampling Plot Location

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Reservoir Levels

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- Max OHWM after Seismic Restrictions



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Rush Creek Project (FERC 1389)

Map TERR 1-6e

Transect and Sampling Plot Locations for Existing Botanical Resources within Historical Reservoir Inundation Zones

0 125 250 Feet

Projection: UTM Zone 11
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RUSH CREEK TR

WL2-001

WL R2

WL2-002

WL3-002

WL R3

WL3-001

WL4-002

WL4-001

WL R4

WL4-003

Waugh Lake

23

23.1

23.2

23.3

23.4

23.5

23.6

23.7

23.8

Rush Creek

NOTE: Plots were taken at the 2023 water elevations of Waugh Lake; water levels were much lower when transects were established in 2022

SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

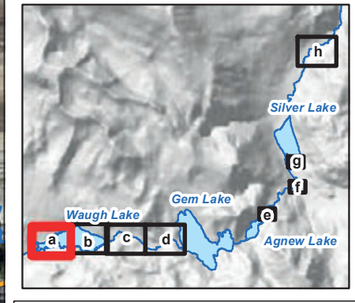
- Watercourse
- Water Body
- Non-Project Trail
- River Mile / 10th Mile

Transects / Sampling Plots

- Transect
- Sampling Plot Location

Transect Abbreviations

WL = Waugh Lake
RCBAD = Rush Creek below Agnew Dam
RCASL = Rush Creek above Silver Lake (RM 17.55)
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Rush Creek Project (FERC 1389)

Map TERR 1-7a

Riparian Sampling Sites, Transects, and Sampling Plots along Waugh Lake and Selected Project-affected Stream Segments

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/20/2024

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RUSH CREEK TR

WL1-001

23

22.9

22.8

Waugh Lake

WL R1

22.7

22.6

WL1-002

22.4

22.5

22.3

Rush Meadows Dam

Rush Creek

22.2

WEBER LAKE TR

NOTE: Plots were taken at the 2023 water elevations of Waugh Lake; water levels were much lower when transects were established in 2022

SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

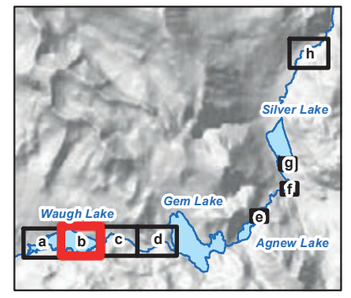
- Watercourse
- Water Body
- Non-Project Trail
- River Mile / 10th Mile

Transects / Sampling Plots

- Transect
- Sampling Plot Location

Transect Abbreviations

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SOUTHERN CALIFORNIA EDISON
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Rush Creek Project (FERC 1389)

Map TERR 1-7b

Riparian Sampling Sites, Transects, and Sampling Plots along Waugh Lake and Selected Project-affected Stream Segments

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/20/2024

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Previous Riparian Studies: Rush Creek below Rush Meadows Dam*

Previous Long-term Riparian Monitoring Sites (Psomas 2000, Psomas 2004, Read 2010, Read and Salamunovich 2019, E. Read and Associates Inc 2023)

*NOTE: Long-Term Riparian Sites have three transects at Sites 1 and 2, and a photo-monitoring station at Site 3

Rush Creek
RUSH CREEK TR
Frontier Pack Station Camp Pack Station
Waugh Lake
WEBER LAKE TR
21.9
21.8
21.7
21.6
21.5
21.4
21.3
22
22.2
22.1
1
2

SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

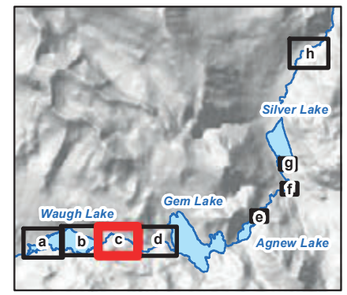
- Watercourse
- Water Body
- Non-Project Trail
- River Mile / 10th Mile

Transects / Sampling Plots

- Transect
- Sampling Plot Location

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Rush Creek Project (FERC 1389)

Map TERR 1-7c

Riparian Sampling Sites, Transects, and Sampling Plots along Waugh Lake and Selected Project-affected Stream Segments

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

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*NOTE: Long-Term Riparian Sites have three transects at Sites 1 and 2, and a photo-monitoring station at Site 3

RUSH CREEK TR

Billy Lake Stock Camp Pack Station

Rush Creek

CLARK LAKES TR

Gem Lake

20.9 20.8 20.7 20.6 20.5 20.4

21.3 21.2 21.1

3 21

SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

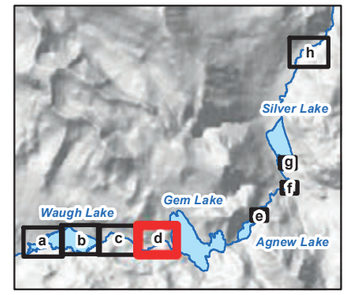
- Watercourse
- Water Body
- Non-Project Trail
- River Mile / 10th Mile

Transects / Sampling Plots

- Transect
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Rush Creek Project (FERC 1389)

Map TERR 1-7d

Riparian Sampling Sites, Transects, and Sampling Plots along Waugh Lake and Selected Project-affected Stream Segments

0 125 250 Feet

Projection: UTM Zone 11
Datum: NAD 83

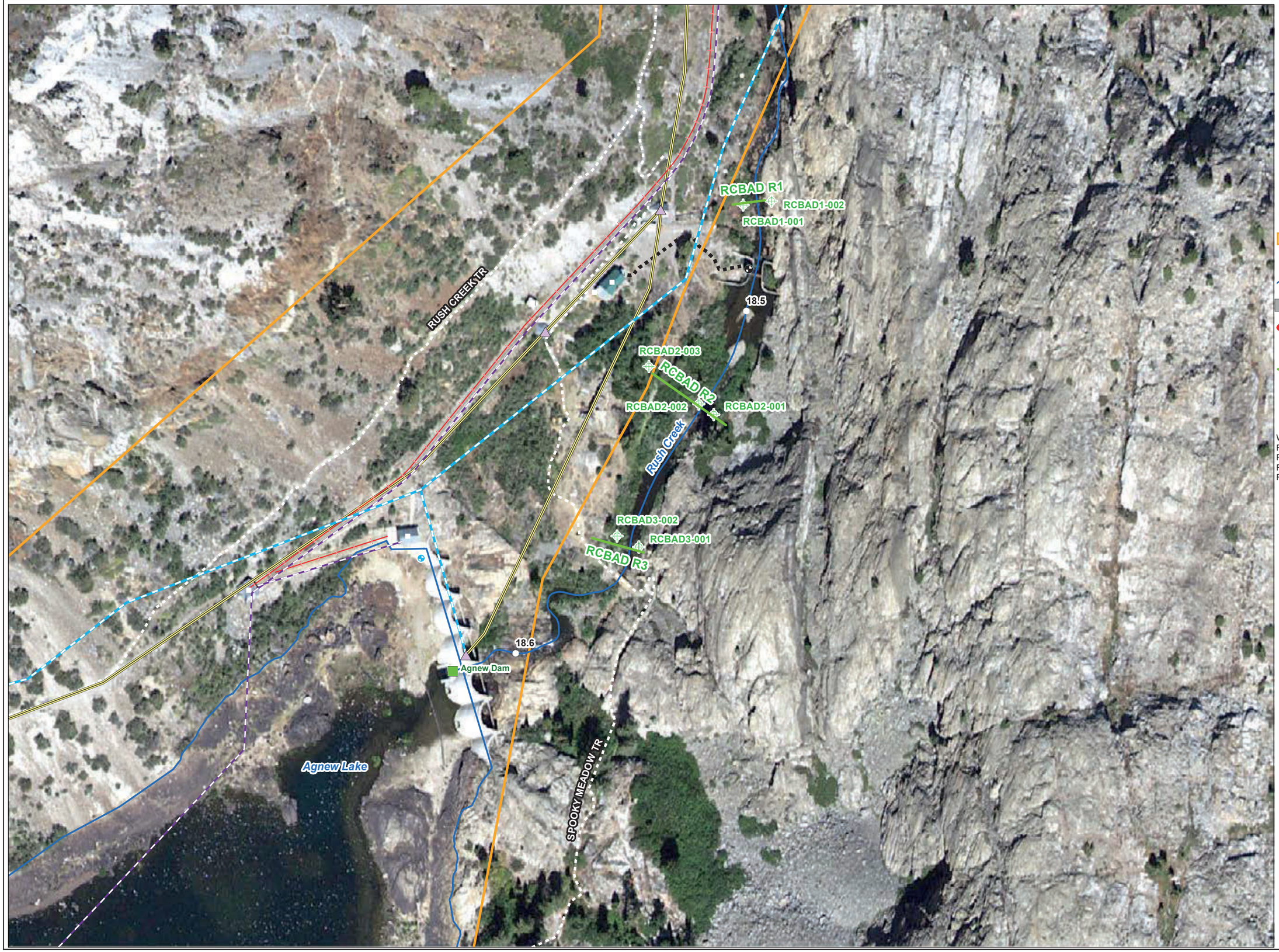
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SCE Facilities

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- Reservoir Gage
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Other Features

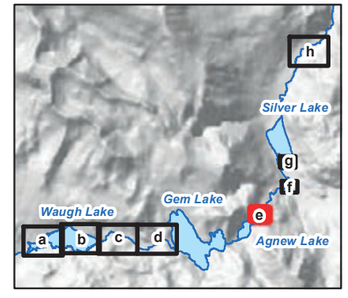
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Rush Creek Project (FERC 1389)

Map TERR 1-7e

Riparian Sampling Sites, Transects, and Sampling Plots along Waugh Lake and Selected Project-affected Stream Segments

0 50 100 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/20/2024

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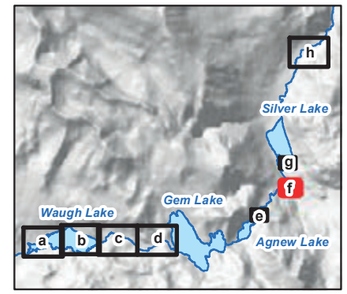
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- Water Body
- Non-Project Trail
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Rush Creek Project (FERC 1389)

Map TERR 1-7f

Riparian Sampling Sites, Transects, and Sampling Plots along Waugh Lake and Selected Project-affected Stream Segments

0 50 100 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/20/2024

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SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

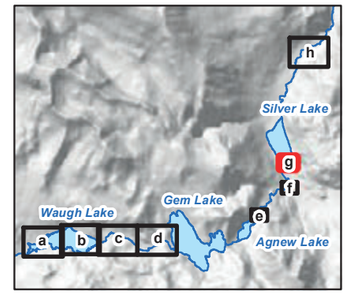
- Watercourse
- Water Body
- Non-Project Trail
- River Mile / 10th Mile

Transects / Sampling Plots

- Transect
- Sampling Plot Location

Transect Abbreviations

WL = Waugh Lake
RCBAD = Rush Creek below Agnew Dam
RCASL = Rush Creek above Silver Lake (RM 17.55)
RCASLM = Rush Creek above Silver Lake (RM 17.05)
RCBSL = Rush Creek below Silver Lake



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Rush Creek Project (FERC 1389)

Map TERR 1-7g

Riparian Sampling Sites, Transects, and Sampling Plots along Waugh Lake and Selected Project-affected Stream Segments

0 50 100 Feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 3/20/2024

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Aerie Crag Picnic Area
RCBSL1-002
13.9
RCBSL1-001
RCBSL1-003
RCBSL R1
14
14.1
Rush Creek
14.2
RCBSL2-001
RCBSL R2
RCBSL2-002
RCBSL2-003
158
14.3
14.4
14.5
14.6
LOWER RUSH CREEK LOOP TR
14.7
RCBSL3-001
RCBSL R3
RCBSL3-003
RCBSL3-004
RCBSL3-002

SCE Facilities

- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Tunnel
- Flowline / Penstock
- Power Line
- Comm Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

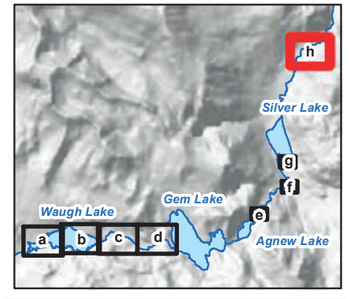
- Watercourse
- Water Body
- Non-Project Trail
- River Mile / 10th Mile

Transects / Sampling Plots

- Transect
- Sampling Plot Location

Transect Abbreviations

WL = Waugh Lake
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SOUTHERN CALIFORNIA EDISON
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Rush Creek Project (FERC 1389)

Map TERR 1-7h

Riparian Sampling Sites, Transects, and Sampling Plots along Waugh Lake and Selected Project-affected Stream Segments

0 125 250 Feet

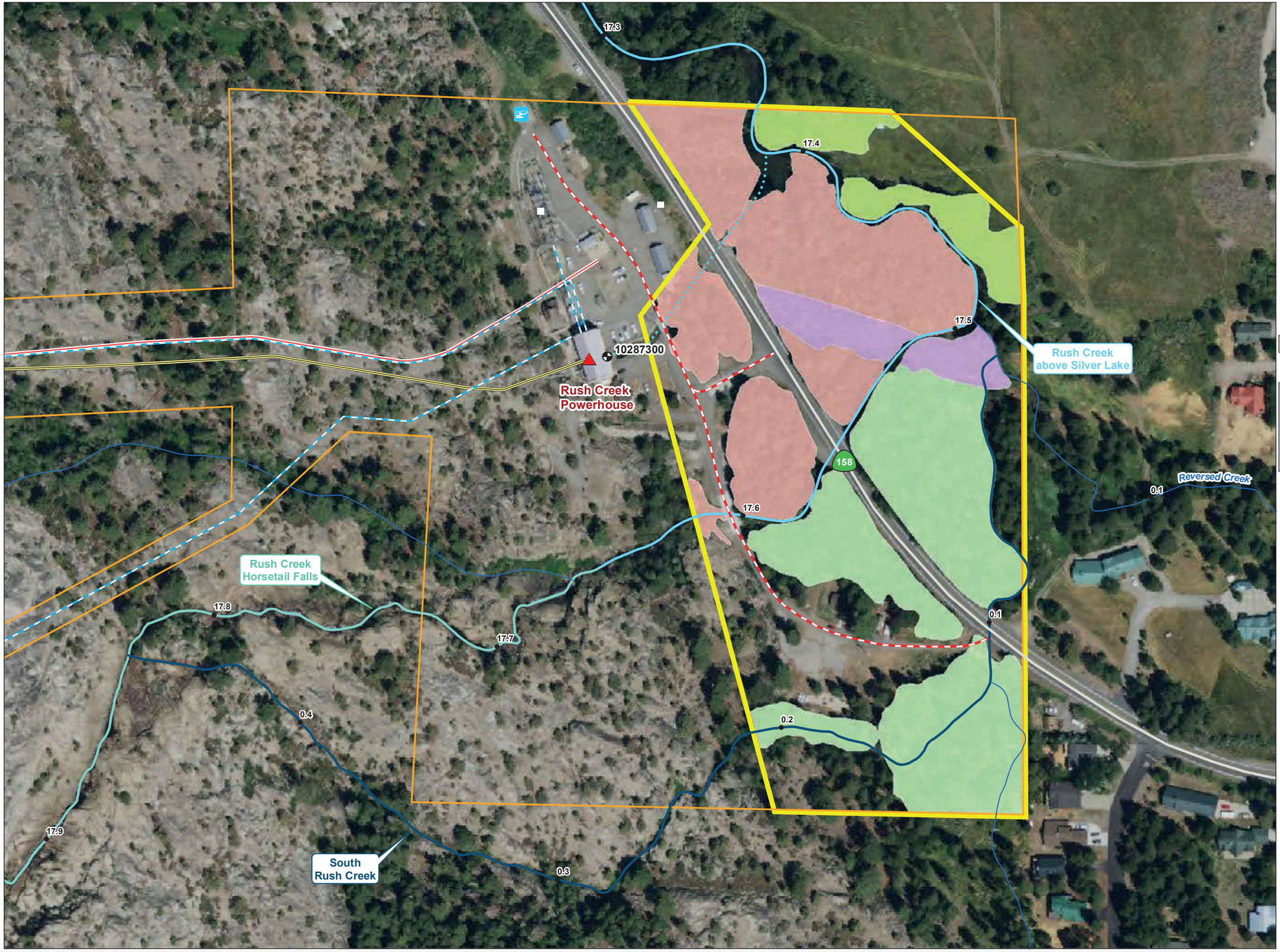
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Date: 3/20/2024

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SCE Facilities

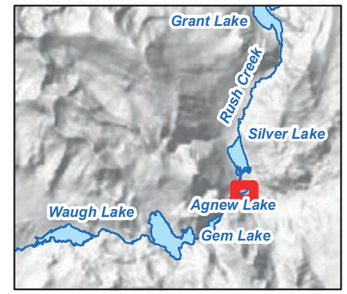
- Powerhouse
- Dam
- Stream Gage
- Reservoir Gage
- Ancillary Facility
- Helicopter Landing Site
- Water Conveyance Feature
- Tailrace
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- Project Trail
- FERC Project Boundary

Other Features

- Watercourse
- Water Body
- River Mile / 10th Mile
- Potential Enhancement Area

Riparian Alliances

- Pinus contorta ssp. murrayana Forest Alliance
- Populus tremuloides Forest Alliance
- Populus tremuloides Shrubland Alliance
- Salix boothii – Salix geyeriana – Salix lutea Shrubland Alliance



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Rush Creek Project (FERC 1389)

Map TERR 1-8

Riparian Vegetation Alliances in the Potential Enhancement Area

0 50 100 Feet

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Datum: NAD 83

Date: 3/13/2024

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APPENDIX A

Aquatic Resources Delineation Report for the Rush Creek Project Enhancement Area

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Southern California Edison
Rush Creek Hydroelectric Project
(FERC Project No. 1389)

Appendix A

Aquatic Resources Delineation Report for the Rush Creek Project Potential Enhancement Area



Southern California Edison
Regulatory Support Services
2244 Walnut Grove Avenue, Rosemead, CA 91770

EXECUTIVE SUMMARY

This report documents the results of an aquatic resources delineation conducted on behalf of the Southern California Edison Company in support of the potential enhancement area for the Rush Creek Hydroelectric Project (Federal Energy Regulatory Commission [FERC] Project No. 1389), located within the community of June Lake in Mono County, California.

The delineation was conducted in accordance with the 1987 Corps of Engineers Wetlands Delineation Manual (U.S. Army Corps of Engineers [USACE] 1987); the Regional Supplement to the Corps Wetland Delineation Manual: Arid West Region, Version 2.0 (USACE 2008); A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (Lichvar and McColley 2008); and Regulatory Guidance Letter No. 05-05 (USACE 2005). The USACE is ultimately responsible for determining the limits of their jurisdiction, and this report has been prepared to assist the USACE with their determination.

The 14.23-acre Study Area includes the lands within the FERC Project Boundary in the vicinity of the Rush Creek Powerhouse along both sides of State Route 158 (i.e., the potential enhancement area). Aquatic resources identified in the Study Area included seven perennial streams; two intermittent streams; 17 palustrine forested wetlands; three palustrine scrub shrub wetlands; and three palustrine emergent wetlands. Refer to **Table ES-1**, below, for a summary of each of these features.

Table ES-1. Aquatic Resources Identified in the Study Area.

Aquatic Resources	Map ID	Size of Resources Within Study Area	Location of Feature (Latitude/Longitude)
Riverine, Perennial (Cowardin Type R2UB)			
Rush Creek Powerhouse Tailrace	TR	345 linear feet	37.766633/-119.122521
Rush Creek above Silver Lake	RC	1,285 linear feet	37.765703/-119.121769
Reversed Creek	REVCRK	135 linear feet	37.766396/-119.120638
South Rush Creek Segment B	SRC_B	170 linear feet	37.765283/-119.120562
South Rush Creek Segment C	SRC_C	444 linear feet	37.765602/-119.120715
Perennial Stream 1 Segment A	PS_01A	102 linear feet	37.764391/-119.120511
Perennial Stream 1 Segment B	PS_01B	106 linear feet	37.764732/-119.120489
Riverine, Intermittent (Cowardin Type R4SB)			
South Rush Creek Segment A	SRC_A	497 linear feet	37.764657/-119.121655
Intermittent Stream 1	IS_01	75 linear feet	37.764349/-119.121113
Palustrine Forested Wetlands (Cowardin Type PFO)			
Palustrine Forested Wetland 1	PFO_01	0.065 acre	37.765730/-119.121794
Palustrine Forested Wetland 2	PFO_02	0.022 acre	37.765670/-119.121546
Palustrine Forested Wetland 3	PFO_03	0.043 acre	37.765522/-119.121835
Palustrine Forested Wetland 4	PFO_04	0.083 acre	37.764800/-119.120862
Palustrine Forested Wetland 5	PFO_05	0.670 acre	37.764518/-119.120764
Palustrine Forested Wetland 6	PFO_06	0.028 acre	37.764847/-119.120493

Table ES-1. Aquatic Resources Identified in the Study Area.

Aquatic Resources	Map ID	Size of Resources Within Study Area	Location of Feature (Latitude/Longitude)
Palustrine Forested Wetland 7	PFO_07	0.002 acre	37.764491/-119.120456
Palustrine Forested Wetland 8	PFO_08	0.029 acre	37.764344/-119.120487
Palustrine Forested Wetland 9	PFO_09	0.111 acre	37.766515/-119.122326
Palustrine Forested Wetland 10	PFO_10	0.389 acre	37.767318/-119.122431
Palustrine Forested Wetland 11	PFO_11	0.082 acre	37.766969/-119.121851
Palustrine Forested Wetland 12	PFO_12	0.135 acre	37.766890/-119.121540
Palustrine Forested Wetland 13	PFO_13	0.179 acre	37.766760/-119.120967
Palustrine Forested Wetland 14	PFO_14	0.220 acre	37.767439/-119.121755
Palustrine Forested Wetland 15	PFO_15	0.502 acre	37.766965/-119.120900
Palustrine Forested Wetland 16	PFO_16	1.086 acres	37.765824/-119.120967
Palustrine Forested Wetland 17	PFO_17	0.030 acre	37.765257/-119.120542
Palustrine Scrub Shrub Wetlands (Cowardin Type PSS)			
Palustrine Scrub Shrub Wetland 1	PSS_01	0.379 acre	37.766533/-119.121645
Palustrine Scrub Shrub Wetland 2	PSS_02	0.044 acre	37.766295/-119.120624
Palustrine Scrub Shrub Wetland 3	PSS_03	0.280 acre	37.766383/-119.120923
Palustrine Emergent Wetlands (Cowardin Type PEM)			
Palustrine Emergent Wetland 1	PEM_01	0.009 acre	37.765900/-119.121735
Palustrine Emergent Wetland 2	PEM_02	0.340 acre	37.767286/-119.121240
Palustrine Emergent Wetland 3	PEM_03	0.024 acre	37.766389/-119.120563

Table of Contents

1. INTRODUCTION 1
2. LOCATION 1
2.1 Access to the Study Area 2
3. METHODS 2
3.1 Preliminary Data Gathering 2
3.2 Field Delineation of Aquatic Resources 2
3.2.1 Identification of Ordinary High Water Mark 3
3.2.2 Identification of Wetlands 3
4. RESULTS 5
4.1 Landscape Setting 5
4.1.1 Soils 6
4.1.2 Regional and Local Hydrology 6
4.1.3 Vegetation Communities 8
4.2 Aquatic Resources 8
4.2.1 Perennial Streams (Riverine, Perennial) 10
4.2.2 Intermittent Streams (Riverine, Intermittent) 13
4.2.3 Palustrine Forested Wetlands 13
4.2.4 Palustrine Scrub Shrub Wetlands 24
4.2.5 Palustrine Emergent Wetlands 27
5. REFERENCES 29

List of Tables

Table 1. Project Location Information.

Table 2. Aquatic Resources Identified in the Study Area.

Table 3. Summary of Perennial Streams Identified in the Study Area.

Table 4. Summary of Intermittent Streams Identified in the Study Area.

Table 5. Summary of Palustrine Forested Wetlands Identified in the Study Area.

Table 6. Summary of Palustrine Scrub Shrub Wetlands Identified in the Study Area.

Table 7. Summary of Palustrine Emergent Wetlands Identified in the Study Area.

List of Maps

Map 1. Study Area Location.

Map 2a. Aquatic Resources in the Rush Creek Project Potential Enhancement Area.

Map 2b. Aquatic Resources in the Rush Creek Project Potential Enhancement Area.

Map 3a. Aquatic Resource Photograph Locations.

Map 3b. Aquatic Resource Photograph Locations.

List of Appendices

Appendix A. Signed Statement from Southern California Edison Company Regarding Access.

Appendix B. Web Soil Survey Query Results.

Appendix C. National Wetlands Inventory Query Results.

Appendix D. WETS Tables for Lee Vining, CA.

Appendix E. Study Area Photographs.

Appendix F. Ordinary High Water Mark (OHWM) Delineation Datasheets.

Appendix G. Aquatic Resources Delineation Datasheets.

Appendix H. Wetland Indicator Status of Plant Species Observed in the Study Area.

Appendix I. Aquatic Resources Excel Sheet.

Appendix J. Culvert Information.

1. INTRODUCTION

This report documents the results of an aquatic resources delineation conducted on behalf of the Southern California Edison Company (SCE) as required by the TERR 1 – Botanical Resources Technical Study Plan (TERR 1 – TSP) for the Rush Creek Hydroelectric Project (FERC Project No. 1389) (Project). The TERR 1 – TSP required SCE to conduct an aquatic resources delineation within the potential enhancement area. The potential enhancement area includes portions of the Rush Creek and South Rush Creek channels upstream and downstream of the State Route 158 crossing. As part of the relicensing of the Rush Creek Hydroelectric Project, SCE is studying the potential enhancement area to evaluate conditions surrounding local flooding of residences during high flow events. The potential enhancement area is located near the Rush Creek Powerhouse along State Route 158 within the community of June Lake in Mono County, CA (**Map 1**). Land within the potential enhancement area is owned by SCE and adjacent private landowners.

The aquatic resources delineation will be included as an appendix in the TERR 1 – Botanical Resources Technical Study Report (TERR 1 – TSR), which will be distributed to stakeholders, and will be used to inform environmental analyses required as part of the Rush Creek Hydroelectric Project relicensing process.

2. LOCATION

The Study Area is defined as the potential enhancement area for the Rush Creek Hydroelectric Project. As part of the relicensing for the Rush Creek Hydroelectric Project, SCE is studying the potential enhancement area to evaluate conditions surrounding local flooding of residences during high flow events (e.g., the potential enhancement area). The potential enhancement area includes portions of the Rush Creek and South Rush Creek channels upstream and downstream of the State Route 158 crossing, within the FERC Project boundary.

The Study Area is in the Grant Lake-Rush Creek Watershed (Hydrologic Unit Code 180901010301) on private lands owned by SCE and other private landowners within the FERC Project boundary. The Study Area, which totals 14.23 acres, is located on both sides of State Route 158 near the Rush Creek Powerhouse area (**Map 1**).

Refer to **Table 1**, below for coordinates of the limits of each end of the Study Area.

Table 1. Project Location Information.

Component of Study Area	Latitude/ Longitude	USGS 7.5-Minute Quad	Township	Range	Section
Northwest Corner	37.367535/ -119.122804	June Lake	6S	26E	S33
Southeast Corner	37.764285/ -119.120438	June Lake	2S	26E	S21

From the town center of June Lake, continue southwest on State Route 158 (towards Silver Lake) for approximately 3.2 miles until you reach the turnout for SCE's Rush Creek Powerhouse. There is a locked gate on the powerhouse entrance, but parking is available in several turnouts along State Route 158. The Study Area is located on both sides of State Route 158 in the vicinity of the powerhouse.

2.1 Access to the Study Area

The Study Area is located on privately owned lands. Because portions of the Study Area are behind a locked gate and within a potentially hazardous powerhouse and switchyard complex, SCE requires advance notification to coordinate with other private landowners prior to a site visit. Please contact Matthew Woodhall at matthew.woodhall@sce.com to coordinate a site visit.

3. METHODS

Section 404 of the Clean Water Act (CWA) authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill material into the Waters of the U.S (WOUS). The term WOUS is broadly defined and includes both deep-water aquatic habitats including territorial seas, lakes, rivers, and streams, and “special aquatic sites” (e.g., wetlands, mudflats, and coral reefs).

The following steps were completed to delineate potential jurisdictional WOUS: preliminary data gathering, field surveys, and post-field data analysis/determination. These steps are described below.

3.1 Preliminary Data Gathering

The following resources were reviewed to obtain initial information on the landscape setting. Resources reviewed included information on soils; regional and local hydrology; and vegetation communities/wildlife habitats that characterize the Study Area:

- Rush Creek Hydroelectric Project, Pre-Application Document (PAD) (SCE 2021);
- TERR 1 – TSR (SCE 2024);
- U.S. Geological Survey (USGS) 7.5-minute June Lake Quadrangle Map (Mono County, California)
- National Resources Conservation Service (NRCS) Web Soil Survey (NRCS 2023)
- NRCS Official Soil Series Descriptions (NRCS 2023)
- NRCS National Hydric Soils List for California (NRCS 2023)
- NRCS National Water and Climate Center Climate Analysis for Wetlands Tables (WETS Tables) (NRCS 2024)
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) Online Wetlands Mapper (USFWS 2023)

3.2 Field Delineation of Aquatic Resources

Field surveys to characterize and determine the extent of WOUS were conducted on October 4 – 7, 2023. Field surveys were conducted in the fall because 2023 was an unusually wet spring and fall and flows out of Rush Creek and the Rush Creek powerhouse were at record levels well into the spring and summer. Flows did not return to more normal levels until later in the fall.

The aquatic resources delineation described in this report was conducted in accordance with the guidelines and methods provided in the Corps of Engineers Wetlands Delineation Manual (Manual) (Environmental Laboratory 1987); the Regional Supplement to the Corps of Engineers

Wetland Delineation Manual: Arid West Region (U.S. Army Corps of Engineers [USACE] 2008); and A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (Lichvar and McColley 2008). Information regarding the OHWM of streams was recorded on the Rapid OHWM Field Identification Data Sheet, Engineering Form 6250 (USACE 2021). Information on wetland vegetation, soils and hydrology was collected and recorded on the Arid West Wetland Determination Data Form (USACE 2008).

For each aquatic resource, site location and description data were recorded, including the geographical coordinates (longitude and latitude). The boundaries of each area identified as the OHWM of a stream or as a wetland were then delineated using a Trimble Geo7x Geographic Positioning System (GPS) unit with sub-meter accuracy.

The following sections provide more detailed methods specific to the delineation of stream OHWMs and wetlands, respectively.

3.2.1 Identification of Ordinary High Water Mark

The identification of the OHWM of stream features was based on 33 CFR 328.3(e) and the Regulatory Guidance Letter No. 05-05 (USACE 2005), which states:

“The term ordinary high water mark means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.”

Survey locations along perennial intermittent streams were evaluated for changes in physical characteristics, including the primary indicators outlined in *A Field Guide to the Identification of the Ordinary High Water Mark in the Arid West Region of the Western United States* (Lichvar and McColley 2008), including the following:

- Presence of flowing surface water;
- Presence of a break in slope;
- Change in sediment characteristics; and
- Change in vegetation characteristics.

Streams were classified according to their observed Cowardin type (Federal Geographic Data Committee 2013).

3.2.2 Identification of Wetlands

The regulatory definition of a wetland, as provided by the Environmental Protection Agency (EPA), is “those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (Environmental Laboratory 1987).

An area must satisfy three criteria to be designated as a wetland:

- **Vegetation:** The area must support "hydrophytic" species—herbaceous or shrub species that are adapted to areas having soil and hydrologic conditions typical of wetlands.
- **Soil:** Soils present must be classified as hydric, or possessing characteristics associated with reducing soil conditions.
- **Hydrology:** The area must be inundated for at least part of the year at a depth of less than or equal to 6.6 feet.

Detailed information on vegetation, soils, and hydrologic data collection methods are provided below. Wetlands were classified according to their observed Cowardin type (Federal Geographic Data Committee 2013).

Vegetation

Vegetation was sampled using a 1-meter by 1-meter plot. All plant species were identified to species level (to the extent possible) using The Jepson Manual (Baldwin et al. 2012), and species nomenclature was based on the most recent National Wetland Plant List for the Arid West Region (USACE 2020). Any species not on the National Wetland Plant List followed the most recent taxonomy as based on the Jepson eFlora (Jepson Flora Project 2023).

Dominant plant species within four strata at each site (tree, shrub, herb, and woody vine) were identified using the "50/20 rule" to determine those species that "individually or collectively account for more than 50 percent of the total coverage of vegetation stratum, plus any other species that, by itself, accounts for at least 20 percent of the total" (USACE 2008). For each dominant species identified, the absolute percent cover was estimated, and the wetland indicator status was determined (USACE 2020). The "dominance test" was then used to determine the percentage of dominant species at the site that are classified as obligate (OBL), facultative wetland (FACW), or facultative (FAC). Sites at which 50 percent or more of the species were classified as OBL, FACW, or FAC satisfy the USACE wetland vegetation criteria. In cases where the dominance test was 50 percent or less, then the "prevalence index" was used to determine the weighted-average wetland indicator status of all plant species in the sampling plot. A prevalence of less than or equal to 3.0 in this case indicates the presence of hydrophytic vegetation (USACE 2008).

Because 2023 was an unusually high water year, with most of the potential enhancement area being flooded in the early summer, herbaceous vegetation may have responded to flooding conditions within the same calendar year. However, this vegetation may not reflect the conditions in typical water years. Therefore, the presence of wetland vegetation in the herbaceous layer was not relied on to make delineations, and delineators gave greater weight to patterns in woody species distribution to determine the presence of wetlands.

Soils

At each site, a 12- to 20-inch hole was dug to the depth necessary to document a hydric soil indicator or to confirm the absence of indicators. For each soil profile identified, information on the depth of the profile, the color of the soil matrix, redox features, and soil texture were recorded. Munsell Soil Color Charts (Munsell Color Company 2009) were used to determine

the matrix and redox feature color for each soil profile. Soil indicator type(s) were also recorded on the data sheet.

Because 2023 was an unusually high water year, with most of the potential enhancement area being flooded in the early summer, delineators considered soil data the most reliable characteristic in designating the boundary of wetlands within the Study Area. Because they often take multiple years to develop hydric characteristics, soil indicators were considered more representative of average water year conditions in the Study Area.

Hydrology

Hydrologic indicators, including Group A (observation of surface water or saturated soils), Group B (evidence of recent inundation), Group C (evidence of current or recent soil saturation), or Group D (evidence from other site conditions or data), were identified and noted on the data sheet. The presence of at least one primary indicator from any group was considered as evidence that wetland hydrology was present.

Because 2023 was an unusually high water year, with most of the potential enhancement area being flooded in the early summer, less weight was given to Group B and Group C indicators because some areas experienced inundation as a result of the high water year, but would not be inundated in a typical water year. For example, if both sediment deposits (indicator B2) or drift deposits (indicator B3) were observed at a sampling location, but no other hydrology indicators were present, delineators gave greater weight to other indicators to determine the presence of wetlands.

4. RESULTS

Provided below are the results of the preliminary data gathering and the field delineation of aquatic resources in the Study Area.

4.1 Landscape Setting

The Study Area is located on private lands owned by SCE and other private landowners within the Rush Creek Hydroelectric Project FERC boundary (**Map 1**). The Study Area encompasses the nexus of Rush Creek above Silver Lake, Reversed Creek, South Rush Creek, and an un-named perennial stream. All these features convey water into Rush Creek above Silver Lake, which then flows into Silver Lake downstream of the Study Area. Rush Creek continues flowing downstream out of Silver Lake. Eventually, water from Rush Creek flows into Owens Lake in Inyo County, which is the nearest traditional navigable waterway.

No interstate or foreign commerce associated with aquatic resources was observed or documented within the Study Area. Nearby Silver Lake is a popular recreation site, with a campground and motorized boat launch along the shore. Rush Creek above Silver Lake is popular with kayakers and stand-up paddleboarders, and fishing is also a popular activity. Rural residential properties surround the Study Area and the Study Area generally receives moderate levels of recreational use during the summer. The portion of the Study Area east of State Route 158 within the Rush Creek Powerhouse complex is closed to public access and is used in support of hydroelectric operations.

4.1.1 Soils

The Study Area is located at the boundary of two physiographic provinces, each with different landforms. Rush Creek upstream of the Study Area is located in the Sierra Nevada physiographic province. Rush Creek downstream of the Study Area is located in the Basin and Range physiographic province, which continues eastward through most of western North America. The boundary between the two provinces forms a steep escarpment that dominates the landscape in the vicinity of the Project. The Study Area is located in a valley between the dramatic Carson Peak (elevation of 10,908 feet above sea level) and Reversed Peak (elevation of 9,481 feet above sea level). The Study Area lies at an elevation of approximately 7,200 feet above sea level.

The Study Area is generally underlain by Mesozoic granodiorite and localized deposits of glacial till (SCE 2021). The peaks surrounding the Study Area are composed of mainly Mesozoic granitic rocks and Paleozoic and Mesozoic metamorphosed sedimentary and volcanic rocks. The Mono-Inyo Caters and Long Valley Caldera, an active volcanic chain, is located east of June Lake, and the area has experienced periods of numerous earthquakes and ash deposition. In addition, the valley in which the Study Area is located was likely influenced by glacial moraines and the Rush Creek Powerhouse is located on glacial material (SCE 2021). The creeks in the Study Area are also a source of mostly granite alluvium from materials weathered upstream.

The results of the query of the Web Soil Survey (NRCS 2023) are provided in **Appendix B**. Soils underlying the Study Area include Conway-Conway cobbly-Chesaw family association (0 to 15 percent slopes) and Cryorthents – Rock outcrop complex (30 to 50 percent slopes).

Conway soils are typically poorly drained soils that have a low rate of water transmission and are typically sandy and cobbly sandy loams derived from volcanic ash and/or alluvium derived from granite. Chesaw Family soils are somewhat excessively drained soils that have a low rate of water transmission and are typically gravelly loamy sand soils composed of alluvium derived from granite. Cryorthents soils are typically well drained soils that have a high rate of water transmission and are typically gravelly sandy loam soils developed from colluvium/residuum weathered from granite. Rock outcrop soils are very well drained soils that consist mostly of unweathered bedrock. Conway and Chesaw Family soils are considered hydric soils, while Cryorthents and rock outcrops are not (NRCS 2023). However, NRCS soil maps are created on a coarse scale, showing only the dominant soil types that characterize an area, and soil types in the Study Area are diverse considering the number of streams that transport sediment into the Study Area.

4.1.2 Regional and Local Hydrology

The Study Area is located in the Grant Lake-Rush Creek Watershed (Hydrologic Unit Code 180901010301), encompassing approximately 58.2 square miles. The results of the query of the NWI Online Wetlands Mapper, provided in **Appendix C**, indicate nine types of aquatic resources in the vicinity of the Study Area:

- Palustrine Wetlands
    - NWI Classification Code PEM1A: Palustrine emergent wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. The

vegetation is persistent for most of the growing season and is usually dominated by perennial plants. The water regime is temporarily flooded, where surface water is present for brief periods, but the water table is usually below the ground surface.

- NWI Classification Code PEM1C: Palustrine emergent wetlands dominated by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. The vegetation is persistent for most of the growing season and is usually dominated by perennial plants. The water regime is seasonally flooded, with surface water present for extended periods early in the growing season, but is usually absent by the end of the growing season. Soils may be saturated to the surface.
- NWI Classification Code PFOA: Palustrine forested wetlands dominated by woody vegetation that is 6 meters tall or taller. The water regime is temporarily flooded.
- NWI Classification Code PSAA: Palustrine scrub-shrub wetlands dominated by woody vegetation less than 6 meters tall. Species can include true shrubs, young trees, or trees/shrubs stunted because of environmental conditions. The water regime is temporarily flooded.
- NWI Classification Code PSSC: Palustrine scrub-shrub wetlands dominated by woody vegetation less than 6 meters tall. Species can include true shrubs, young trees, or trees/shrubs stunted because of environmental conditions. The water regime is seasonally flooded.

- Riverine Features
  - NWI Classification Code R2UBHx: A lower perennial riverine system characterized by a low gradient, and some water flows year round, except during years of extreme drought. The substrate class is unconsolidated bottom, with at least 25% cover of particles smaller than stones and a vegetative cover less than 30%. The water regime is permanently flooded, and the channel is excavated by humans.
  - NWI Classification Code R3RBH: An upper perennial riverine system characterized by a high gradient. Water typically flows year-round, except in years of extreme drought. The substrate consists of rock, cobbles, or gravel with occasional sand patches. Typically there is little floodplain development. Substrates have majority cover of stones, boulders, or bedrock at 75% cover or greater and vegetative cover of less than 30%. The water regime is permanently flooded.
  - NWI Classification Code R4SBC: An intermittent riverine system characterized by channels that contain flowing water only part of the year. Isolated pools of water may be present in the streambed during the dry season. The water regime is seasonally flooded.
  - NWI Classification Code R5UBF: An unknown perennial riverine system where the distinction between lower perennial, upper perennial, and intermittent cannot be made from aerial photography. The substrate class is unconsolidated bottom, with at least 25% cover of particles smaller than stones and a vegetative cover less than 30%. The water regime is semi-permanently flooded, where water is present in the growing season throughout most years.

The nearest WETS Tables station is in Lee Vining, California. A table showing average precipitation data between 2022 and 2022 can be found in **Appendix D**. Precipitation mostly falls as snowfall and is heaviest between November and March.

Refer to Section 4.4 for the location and extent of aquatic resources (including wetlands) identified in the Study Area based on the field survey.

4.1.3 Vegetation Communities

The Study Area is located at approximately 7,200 feet in elevation, and is characterized by vegetation communities that are typical of the eastern slopes of the Sierra Nevada.

Vegetation communities associated with wetland areas in the Study Area included *Pinus contorta* ssp. *murrayana* Forest Alliance (lodgepole pine forest); *Populus tremuloides* Forest and Shrubland Alliance (aspen groves); *Salix boothii – Salix geyeriana – Salix lutea* Shrubland Alliance (Booth's willow – Geyer's willow – yellow willow thickets); and *Scirpus microcarpus* Herbaceous Alliance (small-fruited bulrush marsh). A variety of willow species were observed in the willow thickets, and a diverse array of herbaceous vegetation was also observed in the wet areas.

Vegetation communities associated with upland areas in the Study Area included *Juniperus occidentalis* Forest Alliance (western juniper woodland); *Pinus contorta* ssp. *murrayana* Forest Alliance (lodgepole pine forest); *Populus tremuloides* Forest and Shrubland Alliance (aspen groves); *Pinus jeffreyi* Forest Alliance (Jeffrey pine forest); and barren, developed areas around the Rush Creek Powerhouse complex and along State Route 158. The dominant vegetation communities in the Study Area were lodgepole pine forest and aspen groves.

4.2 Aquatic Resources

Aquatic resources identified within the 14.23-acre Study Area during the field delineation include seven perennial streams, two intermittent streams, 17 palustrine forested wetlands, three palustrine scrub shrub wetlands, and three palustrine emergent wetlands. These features are summarized in **Table 2**, below, and described more fully in Sections 4.4.1 through 4.4.2, below. **Maps 2a and 2b** shows the location and extent of these features in the Study Area. Photographs of the Study Area are provided in **Appendix E** and maps of photograph locations are provided in **Maps 3a and 3b.** Data sheets for ordinary high water mark (OHWM) information are provided in **Appendix F**; data sheets for information obtained at each wetland sample point are provided in **Appendix G**; a list of plants observed during the field delineation is provided in **Appendix H**; and the aquatic resources Excel sheet is provided in **Appendix I**.

Table 2. Aquatic Resources Identified in the Study Area.

Aquatic Resources	Map ID	Size of Resources Within Study Area	Location of Feature (Latitude/Longitude)
Riverine, Perennial			
Rush Creek Powerhouse Tailrace	TR	345 linear feet	37.766633/-119.122521
Rush Creek above Silver Lake	RC	1,285 linear feet	37.765703/-119.121769
Reversed Creek	REVCRK	135 linear feet	37.766396/-119.120638
South Rush Creek Segment B	SRC_B	170 linear feet	37.765283/-119.120562
South Rush Creek Segment C	SRC_C	444 linear feet	37.765602/-119.120715
Perennial Stream Segment A	PS_01A	102 linear feet	37.764391/-119.120511
Perennial Stream Segment B	PS_01B	106 linear feet	37.764732/-119.120489
Riverine, Intermittent			
South Rush Creek Segment A	SRC_A	497 linear feet	37.764657/-119.121655
Intermittent Stream 1	IS_01	75 linear feet	37.764349/-119.121113
Palustrine Forested Wetlands			
Palustrine Forested Wetland 1	PFO_01	0.065 acre	37.765730/-119.121794
Palustrine Forested Wetland 2	PFO_02	0.022 acre	37.765670/-119.121546
Palustrine Forested Wetland 3	PFO_03	0.043 acre	37.765522/-119.121835
Palustrine Forested Wetland 4	PFO_04	0.083 acre	37.764800/-119.120862
Palustrine Forested Wetland 5	PFO_05	0.670 acre	37.764518/-119.120764
Palustrine Forested Wetland 6	PFO_06	0.028 acre	37.764847/-119.120493
Palustrine Forested Wetland 7	PFO_07	0.002 acre	37.764491/-119.120456
Palustrine Forested Wetland 8	PFO_08	0.029 acre	37.764344/-119.120487
Palustrine Forested Wetland 9	PFO_09	0.111 acre	37.766515/-119.122326
Palustrine Forested Wetland 10	PFO_10	0.389 acre	37.767318/-119.122431
Palustrine Forested Wetland 11	PFO_11	0.082 acre	37.766969/-119.121851
Palustrine Forested Wetland 12	PFO_12	0.135 acre	37.766890/-119.121540
Palustrine Forested Wetland 13	PFO_13	0.179 acre	37.766760/-119.120967
Palustrine Forested Wetland 14	PFO_14	0.220 acre	37.767439/-119.121755
Palustrine Forested Wetland 15	PFO_15	0.502 acre	37.766965/-119.120900
Palustrine Forested Wetland 16	PFO_16	1.086 acres	37.765824/-119.120967
Palustrine Forested Wetland 17	PFO_17	0.030 acre	37.765257/-119.120542
Palustrine Scrub Shrub Wetlands			
Palustrine Scrub Shrub Wetland 1	PSS_01	0.379 acre	37.766533/-119.121645
Palustrine Scrub Shrub Wetland 2	PSS_02	0.044 acre	37.766295/-119.120624
Palustrine Scrub Shrub Wetland 3	PSS_03	0.280 acre	37.766383/-119.120923
Palustrine Emergent Wetlands			
Palustrine Emergent Wetland 1	PEM_01	0.009 acre	37.765900/-119.121735
Palustrine Emergent Wetland 2	PEM_02	0.340 acre	37.767286/-119.121240
Palustrine Emergent Wetland 3	PEM_03	0.024 acre	37.766389/-119.120563

4.2.1 Perennial Streams (Riverine, Perennial)

The Study Area contains seven perennial streams (Cowardin Type R2UB), each of which is described in the sections below. Refer to **Table 3** for a summary of parameters evaluated in the delineation of the OHWM of these perennial streams, including presence of surface water, observed breaks in slopes, and changes in sediment or vegetation. Refer to **Appendix J** for information on culverts present on perennial streams. Photographs of perennial streams are provided in **Appendix E** and data sheets for ordinary high water mark (OHWM) identification are provided in **Appendix F**.

Table 3. Summary of Perennial Streams Identified in the Study Area.

Map ID	Stream Size (linear feet)	Results of Parameter Evaluation (x = parameter is present)			
		Surface Water	Break in Slope	Change in Sediment	Change in Vegetation
TR	345	X	X	X	X
RC	1,285	X	X	X	X
REVCRK	135	X	X		X
SRC_B	170	X	X		X
SRC_C	444	X	X		X
PS_01A	102	X	X		X
PS_01B	106	X	X		X

Rush Creek Powerhouse Tailrace (TR)

The Rush Creek Powerhouse Tailrace (TR) is a manmade that channels water from the Agnew Junction to Rush Creek Powerhouse Penstock through the Rush Creek Powerhouse. Water in these penstocks is diverted from Gem and Agnew lakes upstream of the Study Area. The TR begins at the powerhouse at the western edge of the Study Area and runs through a 14-foot-wide man-made concrete channel until it flows underneath a bridge (**Map 2a**). From the bridge, the TR widens to an OHWM width of 26 feet, and the channel returns to a cobble-gravel substrate. Overflow from the TR flows into a palustrine forested wetland in this area (refer to Section 4.2.3, below). The TR then flows through two culverts underneath State Route 158 (refer to **Appendix J**). After flowing under State Route 158, the OWHM of the TR is approximately 24 feet. The TR flows into Rush Creek above Silver Lake at the northern end of the Study Area. A deep, wide pool forms at this location. The TR flows for a total of 345 linear feet in the Study Area.

Flowing water was present at the time of the survey, with a variable depth. Water levels were observed to vary throughout the day in association with Rush Creek Powerhouse operations. Other than the concrete-lined channel before the bridge, the banks are vegetated with willows (*Salix* spp.) (FACW – OBL) and quaking aspen (*Populus tremuloides*) (FACU). The steep banks are bermed and show evidence that this feature is a man-made channel, even where native vegetation has established along the banks.

Because the delineation was done at a low-flow season, the OHWM was delineated using the break in slope along the bank, a transition from cobble/gravel in the streambed to leaf litter on the banks, and from the line of exposed roots below an intact soil layer.

Rush Creek Above Silver Lake (RC)

Rush Creek above Silver Lake (RC) enters the Study Area at its western boundary before flowing underneath a bridge within the Rush Creek Powerhouse development (**Map 2a**). The OHWM of RC is relatively narrow in this section at approximately 16 feet. After crossing under the bridge, RC widens to an OHWM width of approximately 98 feet and is associated with the growth of three palustrine forested wetlands (refer to Section 4.2.3, below) and one palustrine emergent wetland (refer to Section 4.2.5, below). RC then flows through six culverts underneath State Route 158 (refer to **Appendix J**) and continues to the northeast. After flowing under State Route158, the OWHM of RC is approximately 20 feet. Reversed Creek flows into RC near the eastern boundary of the Study Area, and then RC turns to flow in a northwest direction and gradually widens to an OHWM of 30 feet near the nexus with the TR. A deep, wide pool forms at this location before RC turns and flows north out of the Study Area. RC flows for a total of 1,285 linear feet in the Study Area.

Flowing water was present at the time of the survey, with a variable depth. The banks are vegetated with willows (FACW – OBL), quaking aspen (FACU), and lodgepole pine (*Pinus contorta*) (FAC). Common herbaceous species include wetland associates such as red-tinge bulrush (*Scirpus microcarpus*) (OBL) and sedges (*Carex* spp.) (FAC – OBL) where RC adjoins associated palustrine forested wetlands (refer to Section 4.2.3, below), palustrine scrub shrub wetlands (refer to Section 4.2.4), and palustrine emergent wetlands (refer to Section 4.2.5, below). Where RC adjoins upland areas, plants such as Woods' rose (*Rosa woodsii*) (FACU) and blue wild rye (*Elymus glaucus*) (FACU) are more common.

Because the delineation was done at a low-flow season, the OHWM was delineated using a clear break in slope along the bank, a transition from cobble/gravel in the streambed to sturdy growth of lodgepole pine (FAC) along the OHWM, and from the line of exposed tree roots below an intact soil layer. Where RC adjoined wetlands, a clear shelf at the top of the bank was present, where the unvegetated stream channel met extensive growth of willows (FACW – OBL) and herbaceous vegetation such as red-tinge bulrush (OBL). This line was used to distinguish the stream from the adjoining wetlands.

Reversed Creek (REVCRK)

Reversed Creek (REVCRK) flows into the Study Area from the eastern boundary for approximately 135 linear feet before flowing into RC (**Maps 2a and 2b**). REVCRK adjoins two palustrine scrub shrub wetlands (refer to Section 4.2.4, below) and one palustrine emergent wetland (refer to Section 4.2.5, below). The OHWM width of REVCRK in the Study Area is 12 feet.

Flowing water was present at the time of the survey at a depth of approximately 3 feet. A steep bank was present along the entire length of REVCRK, with an abrupt transition from unvegetated streambank to heavily vegetated banks dominated by willows (FACW – OBL), quaking aspen (FACU), and herbaceous vegetation such as red-tinge bulrush (OBL).

Because the delineation was done at a low-flow season, the OHWM was delineated using a clear break in slope along the bank, a transition from unvegetated channel to heavily vegetated streambanks, and the presence of undercut roots along the OHWM line.

South Rush Creek Segment B (SRC_B)

South Rush Creek Segment B (SRC_B) is formed by the intersection of Perennial Stream Segment B and the intermittent South Rush Creek Segment A (SRC_A) (refer to Section 4.2.2, below) (**Map 2b**). SRC_B flows underneath State Route 158 though two culverts (refer to **Appendix J** for more information) before passing outside the Study Area. SRC_B adjoins three palustrine forested wetlands (refer to Section 4.2.3, below). SRC_B flows for 170 linear feet in the Study Area and the OHWM width is 5 feet.

Flowing water was present at the time of the survey at a depth of approximately 3 feet. The OHWM is indicated by an abrupt change in slope at the bank, where the stream transitions from unvegetated sandy channel to herbaceous vegetation such as red-tinge bulrush (OBL). This line was used to demarcate the boundary between SRC_B and the surrounding palustrine forested wetlands.

South Rush Creek Segment C (SRC_C)

South Rush Creek Segment C (SRC_C) enters the Study Area on the eastern boundary and flows for 444 feet before its outlet into REVCRK (**Maps 2a and 2b**). SRC_C adjoins one palustrine forested wetland (refer to Section 4.2.3, below) and two palustrine scrub shrub wetlands (refer to Section 4.2.4, below). The OHWM width of SRC_C is 5 feet.

Flowing water was present at the time of the survey at a depth of approximately 3 feet. The OHWM is indicated by an abrupt change in slope at the bank, where the stream transitions from unvegetated sandy channel to herbaceous vegetation such as red-tinge bulrush (OBL) near wetlands and lodgepole pine (FAC) near uplands.

Perennial Stream 1 Segment A (PS_01A)

Perennial Stream 1 Segment A (PS_01A) flows into the southeastern edge of the Study Area for 102 feet (**Map 2b**). PS_01A adjoins three palustrine forested wetlands (refer to Section 4.2.3, below) before flowing out of the Study Area. The OHWM width of PS_01A is 4 feet.

Flowing water was present at the time of the survey at a depth of approximately 4 feet. A clear transition from unvegetated stream channel to dense cover of herbaceous vegetation such as red-tinge bulrush (OBL) and bluejoint (*Calamagrostis canadensis*) (FACW) was used to delineate the OHWM line.

Perennial Stream 1 Segment B (PS_01B)

Perennial Stream 1 Segment B (PS_01AB) flows into the southeastern edge of the Study Area for 106 feet before merging with the intermittent South Rush Creek Segment A (refer to Section 4.2.2, below) just before State Route 158 (**Map 2b**). PS_01A adjoins two palustrine forested wetlands (refer to Section 4.2.3, below). The OHWM width of PS_01B is 4 feet.

Flowing water was present at the time of the survey at a depth of approximately 4 feet. A clear transition from unvegetated stream channel to dense cover of herbaceous vegetation such as red-tinge bulrush (OBL) and bluejoint (FACW) was used to delineate the OHWM line.

4.2.2 Intermittent Streams (Riverine, Intermittent)

The Study Area contains two intermittent streams (Cowardin type R4SB). Each intermittent stream is described in the sections below. Refer to **Table 4** for a summary of parameters evaluated in the delineation of the OHWM of these intermittent streams, including presence of surface water, observed breaks in slopes, and changes in sediment or vegetation. Photographs of these features are provided in **Appendix E** and data sheets for ordinary high water mark (OHWM) identification are provided in **Appendix F**.

Table 4. Summary of Intermittent Streams Identified in the Study Area.

Map ID	Stream Size (linear feet)	Results of Parameter Evaluation (x = parameter is present)			
		Surface Water	Break in Slope	Change in Sediment	Change in Vegetation
SRC_A	497		X	X	X
IS_01	75		X		X

South Rush Creek Segment A (SRC_A)

SRC_A flows into the Study Area from the southwest for 497 linear feet before merging with PS_01B (refer to Section 4.2.1, above) (**Map 2b**). South Rush Creek Segment A adjoins two palustrine forested wetlands (refer to Section 4.2.3, below). The OHWM width of SRC_A is 14 feet at its upstream extent, and widens to 15 feet along the palustrine forested wetlands.

Flowing water was not present at the time of the survey. The OHWM line was delineated through a break in the slope and a transition from cobble substrate to leaf litter (where SRC_A flows through upland areas) and herbaceous vegetation (where it flows through wetland areas).

Intermittent Stream 1 (IS_01)

Intermittent Stream 1 (IS_01) flows into the Study Area for 75 linear feet from the southern edge before its outlet into SRC_A (**Map 2b**). IS-1 also flows through a palustrine forested wetland (refer to Section 4.2.3, below) for part of its length. IS-1 contains a clear bed and bank from a clear break in slope. The streambed is unvegetated, and a vegetation transition to graminoid species bluejoint (FACW), blue wild rye (FACU) and sedges (FAC – OBL) demarcates the 2-foot wide OHWM line.

Flowing water was not present at the time of the survey, which was conducted during the low-flow season. The OHWM line was delineated through a transition from an unvegetated channel to herbaceous vegetation on the streambanks, and an accompanying change in slope.

4.2.3 Palustrine Forested Wetlands

The Study Area contains 17 palustrine forested wetlands (Cowardin Type PFO). Each palustrine forested wetland is described in the sections below. Refer to **Table 5** for the map abbreviation, the size of the wetland (acres within the Study Area), paired data points used to establish the boundary of the wetland, results of the wetland indicators present, and plant species observed. Because some forested wetlands were very similar, some wetlands were delineated using similar topographies and/or transitions in vegetation communities observed at other wetlands with paired data points. Photographs of these features are provided in **Appendix E** and wetland datasheets are provided in **Appendix G**.

Table 5. Summary of Palustrine Forested Wetlands Identified in the Study Area.

Map ID	Wetland Size (Acres)	Paired Sample Points	Results of Three-Parameter Evaluation (x= parameter is present)			Representative Plant Species Observed
			Vegetation	Soils	Hydrology	
PFO_01	0.065	EA_04	X	X	X	Lemmon's willow, field horsetail, tall scouring-rush
		EA_05	X			Lodgepole pine, arroyo willow, quaking aspen, tall scouring-rush
PFO_02	0.022	EA_06	X	X	X	Arroyo willow, field horsetail
		EA_05	X			Lodgepole pine, arroyo willow, quaking aspen, tall scouring-rush
PFO_03	0.043	EA_07	X	X	X	Arroyo willow, bluejoint
		EA_05	X			Lodgepole pine, arroyo willow, quaking aspen, tall scouring-rush
PFO_04	0.083	EA_08	X	X	X	Arroyo willow, Northwest territory sedge, red-tinge bulrush
		EA_09	X		X	Bluejoint, Idaho bent
		EA_10				Orchard grass
PFO_05	0.670	EA_11	X	X	X	Red-tinge bulrush, bluejoint
		EA_12	X	X	X	Field horsetail, Idaho bent, tall manna grass
		EA_13				White fir, blue wild rye
PFO_06	0.028	Based on vegetation community similarity to PFO_04 and presence within the same floodplain, both topography and the vegetation community transition were used to delineate this wetland.				
PFO_07	0.002	Based on vegetation community similarity to PFO_05 and presence within the same floodplain, both topography and the vegetation community transition were used to delineate this wetland.				
PFO_08	0.029	Based on vegetation community similarity to PFO_05 and presence within the same floodplain, both topography and the vegetation community transition were used to delineate this wetland.				
PFO_09	0.111	EA_14				Quaking aspen, three-square
		EA_15	X	X	X	Quaking aspen, Lemmon's willow, red-tinge bulrush
PFO_10	0.389	EA_16			X	Quaking aspen, red-tinge bulrush
		EA_17	X	X	X	Northwest territory sedge, quaking aspen, Geyer's willow, Pacific willow, arroyo willow
		EA-18	X		X	Quaking aspen, red-tinge bulrush
PFO_11	0.082	EA-19			X	Quaking aspen
		EA-20	X	X	X	Quaking aspen, Northwest territory sedge, red-tinge bulrush

Table 5. Summary of Palustrine Forested Wetlands Identified in the Study Area.

Map ID	Wetland Size (Acres)	Paired Sample Points	Results of Three-Parameter Evaluation (x= parameter is present)			Representative Plant Species Observed
			Vegetation	Soils	Hydrology	
PFO_12	0.135	Based on vegetation community similarity to PFO_11 and presence within the same floodplain, both topography and the vegetation community transition were used to delineate this wetland.				
PFO_13	0.179	Based on vegetation community similarity to PFO_11 and presence within the same floodplain, both topography and the vegetation community transition were used to delineate this wetland.				
PFO_14	0.220	Based on vegetation community similarity to PFO_15 and presence within the same floodplain, both the topography and the vegetation community transition were used to delineate this wetland.				
PFO_15	0.502	EA_22	X			Lodgepole pine, field horsetail
		EA_23	X	X	X	Geyer's willow, red-tinge bulrush, woolly sedge
		EA_24	X			Lodgepole pine, bluejoint
PFO_16	1.086	EA_30			X	Lodgepole pine, quaking aspen
		EA_31	X	X	X	Lodgepole pine, tall scouring-rush
PFO_17	0.030	Based on vegetation community similarity to PFO_16 and presence within the same floodplain, both the topography and the vegetation community transition were used to delineate this wetland.				

Palustrine Forested Wetland 1 (PFO_01)

PFO_01 is a palustrine forested wetland that has formed within the OHWM of RC (**Maps 2a and 2b**). During the high flow season, this wetland is inundated by Rush Creek and soil is exposed later in the season once the flows recede. The wetland is approximately 50 feet wide. The extent of wetland within the Study Area is 0.065 acre.

The wetland meets all three wetland indicators as typified by sample point EA_04:

- **Vegetation**: The shrub stratum is dominated by Lemmon's willow (*Salix lemmonii*) (FACW). Immediately surrounding the wetland is high canopy cover of lodgepole pine (FAC). Herbaceous vegetation within the forested wetland is dominated by field horsetail (*Equisetum arvense*) (FAC) and tall scouring-rush (*Equisetum hyemale*) (FACW). The vegetation passed the dominance test and therefore indicates hydrophytic vegetation.
- **Soils:** Soils were determined to be hydric based on the presence of gleyed particles within a sandy gleyed matrix (indicator S4).
- **Hydrology:** Hydrology at the wetland sample point was evidenced by three primary indicators (high water table at a depth of 10 inches [indicator A2], soil saturation to the surface of the soil [indicator A3], and oxidized rhizospheres along living roots [indicator C3]).

Adjacent uplands, typified by sample point EA_05, are dominated by similar wetland species to sample point EA_04, but also contained some upland species such as quaking aspen (FACU) and Woods' rose (FACU). These points lacked hydric soil indicators and hydrology. Therefore,

the mapped boundaries between upland areas and wetlands were determined using topography, evident hydrology at the time of the survey, and soil data from the soil pits. The boundaries between PFO_01 and the adjacent RC were determined based on OHWM indicators (i.e., natural break in topography creating a distinct bank line; presence of cobble and gravel in the bank of RC) and the lack of woody vegetation within the active stream channel.

Palustrine Forested Wetland 2 (PFO_02)

PFO_02 is a palustrine forested wetland that has formed in a depression adjacent to RC (**Maps 2 and 2b**). During the high flow season, overflow from RC fills this depression and the soil is exposed later in the season once flows recede. The wetland is approximately 25 feet wide. The extent of the wetland in the Study Area is 0.022 acre.

The wetland meets all three wetland indicators as typified by sample point EA_06:

- **Vegetation**: The tree stratum is dominated by arroyo willow (*Salix lasiolepis*) (FACW). The herbaceous stratum is dominated by field horsetail (FAC). Immediately surrounding the wetland is high canopy cover of lodgepole pine (FAC) and quaking aspen (FACU). The vegetation passed the dominance test and therefore indicates hydrophytic vegetation.
- **Soils:** Soils were determined to be hydric based on the presence of a depleted matrix (indicator F3).
- **Hydrology:** Hydrology at the wetland sample point was evidenced by two primary indicators (soil saturation to a depth of 4 inches [indicator A3] and water-stained leaves [indicator B9]).

Adjacent uplands, typified by sample point EA_05, are dominated by similar wetland species to sample point EA_04, but also contained some upland species such as quaking aspen (FACU) and Woods' rose. These points lacked hydric soil indicators and hydrology. Therefore, the mapped boundaries between upland areas and wetlands were primarily determined using topography, changes in soil characteristics, and a transition from arroyo willow (FACW) to Woods' rose (FACU).

Palustrine Forested Wetland 3 (PFO_03)

PFO_03 is a palustrine forested wetland that has formed within the OHWM of RC to the west of State Route 158 (**Maps 2a and 2b**). During the high flow season, this wetland is inundated by RC and soil is exposed later in the season once the flows recede. The wetland is approximately 25 feet wide. The extent of the wetland in the Study Area is 0.043 acre.

The wetland meets all three wetland indicators as typified by sample point EA_07:

- **Vegetation**: The tree stratum is dominated by arroyo willow (FACW). The herbaceous stratum is dominated by bluejoint (FACW). Immediately surrounding the wetland is high canopy cover of lodgepole pine (FAC) and quaking aspen (FACU). The vegetation within the wetland passed the dominance test and therefore indicates hydrophytic vegetation.
- **Soils:** Soils were determined to be hydric based on the presence of redox features underneath a dark surface (indicator F6).

- **Hydrology:** Hydrology at the wetland sample point was evidenced by two primary indicators (a highwater table to a depth of 6 inches [indicator A2], soil saturation to a depth of 1 inch [indicator A3], and oxidized rhizospheres along living roots [indicator C3]).

Adjacent uplands, typified by sample point EA_05, are dominated by similar wetland species to sample point EA_04, but also contained some upland species such as quaking aspen (FACU) and Woods' rose (FACU). These points lacked hydric soil indicators and hydrology. Therefore, the mapped boundaries between upland areas and wetlands were primarily determined using topography, changes in soil characteristics, and a transition from arroyo willow (FACW) to Woods' rose (FACU). The boundaries between PFO_03 and the adjacent RC were determined based on OHWM indicators along the channel (i.e., natural break in topography creating a distinct bank line; presence of cobble and gravel in the bank of RC) and lack of woody vegetation within the active stream channel.

Palustrine Forested Wetland 4 (PFO_04)

PFO_04 is a palustrine forested wetland that has formed in a depression adjacent to SRC_A (**Map 2b**). During the high flow season, overflow from SRC_A fills this depression and the soil is exposed later in the season once flows recede. The wetland is approximately 35 feet wide. The extent of the wetland in the Study Area is 0.083 acre.

The wetland meets all three wetland indicators as typified by sample point EA_08:

- **Vegetation**: The tree stratum is dominated by arroyo willow (FACW). The herbaceous stratum is dominated by Northwest territory sedge (*Carex utriculata*) (OBL) and red-tinge bulrush (OBL). The vegetation passed the dominance test and therefore indicates hydrophytic vegetation.
- **Soils:** Soils were determined to be hydric because of the sandy mucky mineral character (indicator S1).
- **Hydrology:** Hydrology at the wetland sample point was evidenced by two primary indicators (a high water table to a depth of 2 inches [indicator A2] and soil saturation to the soil surface [indicator A3]).

The transition between wetland and upland is subtle at this location, because a point taken slightly upslope (sample point EA_09) contained facultative wetland species such as bluejoint (FACW) and Idaho bent (*Agrostis idahoensis*) (FACW), but the soil was not characteristic of wetlands. Delineators noticed a slight break in slope along a gentle terrace between sample points EA_08 and EA_09 where there was a change in vegetation. Inundation is visible on aerial imagery near sample point EA_09, but the area could flood seasonally after snowmelt for brief periods. A point taken further upslope on a terrace (sample point EA_10) showed a dominance of upland species in the herb stratum such as orchard grass (*Dactylis glomerata*) (FACU). Therefore, the boundaries between PFO_04 and adjacent uplands were determined based on a vegetation transition between obligate Northwest territory sedge and red-tinge bulrush to bluejoint and Idaho bent, as well as the slight break in slope that was identified in the field.

Palustrine Forested Wetland 5 (PFO_05)

PFO_05 is a palustrine forested wetland that has formed in the floodplain between SRC_A, PS_01A, and PS_01B (**Map 2b**). During the high flow season, overflow from SRC_A, PS_01A, and PS_01B inundates this area and the soil is exposed later in the season once flows recede. Large lodgepole pine (FAC) trees are scattered throughout this wetland, which leads to moderately high canopy cover. The wetland is approximately 140 feet wide. The extent of the wetland in the Study Area is 0.670 acre.

The wetland meets all three wetland indicators as typified by sample points EA_11 and EA_12:

- **Vegetation**: The tree stratum is dominated by lodgepole pine (FAC). The herbaceous stratum is dominated by red-tinge bulrush (OBL), bluejoint (FACW), field horsetail (FAC), Idaho bent (FACW), and tall manna grass (*Glyceria elata*) (FACW). The vegetation passed the dominance test at both points and therefore indicates hydrophytic vegetation. Growth of herbaceous vegetation was extremely thick and bare soil was not visible.
- **Soils:** Soils were determined to be hydric because of the presence of redox features underneath a dark surface (indicator F6).
- **Hydrology:** Hydrology at the wetland sample points was evidenced by two primary indicators (inundation visible on aerial imagery [indicator B7] and oxidized rhizospheres along living roots [indicator C3]).

Adjacent uplands, typified by sample point EA_13 contained upland tree species in the tree stratum such as white fir (*Abies concolor*) (NI) and blue wild rye (FACU). Herbaceous cover was much lower at sample point EA_13 (25 percent total cover in the herb stratum) compared to sample points EA_11 and EA_12 (100 percent total cover in the herb stratum). PFO_05 is found in a natural bowl with almost flat topography, and sample point EA_13 was taken at the base of a surrounding slope at the westernmost edge of the wetland. Therefore, the mapped boundaries between upland areas and wetlands were primarily determined using topography and changes in cover of herbaceous vegetation.

Palustrine Forested Wetland 6 (PFO_06)

PFO_06 is a palustrine forested wetland that is east of PS_01B (**Map 2b**). The wetland is approximately 6 feet wide. The extent of the wetland in the Study Area is 0.028 acre. During the high flow season, overflow from PS_01B inundates this area and the soil is exposed later in the season once flows recede.

This wetland is characterized by willows (FACW – OBL) and herbaceous species such as sedges (FAC – OBL) and red-tinge bulrush (OBL). A wetland point was not taken at this location because of the similarity in vegetation and topography to PFO_04. This wetland is bordered by the road berm of State Route 158 and extends to the eastern edge of the Study Area. The road berm marks a dramatic change in slope and is mostly unvegetated.

Palustrine Forested Wetland 7 (PFO_07)

PFO_07 is a palustrine forested wetland that is east of PS_01A (**Map 2b**). The wetland is approximately 10 feet wide. The extent of the wetland in the Study Area is 0.002 acre. During the high flow season, overflow from PS_01A 1 inundates this area and the soil is exposed later in the season once flows recede.

This small wetland is characterized by herbaceous species such as red-tinge bulrush (OBL), bluejoint (FACW), and Idaho bent (FACW), and is limited along the bank of PS_01A. A wetland point was not taken at this location because of its similarity in vegetation and topography to PFO_05 and PFO_08.

Palustrine Forested Wetland 8 (PFO_08)

PFO_08 is a palustrine forested wetland that is east of PS_01A (**Map 2b**). The wetland is approximately 15 feet wide. The extent of the wetland in the Study Area is 0.029 acre. During the high flow season, overflow from PS_01A inundates this area and the soil is exposed later in the season once flows recede.

This wetland is characterized by herbaceous species such as red-tinge bulrush (OBL), bluejoint (FACW), and Idaho bent (FACW). A wetland point was not taken at this location because of its similarity in vegetation and topography to PFO_05 and PFO_07. This wetland extends from the bank of PS_01A to the eastern edge of the Study Area. It is physically disjunct from PFO_07 by a footpath that leads to PS_01A from the adjacent houses located just east of the Study Area.

Palustrine Forested Wetland 9 (PFO_09)

PFO_09 is a palustrine forested wetland that is hydrologically connected to the TR and occurs in a depression that fills with water during the high-flow season (**Map 2a**). The soil is then exposed later in the season once the flows recede. The wetland is approximately 40 feet wide. The extent of the wetland in the Study Area is 0.111 acre.

The wetland meets all three wetland indicators as typified by sample point EA_15:

- **Vegetation**: The tree stratum is dominated by quaking aspen (FACU), with a lesser amount of Lemmon's willow (FACW). The herbaceous stratum is dominated by red-tinge bulrush (OBL). Though the vegetation did not pass the dominance test, the prevalence index was less than 3.0, indicating hydrophytic vegetation.
- **Soils:** Soils were determined to be hydric because of the presence of a hydrogen sulfide odor when the soil was disturbed (indicator A4).
- **Hydrology:** Hydrology at the wetland sample points was evidenced by three primary indicators (water-stained leaves [indicator B9], a hydrogen sulfide odor [indicator C1], and oxidized rhizospheres along living roots [indicator C3]).

Adjacent uplands, typified by sample point EA_14 contained quaking aspen (FACU) in the tree stratum, but lacked growth of willows (FACW – OBL). The herb stratum contained three-square (*Schoenoplectus pungens*) (OBL), with a lesser amount of flat-stem blue grass (*Poa compressa*) (FACU) and fragile-sheath sedge (*Carex fracta*) (FAC). Though some of the species were wetland obligates, the prevalence index was greater than 3.0, indicating that the vegetation was not hydrophytic.

The mapped boundaries between upland areas and wetlands were primarily determined using topography (i.e., a noticeable break in slope) and the lack of willows growing in the upland areas.

Palustrine Forested Wetland 10 (PFO_10)

PFO_10 is a palustrine forested wetland that is hydrologically connected to RC and the TR and occurs in a depression that fills with water during the high-flow season (**Map 2a**). The wetland lies underneath a transmission line corridor and there is evidence of vegetation trimming compared to surrounding areas. The wetland is approximately 100 feet wide. The extent of the wetland in the Study Area is 0.389 acre.

The wetland meets all three wetland indicators as typified by sample point EA_17:

- **Vegetation**: A point was taken in a clearing because most of the ground in PFO_10 is densely latticed with willow roots, making digging a soil pit nearly impossible. Young quaking aspen (FACU), Geyer's willow (*Salix geyeriana*) (OBL), Pacific willow (*Salix lasiandra*) (FACW), and arroyo willow (FACW) were observed in this wetland. At the wetland point, the herbaceous stratum is dominated by Northwest territory sedge (OBL), with a lesser amount of red-tinge bulrush (OBL) and bluejoint (FACW). The vegetation passed the dominance test and therefore indicates hydrophytic vegetation. Growth of willows and herbaceous vegetation was extremely thick and bare soil was not visible in the majority of the wetland.
- **Soils**: Soils were determined to be hydric because of the presence of a depleted dark surface (indicator F7).
- **Hydrology:** Hydrology at the wetland sample point was evidenced by three primary indicators (saturation of the soil at a depth of 10 inches [indicator A3], inundation visible on aerial imagery [indicator B7], and oxidized rhizospheres along living roots [indicator C3]), and one secondary indicator (sediment deposits in a riverine system [indicator B2]).

Adjacent uplands, typified by sample points EA_16 and EA_18, contained quaking aspen (FACU) in the tree stratum, but lacked the associated growth of willows. The herb stratum contained significant growth of red-tinge bulrush (OBL). The prevalence index was less than 3.0, indicating hydrophytic vegetation at both these points, but hydric soil indicators and hydrology indicators were not sufficient to determine these areas as a wetland.

During June/July 2023, nearly the entire potential enhancement area downstream of State Route 158 was flooded, and almost all the trees had evidence of sediment deposits on the base. The 2023 snowmelt runoff was a very high water year, and it is possible that herbaceous vegetation responded quickly to the high water conditions. Thus, the delineation required a greater reliance on soil pits and by patterns in the woody vegetation to determine wetland characteristics that represent typical conditions in the potential enhancement area.

Therefore, the mapped boundaries between upland areas and PFO_10 were primarily determined using the lack of willows (FACW – OBL) growing in the surrounding upland areas.

Palustrine Forested Wetland 11 (PFO_11)

PFO_11 is a palustrine forested wetland that is hydrologically connected to the RC and the TR and occurs in a depression that fills with water during the high-flow season and when the nearby powerhouse is in operation (**Map 2a**). The wetland lies in a depression approximately 2 feet lower compared to surrounding upland areas. The wetland is approximately 50 feet wide. The extent of the wetland in the Study Area is 0.082 acre.

The wetland meets all three wetland indicators as typified by sample point EA_20:

- **Vegetation**: The tree stratum was dominated by quaking aspen (FACU). The herb stratum was dominated by Northwest territory sedge (OBL) and red-tinge bulrush (OBL). The vegetation passed the dominance test and therefore indicates hydrophytic vegetation. Growth of herbaceous vegetation was extremely thick and bare soil was not visible in the majority of the wetland.
- **Soils:** Soils were determined to be hydric because of the black histic character (indicator A3) and also a strong hydrogen sulfide odor (indicator F7).
- **Hydrology:** Hydrology at the wetland sample point was evidenced by three primary indicators (presence of a high water table at a depth of 12 inches [indicator A2], saturation of the soil to the soil surface [indicator A3], and a strong hydrogen sulfide odor [indicator C1]).

Adjacent uplands, typified by sample point EA_19, contained high cover of quaking aspen (FACU) in the tree stratum. Herbaceous cover of red-tinge bulrush (OBL) was much lower and leaf litter accounted for most of the cover in the plot.

During June/July 2023, nearly the entire potential enhancement area downstream of State Route 158 was flooded, and almost all the trees had evidence of sediment deposits (indicator B2) and drift deposits (indicator B3) on the base. Because two secondary indicators were present, the upland point technically met the criteria for wetland hydrology. The 2023 snowmelt runoff was a very high water year; therefore, these indicators were considered atypical and most likely do not represent normal hydrologic conditions. Thus, the delineation required a greater reliance on soil pits and changes in the overall character of vegetation rather than hydrology indicators observed at the upland sample point.

Therefore, the mapped boundaries between upland areas and PFO_10 were primarily determined by a break in topography and the significantly reduced growth of red-tinge bulrush observed in the upland areas.

Palustrine Forested Wetland 12 (PFO_12)

PFO_12 is a palustrine forested wetland that is hydrologically connected to RC and occurs in a depression that fills with water during the high-flow season (**Map 2a**). The wetland lies in a depression compared to surrounding upland areas. The wetland is approximately 25 feet wide. The extent of the wetland in the Study Area is 0.135 acre.

This small wetland is surrounded by a dense growth of quaking aspen (FACU) and lodgepole pine (FAC) and is characterized by herbaceous species such as red-tinge bulrush (OBL), and a few Geyer's willow (OBL) were also observed growing in the middle of the wetland. A wetland point was not taken at this location because of its similarity in vegetation and topographic conditions to PFO_11.

Palustrine Forested Wetland 13 (PFO_13)

PFO_13 is a palustrine forested wetland that is hydrologically connected to RC and occurs on a low terrace above the main channel of Rush Creek that floods with water during the high-flow season (**Map 2a**). The wetland is approximately 50 feet wide. The extent of the wetland in the Study Area is 0.179 acre.

This small wetland is surrounded by a dense overstory of quaking aspen (FACU) and lodgepole pine (FAC). The herb stratum is characterized by herbaceous species such as red-tinge bulrush (OBL), and several clumps of willows (FACW – OBL) were also observed growing along the bank of Rush Creek. A wetland point was not taken at this location because of its similarity in vegetation and topographic conditions to PFO_11 and PFO_12.

Palustrine Forested Wetland 14 (PFO_14)

PFO_14 is a palustrine forested wetland that is hydrologically connected to RC and floods during the high-flow season (**Map 2a**). The wetland is approximately 50 feet wide. The extent of the wetland in the Study Area is 0.220 acre.

This wetland is characterized by growth of Geyer's willow (OBL), arroyo willow (FACW), and Lemmon's willow (FACW), with red-tinge bulrush (OBL) in the herb stratum. A few errant lodgepole pine (FAC) are scattered in the overstory. A wetland point was not taken at this location because of its similarity in vegetation and topographic conditions to PFO_15, as described more fully below.

Palustrine Forested Wetland 15 (PFO_15)

PFO_15 is a palustrine forested wetland that is hydrologically connected to RC and is located on a raised terrace above the bank (**Map 2a**). The wetland within the Study Area is approximately 75 feet wide. The extent of the wetland in the Study Area is 0.502 acre.

The wetland meets all three wetland indicators as typified by sample point EA_23:

- **Vegetation**: The tree stratum was dominated by Geyer's willow (OBL). The herb stratum was dominated by woolly sedge (*Carex pellita*) (OBL) and red-tinge bulrush (OBL). The vegetation passed the dominance test and therefore indicates hydrophytic vegetation. Growth of herbaceous vegetation was extremely thick and bare soil was not visible in the majority of the wetland.
- **Soils:** Soils were determined to be hydric because of the black histic character (indicator A3).
- **Hydrology:** Hydrology at the wetland sample point was evidenced by two primary indicators (inundation visible on aerial imagery [indicator B7] and the presence of oxidized rhizospheres along living roots [indicator C3]).

Adjacent uplands, typified by sample points EA_22 and EA_24, contained lodgepole pine (FAC) as a dominant in the tree stratum. Field horsetail (FAC) and bluejoint (FACW) were present in the understory. Therefore, these upland points met the hydrophytic vegetation requirement, but the soil and hydrology indicators were not indicative of wetlands at these sites.

During June/July 2023, nearly the entire potential enhancement area was flooded, and almost all the trees had evidence of sediment deposits (indicator B2) on the base. It is also possible that herbaceous vegetation responded quickly to the high water conditions. The 2023 snowmelt runoff was a very high water year; therefore, these indicators were considered atypical and most likely do not represent normal hydrologic conditions. Thus, the delineation required a greater reliance on soil pits, changes in the overall character of woody vegetation, and lack of multiple hydrology indicators in the uplands.

Therefore, the mapped boundaries between upland areas and PFO_15 were primarily determined by a break in topography and the lack of willows (FACW – OBL) observed growing in the upland areas.

Palustrine Forested Wetland 16 (PFO_16)

PFO_16 is a palustrine forested wetland that is hydrologically connected to RC, SRC_B, and SRC_C (**Maps 2a and 2b**). The wetland is approximately 160 feet wide. The extent of the wetland in the Study Area is 1.086 acres.

The wetland meets all three wetland indicators as typified by sample point EA_31:

- **Vegetation**: The tree stratum was dominated by Lodgepole pine (FAC). The herb stratum was dominated by tall scouring-rush (FACW) at the sample point, but red-tinge bulrush (OBL), bluejoint (FACW), and a variety of sedges (FAC – OBL) were also observed throughout the wetland. The vegetation passed the dominance test and therefore indicates hydrophytic vegetation. Growth of herbaceous vegetation was extremely thick and bare soil was not visible in the majority of the wetland.
- **Soils:** Soils were determined to be hydric because of the redox features observed below a dark surface (indicator F6).
- **Hydrology:** Hydrology at the wetland sample point was evidenced by two primary indicators (inundation visible on aerial imagery [indicator B7] and the presence of oxidized rhizospheres along living roots [indicator C3]).

Adjacent uplands, typified by sample point EA_30, also contained lodgepole pine (FAC) as a dominant in the tree stratum, but contained relatively more quaking aspen (FACU). The upland point was also taken on a gentle rise about 2 to 3 feet higher than the topography in PFO_16. Abundant leaf litter from the lodgepole pine overstory suppresses the growth of herbaceous vegetation. The presence of leaf litter in the upland areas also indicates the litter is not frequently washed away as in the wetland area.

During June/July 2023, nearly the entire potential enhancement area was flooded, and almost all the trees surrounding the upland point had evidence of sediment deposits (indicator B2) and drift deposits (indicator B3) on the base of the trees. The 2023 snowmelt runoff was a very high water year; therefore, these indicators were considered atypical and most likely do not represent normal hydrologic conditions. Thus, the delineation required a greater reliance on the observed changes in the overall character of vegetation, soil pits, and the local topography rather than hydrology indicators.

Therefore, the mapped boundaries between upland areas and PFO_16 were primarily determined by a break in topography and the lack of herbaceous vegetation growing in the upland areas.

Palustrine Forested Wetland 17 (PFO_17)

PFO_17 is a palustrine forested wetland that is hydrologically connected to SRC_B and floods with water during the high-flow season (**Map 2b**). The wetland is approximately 20 feet wide. The extent of the wetland in the Study Area is 0.030 acre.

This wetland is characterized by a patchy growth of willows (FACW – OBL) with tall scouring-rush (OBL) and sedges (FAC – OBL) in the herb stratum. Lodgepole pine (FAC) dominates the canopy overstory. A wetland point was not taken at this location because of its similarity in vegetation and topographic conditions to PFO_16, as described above.

4.2.4 Palustrine Scrub Shrub Wetlands

The Study Area contains three palustrine scrub-shrub wetlands (Cowardin Type PSS) (**Maps 2a and 2b**). Each palustrine scrub shrub wetland is described in the sections below. Refer to **Table 6** for the map abbreviation, the size of the wetland (acres within the Study Area), paired data points used to establish the boundary of the wetland, results of the wetland indicators present, and plant species observed. Photographs of these features are provided in **Appendix E** and wetland datasheets are provided in **Appendix G**.

Table 6. Summary of Palustrine Scrub Shrub Wetlands Identified in the Study Area.

Map ID	Wetland Size (Acres)	Paired Sample Points	Results of Three-Parameter Evaluation (x= parameter is present)			Representative Plant Species Observed
			Vegetation	Soils	Hydrology	
PSS_01	0.379	EA_27	X	X	X	Arroyo willow, quaking aspen, woolly sedge, red-tinge bulrush
		EA_28	X		X	Quaking aspen, red-tinge bulrush, field horsetail
PSS_02	0.044	EA_32				Lodgepole pine, blue wild rye, field horsetail
		EA_33	X	X	X	Pacific willow, red-tinge bulrush, woolly sedge
PSS_03	0.280	EA_30			X	Lodgepole pine, quaking aspen
		EA_34	X	X	X	Arroyo willow, Northwest territory sedge, Idaho bent

Palustrine Scrub Shrub Wetland 1 (PSS_01)

PSS_01 is a palustrine scrub shrub wetland that is hydrologically connected to RC (**Map 2a**). The wetland runs underneath a transmission line corridor and there is evidence of vegetation management to keep the vegetation heights below the lines (i.e., presence of large quaking aspen and lodgepole pine tree stumps within the wetland). The wetland is approximately 60 feet wide. The extent of the wetland in the Study Area is 0.379 acres.

The wetland meets all three wetland indicators as typified by sample point EA_27:

- **Vegetation**: The tree stratum was dominated by arroyo willow (FACW), with abundant growth of quaking aspen (FACU) in the sapling/shrub stratum. The herb stratum is dominated by red-tinge bulrush (OBL) and woolly sedge (OBL). The vegetation passed the dominance test and therefore indicates hydrophytic vegetation. Growth of herbaceous vegetation was extremely thick and bare soil was not visible in the majority of the wetland.

- **Soils:** Soils were determined to be hydric because of the black histic character that felt mucky and slimy to the touch (indicator A3).
- **Hydrology:** Hydrology at the wetland sample point was evidenced by three primary indicators (soil saturation to a depth of 6 inches [indicator A3], inundation visible on aerial imagery [indicator B7], and the presence of oxidized rhizospheres along living roots [indicator C3]).

Adjacent uplands, typified by sample point EA_28, were dominated by quaking aspen (FACU) in the tree stratum, with scattered lodgepole pine. The understory also contained red-tinge bulrush (OBL) and field horsetail (FAC). Though vegetation did not pass the dominance test, the prevalence index indicated hydrophytic vegetation with a value less than 3.0. Hydrology indicators such as water-stained leaves (indicator B9) and sediment/drift deposits (indicators B2 and B3) were also present. However, hydric soils were not present at this location.

During June/July 2023, nearly the entire potential enhancement area downstream of State Route 158 was flooded, and almost all the trees had evidence of sediment deposits (indicator B2) and drift deposits (indicator B3) on the base of the trees. Herbaceous vegetation may have responded quickly to the atypical flooding, compared to woody vegetation. The 2023 snowmelt runoff was a very high water year; therefore, these indicators were considered atypical and most likely do not represent normal hydrologic conditions. Thus, the delineation required a greater reliance on the observed soil conditions and patterns in woody vegetation rather than the wetland indicator status of herbaceous vegetation and hydrology indicators.

Therefore, the mapped boundaries between upland areas and PSS_01 were primarily determined by a break in topography and the lack of willows (FACW – OBL) growing in the upland areas, where quaking aspen (FACU) predominates.

Palustrine Scrub Shrub Wetland 2 (PSS_02)

PSS_02 is a palustrine scrub shrub wetland that is hydrologically connected to both SRC_C and REVCRK (**Maps 2a and 2b**). The wetland also runs underneath a transmission line corridor. The wetland is approximately 20 feet wide. The extent of the wetland in the Study Area is 0.044 acres.

The wetland meets all three wetland indicators as typified by sample point EA_33:

- **Vegetation**: The sapling/shrub stratum is dominated by Pacific willow (FACW) at a height of approximately 4 feet tall. The herb stratum is dominated by red-tinge bulrush (OBL) and woolly sedge (OBL). The vegetation passed the dominance test and therefore indicates hydrophytic vegetation. Growth of herbaceous vegetation was extremely thick and bare soil was not visible in the majority of the wetland.
- **Soils:** Soils were determined to be hydric because of the black histic character that felt mucky and slimy to the touch (indicator A3).
- **Hydrology:** Hydrology at the wetland sample point was evidenced by two primary indicators (inundation visible on aerial imagery [indicator B7], and the presence of oxidized rhizospheres along living roots [indicator C3]).

Adjacent uplands, typified by sample point EA_32, were dominated by lodgepole pine in the tree stratum. The understory was dominated by blue wild rye (FACU), with some field horsetail (FAC). The prevalence index did not indicate hydrophytic vegetation with a value greater than 3.0. Sample point EA_32 also lacked hydric soil and hydrology indicators.

Therefore, the mapped boundaries between upland areas and PSS_02 were primarily determined by a vegetation transition from willows (FACW – OBL) to a dominance of lodgepole pine (FAC).

Palustrine Scrub Shrub Wetland 3 (PSS_03)

PSS_03 is a palustrine scrub shrub wetland that is hydrologically connected to both RC, SRC_C, and REVCRK (**Map 2a**). The wetland runs underneath a transmission line corridor and there is evidence of routine vegetation management to keep vegetation heights below the lines (i.e., presence of large quaking aspen and lodgepole pine tree stumps within the wetland). The wetland is approximately 75 feet wide. The extent of the wetland in the Study Area is 0.280 acres.

The wetland meets all three wetland indicators as typified by sample point EA_34:

- **Vegetation**: The sapling/shrub stratum is dominated by arroyo willow (FACW), with abundant growth of quaking aspen (FACU) in the sapling/shrub stratum observed outside the sample point. The herb stratum is dominated by Northwest territory sedge (OBL) and Idaho bent (FACW) The vegetation passed the dominance test and therefore indicates hydrophytic vegetation. Growth of herbaceous vegetation was extremely thick and bare soil was not visible in the majority of the wetland.
- **Soils:** Soils were determined to be hydric because of a strong hydrogen sulfide odor noted when the soil was disturbed (indicator A4).
- **Hydrology:** Hydrology at the wetland sample points was evidenced by three primary indicators (inundation visible on aerial imagery [indicator B7], the presence of a hydrogen sulfide odor [indicator C1], and the presence of oxidized rhizospheres along living roots [indicator C3]).

Adjacent uplands, typified by sample point EA_30, were also dominated by lodgepole pine (FAC) in the tree stratum, but contained more quaking aspen (FACU). Abundant leaf litter from the lodgepole pine overstory suppresses the growth of herbaceous vegetation. The presence of leaf litter in the upland areas also indicates the litter is not frequently washed away as in the wetland area.

During June/July 2023, nearly the entire potential enhancement area downstream of State Route 158 was flooded, and almost all the trees near the upland point had evidence of sediment deposits (indicator B2) and drift deposits (indicator B3) on the base of the trees. The 2023 snowmelt runoff was a very high water year; therefore, these indicators were considered atypical and most likely do not represent normal hydrologic conditions. Thus, the delineation required a greater reliance on the observed changes in the overall character of vegetation rather than hydrology indicators.

Therefore, the mapped boundaries between upland areas and PSS_03 were primarily determined by a vegetation transition from willows (FACW – OBL) and high cover of herbaceous vegetation in the wetland to the predominance of lodgepole pine (FAC) and the reduced cover of herbaceous vegetation growing in the upland areas.

4.2.5 Palustrine Emergent Wetlands

Three palustrine emergent wetlands were identified in the Study Area during the field surveys (**Map 2a and Map 2b**). **Table 7**, below, provides a summary of the three wetlands including the map ID, the size of the wetland (acres within the Study Area), paired data points used to establish the boundary of the wetland, results of the wetland indicators present, and plant species observed. Because some wetlands were very similar, some delineations were made using the transition in topography and vegetation communities associated with paired data points at similar wetlands in the Study Area. Photographs of these features are provided in **Appendix E** and wetland datasheets are provided in **Appendix G**.

Table 7. Summary of Palustrine Emergent Wetlands Identified in the Study Area.

Map ID	Wetland Size (Acres)	Paired Sample Points	Results of Three-Parameter Evaluation (x= parameter is present)			Representative Plant Species Observed
			Vegetation	Soils	Hydrology	
PEM_01	0.009	EA_03	X	X	X	Red-tinge bulrush
		EA_05				Lodgepole pine, arroyo willow, quaking aspen, field horsetail
PEM_02	0.340	EA_25	X			Lodgepole pine, slender-beak sedge
		EA_26	X	X	X	Woolly sedge
PEM_03	0.024	Based on the similarity of the herbaceous vegetation layer and the topography to PSS_02 and presence within the same floodplain near Reversed Creek, the herbaceous vegetation community transition was used to delineate this wetland.				

Palustrine Emergent Wetland 1 (PEM_01)

PEM_01 is a palustrine emergent wetland that has formed on a terrace within the OHWM of RC (**Maps 2a and 2b**). The wetland is approximately 10 feet wide. The extent of wetland within the Study Area is 0.009 acre.

The wetland meets all three wetland indicators as typified by sample point EA_03:

- **Vegetation**: Herbaceous vegetation within the wetland is dominated by red-tinge bulrush (OBL) at 100 percent total cover; therefore, the vegetation passed the dominance test.
- **Soils:** Soils were determined to be hydric because it was black histic in character and released an odor of hydrogen sulfide when the soil pit was dug (indicators A3 and A4).
- **Hydrology:** Hydrology at the wetland sample point was evidenced by two primary indicators (a high water table at 2 inches [indicator A2] and saturation to the soil surface [indicator A3]).

Adjacent uplands, typified by sample point EA_05 contained some wetland species, but also contained some upland species such as quaking aspen (FACU) and Woods' rose (FACU). Sample point EA_05 lacked hydric soil indicators and hydrology. Therefore, the mapped boundaries between upland areas and wetlands were determined using topography, the vegetation transition to herbaceous dominated rather than woody dominated species. The boundaries between PEM_01 and the adjacent RC were determined based on OHWM indicators (i.e., natural break in topography creating a distinct bank line; presence of cobble and gravel in the bank of RC) and the lack of herbaceous vegetation within the active stream channel.

Palustrine Emergent Wetland 2 (PEM_02)

PEM_02 is a palustrine emergent wetland that has formed on a terrace above the OHWM of RC (**Map 2a**). It is also located underneath a transmission line corridor. The wetland is approximately 90 feet wide. The extent of wetland within the Study Area is 0.340 acre.

The wetland meets all three wetland indicators as typified by sample point EA_26:

- **Vegetation**: Herbaceous vegetation within the wetland is dominated by woolly sedge (OBL) at 100 percent total cover; therefore, the vegetation passed the dominance test.
- **Soils:** Soils were determined to be hydric because it was black histic in character (indicators A3) and contained a high level of organic material.
- **Hydrology:** Hydrology was evidenced by two primary indicators (inundation visible on aerial imagery [indicator B7] and the presence of oxidized rhizospheres along living roots [indicator C3]).

Adjacent uplands, typified by sample point EA_25, are located above a gentle rise about 2 feet higher than sample point EA_26. Vegetation is dominated by lodgepole pine (FAC) and slender-beak sedge (*Carex athrostachya*) (FACW). While these species indicate hydrophytic vegetation, this point lacked accompanying hydric soil indicators and hydrology indicators. Therefore, the mapped boundaries between upland areas and wetlands were determined using topography and the presence of lodgepole pine (FAC) in the overstory.

Palustrine Emergent Wetland 3 (PEM_03)

PEM_03 is a palustrine emergent wetland that has formed on a terrace above the OHWM above REVCRK (**Map 2a**). It is also located underneath a transmission line corridor. The wetland is approximately 20 feet wide and extends from REVCRK to the eastern boundary of the Study Area. The extent of the wetland within the Study Area is 0.024 ace.

This wetland is characterized by the herbaceous species that were found in the herb stratum of sample point EA_33, including red-tinge bulrush (OBL) and woolly sedge (OBL), with a lesser amount of field horsetail (FAC). PEM_03 does not contain any shrubs or trees. A wetland point was not taken at this location because of the similarity to PSS_03 in the herbaceous vegetation layer and the similar topography of the wetland. To the north of the wetland, a slight rise creates a transition to lodgepole pine (FAC) overstory and denotes the northern edge of the wetland.

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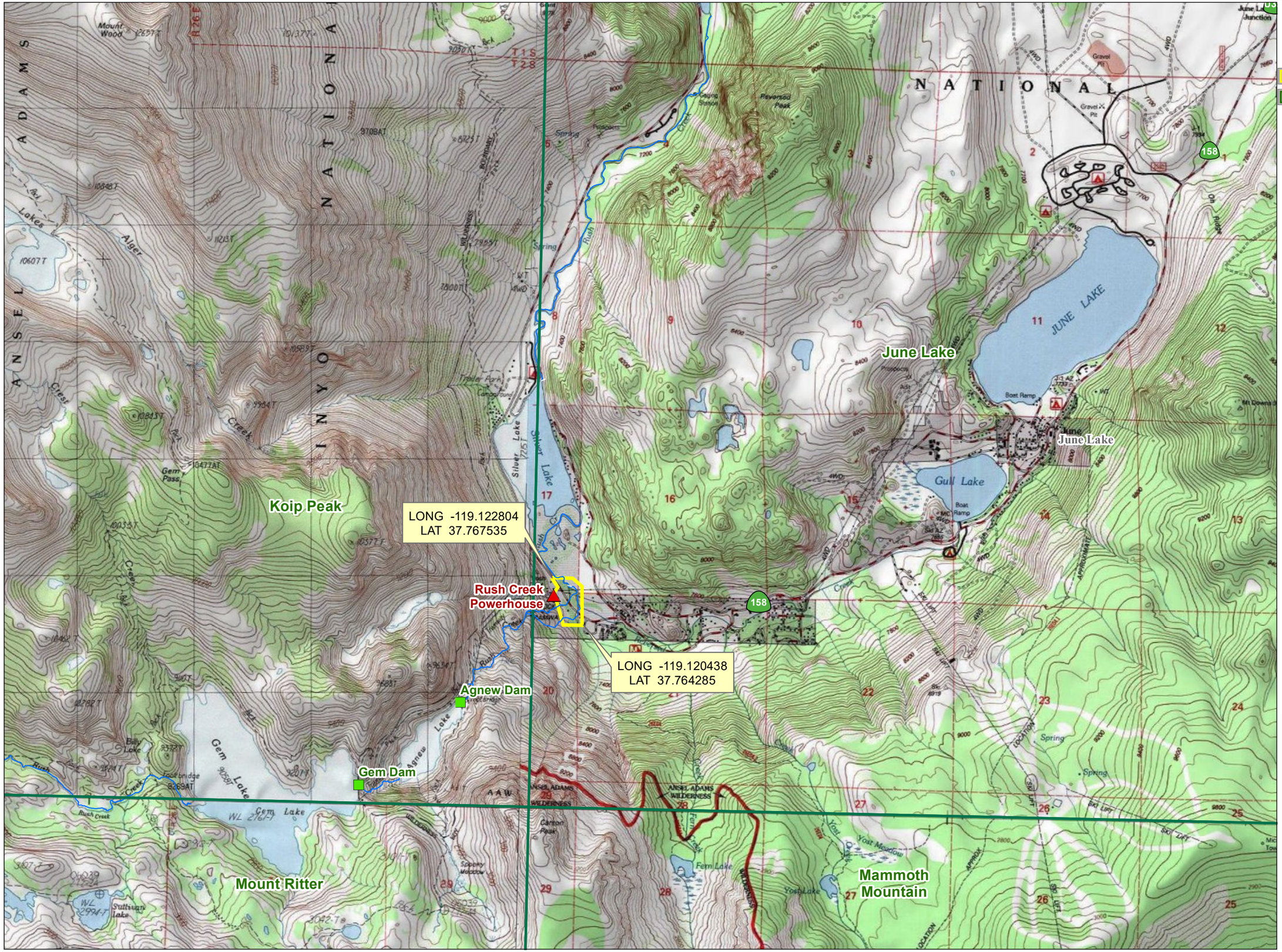
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Map 1.

Study Area Location


ANSEL ADAMS WILDERNESS
INYO NATIONAL
Mount Wood
Lakes
Alger
Crest
Creek
Gem Pass
Koip Peak
Rush Creek
Trail
Trail Camp
Silver Lake
Silver Lake
Reversed Peak
Spring
Prospects
Gravel Pit
Rush Creek
Spring
June Lake
JUNE LAKE
Boat Ramp
June Lake
Gull Lake
Boat Ramp
158
LONG -119.122804
LAT 37.767535
Rush Creek Powerhouse
LONG -119.120438
LAT 37.764285
Agnew Dam
Gem Dam
Billy Lake
Gem Lake
WL 2787
Foot bridge
Rush Creek
Agnew Lake
Carson Peak
Fern Lake
Yost Meadow
Yost Lake
Mammoth Mountain
Mount Ritter
Sotcher Lake
WL 2994
Ski Lift
Ski Lift
Ski Lift
Ski Lift
Spring
Spring
Spring
Spring
Creek
Creek
Creek

Map 2a and 2b.

Aquatic Resources in the Rush Creek Project Potential Enhancement Area



SCE Facilities

- Powerhouse
- Ancillary Facility
- Helicopter Landing Site
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- FERC Project Boundary

Other Features

- Potential Enhancement Area Study Area

Delineated Features

Ordinary High Water Mark (OHWM)

- Perennial Stream
- Perennial Stream Culvert*
- Intermittent Stream
- Transect with Width (Ft) at OHWM

* For individual SR-158 culvert dimensions, see Appendix J

Wetlands

- Wetland Data Points
- PEM - Palustrine Emergent Wetland
- PFO - Palustrine Forested Wetland
- PSS - Palustrine Scrub Shrub Wetland

Map Preparer
Eric Lee, Stantec

Delineators
Robyn Smith, JNA, Matt Tomaszewski, Stantec

Preparation Date:
4/18/2024

SOUTHERN CALIFORNIA EDISON®
An EDISON INTERNATIONAL® Company

Rush Creek Project (FERC 1389)

Map 2a

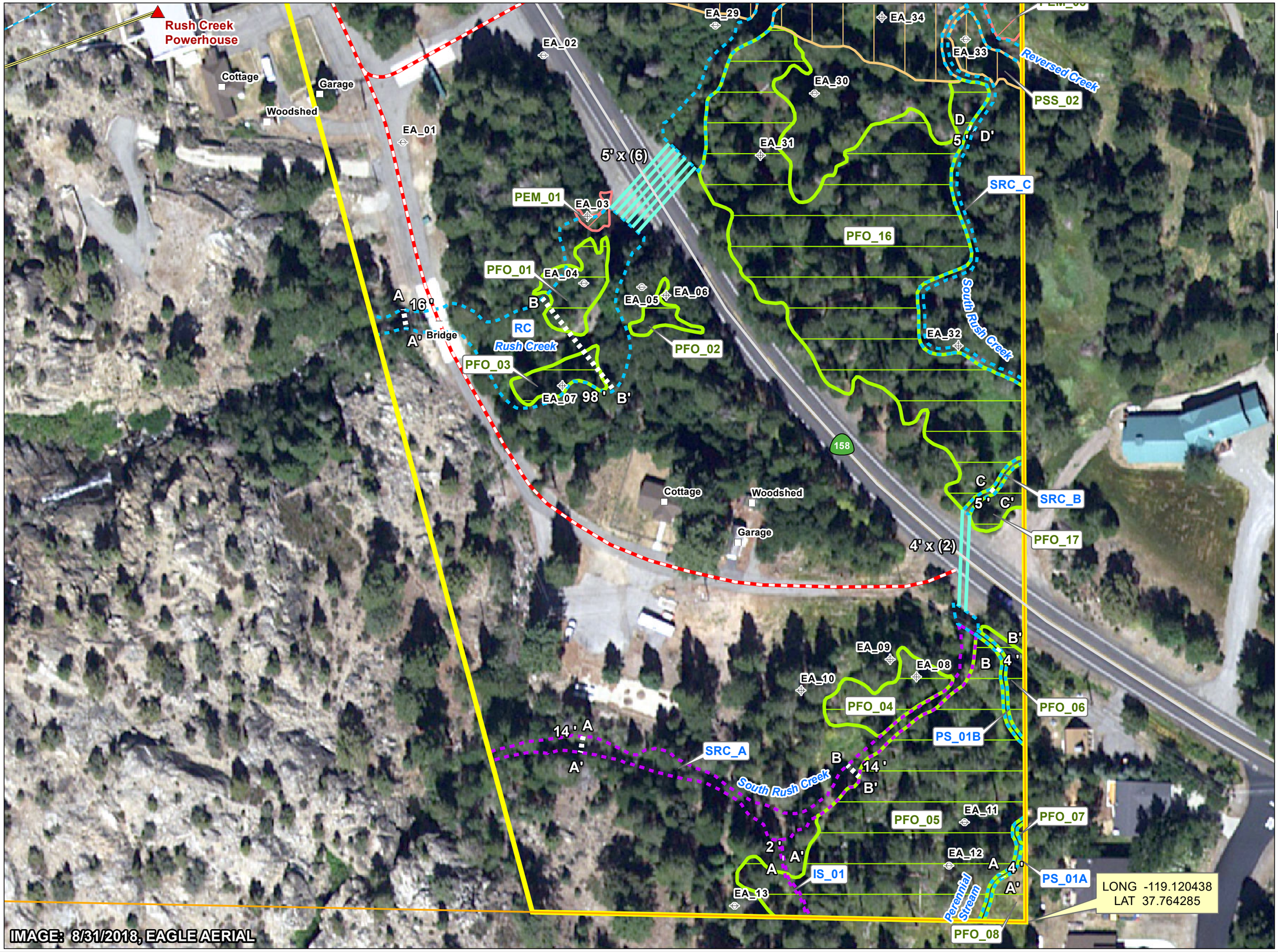
Aquatic Resources in the Rush Creek Project Potential Enhancement Area

0 25 50 100 Feet
1 inch = 75 feet
Projection: UTM Zone 11
Datum: NAD 83

Date: 4/18/2024

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SCE Facilities

- Powerhouse
- Ancillary Facility
- Helicopter Landing Site
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- FERC Project Boundary

Other Features

- Potential Enhancement Area Study Area

Delineated Features

Ordinary High Water Mark (OHWM)

- Perennial Stream
- Perennial Stream Culvert*
- Intermittent Stream
- Transect with Width (Ft) at OHWM

* For individual SR-158 culvert dimensions, see Appendix J

Wetlands

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- PSS - Palustrine Scrub Shrub Wetland

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Delineators
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Preparation Date:
4/18/2024

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Rush Creek Project (FERC 1389)

Map 2b

Aquatic Resources in the Rush Creek Project Potential Enhancement Area

0 25 50 100 Feet

1 inch = 75 feet

Projection: UTM Zone 11
Datum: NAD 83

Date: 4/18/2024

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Map 3a and 3b.

Aquatic Resource Photograph Locations



SCE Facilities

- Powerhouse
- Ancillary Facility
- Helicopter Landing Site
- Flowline / Penstock
- Power or Communication Line
- Tramway
- Project Road
- FERC Project Boundary

Other Features

- Potential Enhancement Area Study Area
- Photo Location w/Direction

Delineated Features

Ordinary High Water Mark (OHWM)

- Perennial Stream
- Perennial Stream Culvert*
- Intermittent Stream
- Transect with Width (Ft) at OHWM

* For individual SR-158 culvert dimensions, see Table X.X

Wetlands

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- PSS - Palustrine Scrub Shrub Wetland

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Preparation Date:
4/19/2024

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Rush Creek Project (FERC 1389)

Map 3a

Aquatic Resource Photograph Locations

0 25 50 100 Feet

1 inch = 75 feet

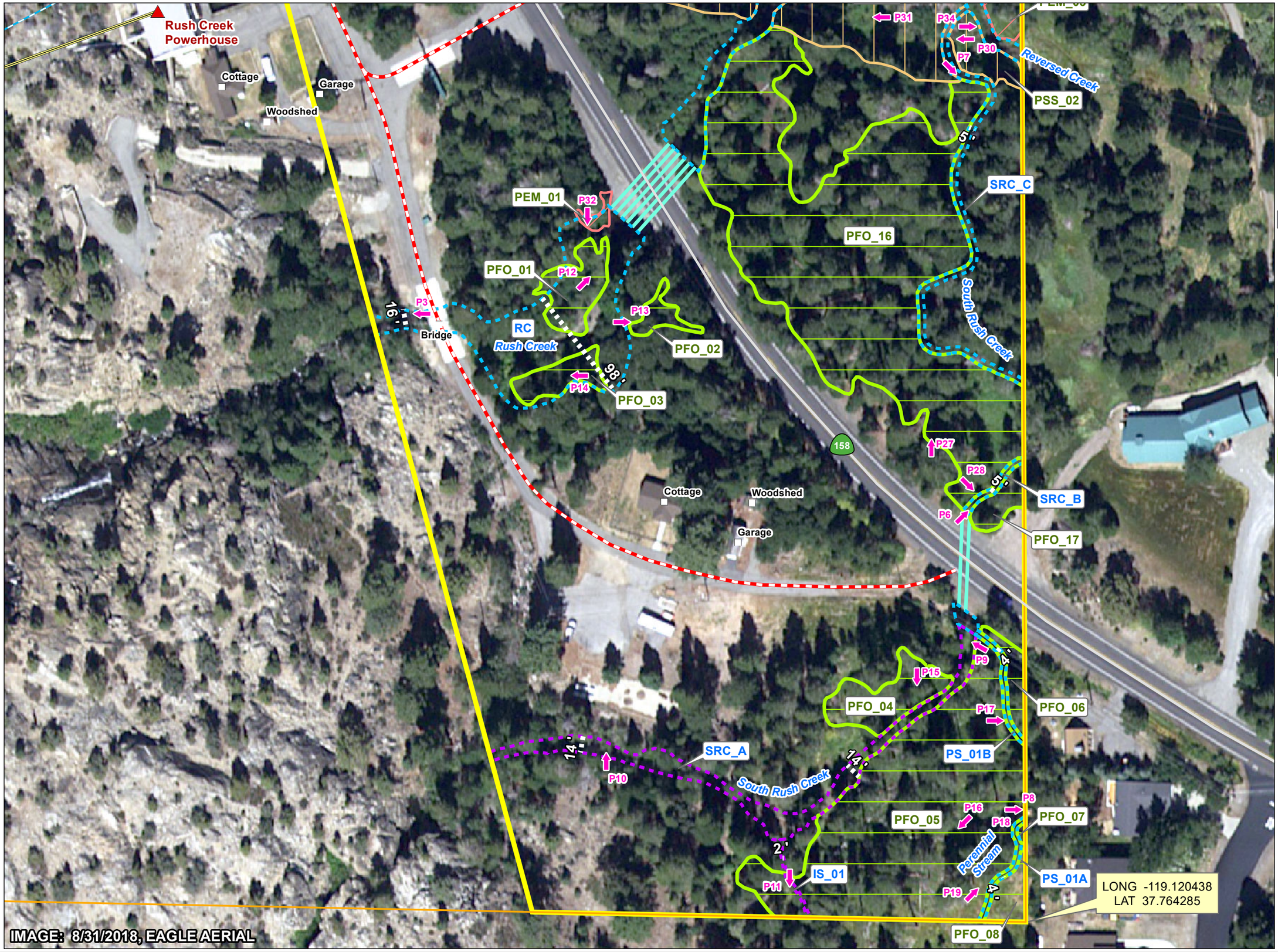
Projection: UTM Zone 11
Datum: NAD 83

Date: 4/19/2024

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SCE Facilities

- Powerhouse
- Ancillary Facility
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4/19/2024

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Rush Creek Project (FERC 1389)

Map 3b

Aquatic Resource Photograph Locations

0 25 50 100 Feet
1 inch = 75 feet
Projection: UTM Zone 11
Datum: NAD 83
Date: 4/19/2024

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Appendix A.

Signed Statement from Southern California Edison Company Regarding Access

In the event that the U.S. Army Corps of Engineers determines that a site inspection is necessary, the Study Area is located on private lands owned by the Southern California Edison Company and other private landowners. Please contact Matthew Woodhall at matthew.woodhall@sce.com to coordinate access to the site.

Printed Name	Date
Signature	Title

Appendix B.

Web Soil Survey Query Results

Soil Map—Benton-Owens Valley Area Parts of Inyo and Mono Counties, California; and Inyo National Forest, Western Part, California
(Rush Creek Enhancement Area NRCS Soil Search)



119° 7' 28" W
37° 46' 10" N
312890
312970
313050
313130
313210
313290
313370
119° 7' 7" W
4182340
4182260
4182180
4182100
4182020
4181940
4181860
4181780
4181700
4181620
4181540
37° 45' 42" N

Map Scale: 1:2,380 if printed on B portrait (11" x 17") sheet.

N

Meters: 0, 35, 70, 140, 210

Feet: 0, 100, 200, 400, 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 11N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Benton-Owens Valley Area Parts of Inyo and Mono Counties, California
Survey Area Data: Version 21, Aug 30, 2023

Soil Survey Area: Inyo National Forest, Western Part, California
Survey Area Data: Version 13, Aug 30, 2023

Your area of interest (AOI) includes more than one soil survey area. These survey areas may have been mapped at different scales, with a different land use in mind, at different times, or at different levels of detail. This may result in map unit symbols, soil properties, and interpretations that do not completely agree across soil survey area boundaries.

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Oct 9, 2022—Oct 25, 2022

MAP LEGEND

MAP INFORMATION

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
170	Conway-Conway cobbly-Chesaw family association, 0 to 15 percent slopes	27.1	54.0%
177	Cryorthents-Rock outcrop complex, 30 to 50 percent slopes	17.8	35.4%
Subtotals for Soil Survey Area		**44.8**	**89.4%**
Totals for Area of Interest		**50.2**	**100.0%**

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
129bo	Berent-Glenbrook-Nanamkin families association, 30 to 50 percent slopes	0.1	0.1%
170bo	Conway-Conway cobbly-Chesaw family association, 0 to 15 percent slopes	5.3	10.5%
Subtotals for Soil Survey Area		**5.3**	**10.6%**
Totals for Area of Interest		**50.2**	**100.0%**

Benton-Owens Valley Area Parts of Inyo and Mono Counties, California

170—Conway-Conway cobbly-Chesaw family association, 0 to 15 percent slopes

Map Unit Setting

National map unit symbol: jcvz
Elevation: 6,000 to 8,600 feet
Mean annual precipitation: 9 to 40 inches
Mean annual air temperature: 39 to 54 degrees F
Frost-free period: 70 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Conway and similar soils: 35 percent
Conway and similar soils: 30 percent
Chesaw family and similar soils: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conway

Setting

Landform: Fan terraces, alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash and/or alluvium derived from granite

Typical profile

H1 - 0 to 4 inches: sandy loam
H2 - 4 to 42 inches: cobbly sandy loam
H3 - 42 to 60 inches: very cobbly coarse sandy loam

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: OccasionalNone
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 6w

Hydrologic Soil Group: A/D
Ecological site: R026XF010CA - Wet Meadow
Hydric soil rating: Yes

Description of Conway

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, convex, linear
Parent material: Volcanic ash and alluvium derived from granite

Typical profile

H1 - 0 to 4 inches: cobbly sandy loam
H2 - 4 to 42 inches: cobbly sandy loam
H3 - 42 to 60 inches: very cobbly coarse sandy loam

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: OccasionalNone
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A/D
Ecological site: R026XF619CA - Aspen Slopes (BLM)
Hydric soil rating: Yes

Description of Chesaw Family

Setting

Landform: Fan terraces, alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Convex, linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 5 inches: gravelly loamy sand
H2 - 5 to 27 inches: very gravelly loamy sand
H3 - 27 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 15 percent

Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Unnamed, histosols

Percent of map unit: 8 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Unnamed, flooded

Percent of map unit: 7 percent
Landform: Drainageways
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Benton-Owens Valley Area Parts of Inyo and Mono Counties, California
Survey Area Data: Version 21, Aug 30, 2023

Soil Survey Area: Inyo National Forest, Western Part, California
Survey Area Data: Version 13, Aug 30, 2023

Inyo National Forest, Western Part, California

170bo—Conway-Conway cobbly-Chesaw family association, 0 to 15 percent slopes

Map Unit Setting

National map unit symbol: 2dtlp
Elevation: 6,000 to 8,600 feet
Mean annual precipitation: 9 to 40 inches
Mean annual air temperature: 39 to 54 degrees F
Frost-free period: 70 to 140 days
Farmland classification: Not prime farmland

Map Unit Composition

Conway and similar soils: 35 percent
Conway and similar soils: 30 percent
Chesaw family and similar soils: 15 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Conway

Setting

Landform: Fan terraces, alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Volcanic ash and/or alluvium derived from granite

Typical profile

H1 - 0 to 4 inches: sandy loam
H2 - 4 to 42 inches: cobbly sandy loam
H3 - 42 to 60 inches: very cobbly coarse sandy loam

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: OccasionalNone
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.1 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A/D

Ecological site: R026XF010CA - Wet Meadow
Hydric soil rating: Yes

Description of Conway

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Concave, linear
Across-slope shape: Concave, convex, linear
Parent material: Volcanic ash and alluvium derived from granite

Typical profile

H1 - 0 to 4 inches: cobbly sandy loam
H2 - 4 to 42 inches: cobbly sandy loam
H3 - 42 to 60 inches: very cobbly coarse sandy loam

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Poorly drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 6 to 24 inches
Frequency of flooding: OccasionalNone
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 5.0 inches)

Interpretive groups

Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 6w
Hydrologic Soil Group: A/D
Ecological site: R026XF619CA - Aspen Slopes (BLM)
Hydric soil rating: Yes

Description of Chesaw Family

Setting

Landform: Fan terraces, alluvial fans
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Convex, linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 5 inches: gravelly loamy sand
H2 - 5 to 27 inches: very gravelly loamy sand
H3 - 27 to 60 inches: gravelly loamy sand

Properties and qualities

Slope: 0 to 15 percent
Depth to restrictive feature: More than 80 inches

Drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 2.8 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Unnamed, histosols

Percent of map unit: 8 percent
Landform: Alluvial fans
Hydric soil rating: Yes

Unnamed, flooded

Percent of map unit: 7 percent
Landform: Drainageways
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Benton-Owens Valley Area Parts of Inyo and Mono Counties, California
Survey Area Data: Version 21, Aug 30, 2023

Soil Survey Area: Inyo National Forest, Western Part, California
Survey Area Data: Version 13, Aug 30, 2023

Benton-Owens Valley Area Parts of Inyo and Mono Counties, California

177—Cryorthents-Rock outcrop complex, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: jcw6
Elevation: 9,800 to 11,000 feet
Mean annual precipitation: 15 to 20 inches
Mean annual air temperature: 39 to 43 degrees F
Frost-free period: 30 to 75 days
Farmland classification: Not prime farmland

Map Unit Composition

Cryorthents and similar soils: 60 percent
Rock outcrop: 25 percent
Minor components: 2 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cryorthents

Setting

Landform: Mountains
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Mountainflank
Down-slope shape: Concave, convex
Across-slope shape: Concave, convex, linear
Parent material: Colluvium derived from granite and residuum weathered from granite

Typical profile

H1 - 0 to 4 inches: gravelly sandy loam
H2 - 4 to 21 inches: very gravelly loamy coarse sand
H3 - 21 to 25 inches: bedrock
H4 - 25 to 31 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Surface area covered with cobbles, stones or boulders: 25.0 percent
Depth to restrictive feature: 20 to 40 inches to lithic bedrock
Drainage class: Well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 1.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydrologic Soil Group: B
Hydric soil rating: No

Description of Rock Outcrop

Setting

Landform: Plateaus, mountains
Parent material: Granite

Typical profile

H1 - 0 to 10 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: 0 inches to lithic bedrock

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 8
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 2 percent
Landform: Intermontane basins
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Benton-Owens Valley Area Parts of Inyo and Mono Counties, California
Survey Area Data: Version 21, Aug 30, 2023

Soil Survey Area: Inyo National Forest, Western Part, California
Survey Area Data: Version 13, Aug 30, 2023

Inyo National Forest, Western Part, California

129bo—Berent-Glenbrook-Nanamkin families association, 30 to 50 percent slopes

Map Unit Setting

National map unit symbol: 2dtkv
Elevation: 5,600 to 7,500 feet
Mean annual precipitation: 10 to 12 inches
Mean annual air temperature: 39 to 52 degrees F
Frost-free period: 110 to 150 days
Farmland classification: Not prime farmland

Map Unit Composition

Berent family and similar soils: 40 percent
Glenbrook family and similar soils: 30 percent
Nanamkin family and similar soils: 15 percent
Minor components: 1 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Berent Family

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave, convex
Parent material: Colluvium derived from granite and residuum weathered from granite

Typical profile

H1 - 0 to 2 inches: gravelly loamy coarse sand
H2 - 2 to 13 inches: gravelly loamy coarse sand
H3 - 13 to 60 inches: gravelly loamy coarse sand

Properties and qualities

Slope: 30 to 50 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Low (about 3.6 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e

Hydrologic Soil Group: A
Ecological site: R029XG033CA - Granitic Slope (BLM)
Hydric soil rating: No

Description of Glenbrook Family

Setting

Landform: Hillsides
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave, convex
Parent material: Colluvium and/or residuum weathered from granite

Typical profile

H1 - 0 to 11 inches: bouldery loamy coarse sand
H2 - 11 to 15 inches: bedrock

Properties and qualities

Slope: 30 to 50 percent
Surface area covered with cobbles, stones or boulders: 12.0 percent
Depth to restrictive feature: 10 to 20 inches to paralithic bedrock
Drainage class: Somewhat excessively drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 0.7 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: D
Ecological site: R029XG030CA - Granitic Fan (BLM)
Hydric soil rating: No

Description of Nanamkin Family

Setting

Landform: Hills
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope
Down-slope shape: Concave
Across-slope shape: Concave, convex
Parent material: Colluvium derived from granite and/or residuum weathered from granite

Typical profile

H1 - 0 to 7 inches: very cobbly loamy sand
H2 - 7 to 60 inches: very cobbly loamy sand

Properties and qualities

Slope: 30 to 50 percent
Surface area covered with cobbles, stones or boulders: 18.0 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): High to very high (6.00 to 20.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very low (about 3.0 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Ecological site: R029XG034CA - Steep Sandy Slope (BLM)
Hydric soil rating: No

Minor Components

Unnamed

Percent of map unit: 1 percent
Landform: Drainageways
Hydric soil rating: Yes

Data Source Information

Soil Survey Area: Benton-Owens Valley Area Parts of Inyo and Mono Counties, California
Survey Area Data: Version 21, Aug 30, 2023

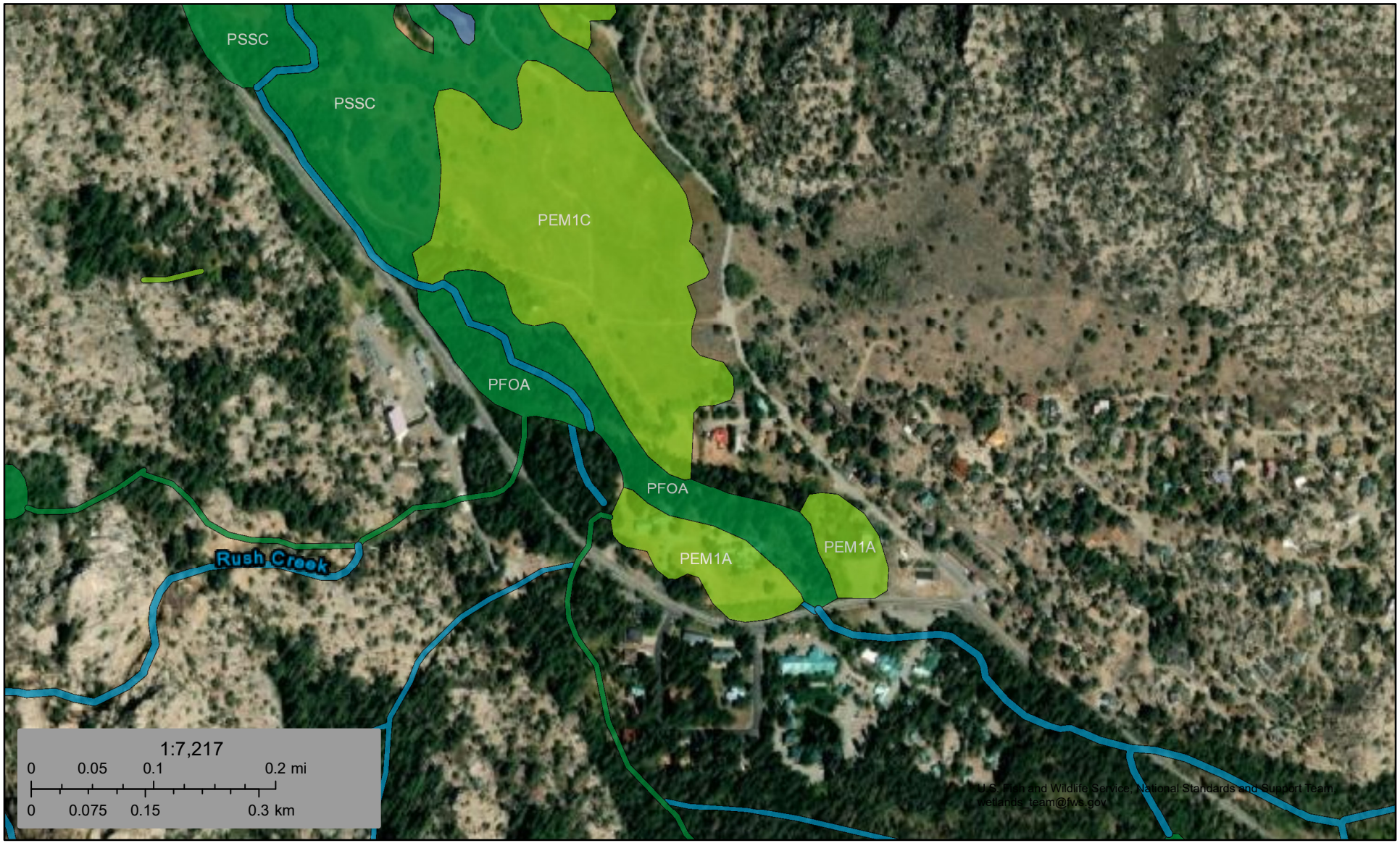
Soil Survey Area: Inyo National Forest, Western Part, California
Survey Area Data: Version 13, Aug 30, 2023

Appendix C

National Wetlands Inventory Query Results

U.S. Fish and Wildlife Service
National Wetlands Inventory

Rush Creek Project Enhancement Area



October 2, 2023

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

Appendix D.

WETS Tables for Lee Vining, CA

WETS Station: LEE VINING, CA

Requested years: 2002 - 2022

Month	Temperature (°F)			Precipitation (inches)				
	Avg daily max	Avg daily min	Avg daily mean	Avg	30% chance will have		Avg number of days with 0.10 inch or more	Average total snowfall
					less than	more than		
Jan	41.0	20.7	30.8	2.57	0.81	2.92	4	19.7
Feb	44.8	22.3	33.5	1.91	0.81	2.19	4	14.0
Mar	51.9	27.5	39.7	1.34	0.52	1.63	3	9.7
Apr	58.9	32.8	45.9	0.74	0.28	0.83	2	3.1
May	66.8	39.1	52.9	0.82	0.28	0.94	2	1.2
Jun	78.2	48.0	63.1	0.32	0.13	0.35	1	0.0
Jul	85.8	54.7	70.2	0.60	0.23	0.70	2	0.0
Aug	83.6	52.4	68.0	0.46	0.15	0.46	1	0.0
Sep	77.0	45.7	61.4	0.30	0.09	0.29	1	0.0
Oct	65.0	35.5	50.2	0.88	0.26	0.87	2	1.1
Nov	53.2	28.0	40.6	1.20	0.52	1.47	2	5.0
Dec	42.1	22.1	32.1	2.76	1.48	3.26	5	17.3
Annual:					10.82	16.07		
Average	62.4	35.7	49.0	-	-	-	-	-
Total	-	-	-	13.90			30	71.0

GROWING SEASON DATES

Requested years of data:	2002 - 2022		
Years with missing data:	24 deg = 0	28 deg = 0	32 deg = 0
Years with no occurrence:	24 deg = 0	28 deg = 0	32 deg = 0
Data years used:	24 deg = 21	28 deg = 21	32 deg = 21

Probability	Temperature		
	24 F or higher	28 F or higher	32 F or higher

Appendix E.

Study Area Photographs

Appendix E. Study Area Photographs

Perennial Streams (Cowardin Type R2UB)



Photo 1. Rush Creek Powerhouse Tailrace (TR) looking downstream from the culvert over State Route 158 characterized by an OHWM (Ordinary High Water Mark) of 24 to 26 feet and a cobble-gravel channel. Photo taken facing northeast from UTM coordinates 313072.02 meters east and 4182075.86 meters north in the zone 11S.



Photo 2. TR at the intersection of with Rush Creek above Silver Lake (RC). Photo taken facing northwest from the south shore of RC at UTM coordinates 313097.38 meters east and 4182096.40 meters north in the zone 11S.

Appendix E. Study Area Photographs



Photo 3. RC looking upstream from the bridge within the Rush Creek Powerhouse area, characterized by an OHWM of approximately 16 feet. Photo taken facing west at UTM coordinates 313070.80 meters east and 4181936.14 meters north in the zone 11S.



Photo 4. RC in the northern side of the Study Area characterized by an OHWM of approximately 20 to 30 feet. Photo taken facing northwest from the east bank of Rush Creek at UTM coordinates 313091.91 meters east and 4182128.54 meters north in the zone 11S.

Appendix E. Study Area Photographs



Photo 5. Reversed Creek (REVCRK) near the intersection with RC characterized by an OHWM of approximately 12 feet. Photo taken facing northwest at UTM coordinates 313201.96 meters east and 4182031.44 meters north in the zone 11S.



Photo 6. South Rush Creek Segment B (SRC_B) near the culvert under State Route 158 characterized by an OHWM of approximately 5 feet. Photo taken facing northeast at UTM coordinates 313209.66 meters east and 4181883.82 meters north in the zone 11S.

Appendix E. Study Area Photographs



Photo 7. South Rush Creek C (SRC_C) near the intersection with REVCRK characterized by an OHWM of approximately 5 feet. Photo facing southeast from UTM coordinates 313206.62 meters east and 4181999.27 meters north in the zone 11S.



Photo 8. Perennial Stream Segment A (PS_01A) midway with PFO_07 visible on the east bank, characterized by an OHWM of approximately 4 feet. Photo taken facing east from UTM coordinates 313222.92 meters east and 4181808.55 meters north in the zone 11S.

Appendix E. Study Area Photographs



Photo 9. Perennial Stream Segment B (PS_01B) near convergence with South Rush Creek at culverts under Highway 158 characterized by an OHWM of approximately 4 feet. Photo taken facing northwest at UTM coordinates 313216.61 meters east and 4181844.25 meters north in the zone 11S.

Intermittent Stream (Cowardin Type R4SB)



Photo 10. South Rush Creek Segment A (SRC_A) characterized by an OHWM (shown by the red dashed lines) of approximately 14 to 15 feet. This portion of SRC had very low flows at the time of the survey. Photo taken facing north at UTM coordinates 313118.14 meters east and 4181820.87 meters north in the zone 11S.

Appendix E. Study Area Photographs

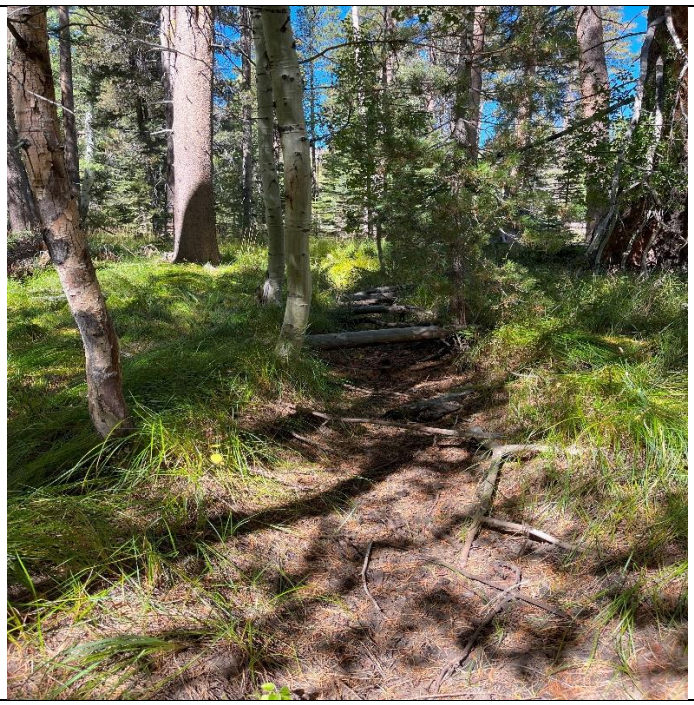


Photo 11. Intermittent Stream 1 (IS_01) characterized by an OHWM of approximately 2 feet. This portion of IS_01 was dry at the time of the survey. Phot taken facing south at UTM coordinates 313165.32 meters east and 4181790.98 meters north in the zone 11S.

Palustrine Forested Wetlands (Cowardin Type PFO)



Photo 12. Palustrine Forested Wetland 1 (PFO_01) formed within the OHWM of RC is dominated by wetland associated vegetation such as Lemmon's willow, field horsetails, and tall scouring-rush with a high canopy cover of lodgepole pine. Photo taken facing northeast at UTM coordinates 313112.39 meters east and 4181944.00 meters north in the zone 11S.

Appendix E. Study Area Photographs



Photo 13. Palustrine Forested Wetland 2 (PFO_02) formed within the OHWM of RC is dominated by wetland associated vegetation such as arroyo willow and bluejoint with a high canopy cover of lodgepole pine and quaking aspen. Photo taken facing east from UTM coordinates 313122.19 meters east and 4181933.87 meters north in the zone 11S.



Photo 14. Palustrine Forested Wetland 3 (PFO_03) formed within a depression adjacent to RC is dominated by wetland associated vegetation such as arroyo willow and field horsetail with a high canopy cover of lodgepole pine and quaking aspen. Photo taken facing west from UTM coordinates 313111.33 meters east and 4181920.16 meters north in the zone 11S.

Appendix E. Study Area Photographs



Photo 15. Palustrine Forested Wetland 4 (PFO_04) formed in a depression adjacent to SRC_A is dominated by wetland associated vegetation such as arroyo willow, Northwest territory sedge, and red-tinged bulrush with a canopy of lodgepole pine. Photo taken facing south from UTM coordinates 313198.04 meters east and 4181842.71 meters north



Photo 16. Palustrine Forested Wetland 5 (PFO_05) formed in the floodplain between SRC_A and PS_01 is dominated by wetland associated vegetation such as red-tinge bulrush, bluejoint, field horsetail, Idaho bent, and tall manna grass with a canopy cover dominated by lodgepole pine. Photo taken facing southwest from UTM coordinates 313210.33 meters east and 4181805.36 meters north in the zone 11S.

Appendix E. Study Area Photographs



Photo 17. Palustrine Forested Wetland 6 (PFO_06) east of PS_01B is dominated by wetland associated vegetation such as willow species, sedges, and red-tinge bulrush. Photo taken facing east from UTM coordinates 313218.17 meters east and 4181831.36 meters north in the zone 11S.



Photo 18. Palustrine Forested Wetland 7 (PFO_07) east of PS_01A is dominated by wetland associated vegetation such as red-tinge bulrush, bluejoint, and Idaho bent (on right bank in photograph). Photo taken facing east from UTM coordinates 313222.92 meters east and 4181808.55 meters north in the zone 11S.

Appendix E. Study Area Photographs



Photo 19. Palustrine Forested Wetland 8 (PFO_08) east of PS_01B is dominated by wetland associated vegetation such as red-tinge bulrush, bluejoint, and Idaho bent (on right bank in photograph). Photo taken facing northeast from UTM coordinates 313212.23 meters east and 4181786.64 meters north in the zone 11S.



Photo 20. Palustrine Forested Wetland 9 (PFO_09) is hydrologically connected to TR and is dominated by wetland associated vegetation such as red-tinge bulrush with a canopy cover of quaking aspen and Lemmon's willow. Photo taken facing south from UTM coordinates 313065.72 meters east and 4182033.17 meters north in the zone 11S.

Appendix E. Study Area Photographs



Photo 21. Palustrine Forested Wetland 10 (PFO_10) hydrologically connected to RC and contains wetland associated vegetation such as Geyer's willow, Pacific willow, arroyo willow, Northwest territory sedge, red-tinge bulrush and bluejoint. Photo taken facing southeast from UTM coordinates 313069.83 meters east and 4182121.22 meters north in the zone 11S.



Photo 22. Palustrine Forested Wetland 11 (PFO_11) is hydrologically connected to RC and is dominated by wetland associated vegetation such as Northwest territory sedge and red-tinge bulrush with a canopy of quaking aspen. Photo taken facing east from UTM coordinates 313102.26 meters east and 4182085.39 meters north in the zone 11S.

Appendix E. Study Area Photographs



Photo 23. Palustrine Forested Wetland 12 (PFO_12) is hydrologically connected to RC and contains wetland associated vegetation such as red-tinge bulrush and Geyer's willow with a dense canopy of quaking aspen. Photo taken facing southeast from UTM coordinates 313126.74 meters east and 4182079.93 meters north in the zone 11S.



Photo 24. Palustrine Forested Wetland 13 (PFO_13) hydrologically connected to RC is characterized by wetland associated vegetation such as red-tinge bulrush and willow species with a dense canopy of lodgepole pine and quaking aspen. Photo taken facing north from UTM coordinates 313188.53 meters east and 4182032.11 meters north in the zone 11S.

Appendix E. Study Area Photographs



Photo 25. Palustrine Forested Wetland 14 (PFO_14) is hydrologically connected to RC and is characterized by wetland associated vegetation such as Geyer's willow, arroyo willow, Lemmon's willow, and red-tinge bulrush with a few lodgepole pines. PFO_14 is located in the forested area behind the herbaceous clearing in the photo. Photo taken facing north from UTM coordinates 313134.45 meters east and 4182104.74 meters north in the zone 11S.



Photo 26. Palustrine Forested Wetland 15 (PFO_15) is hydrologically connected to RC and is characterized by wetland associated vegetation such as Geyer's willow, wooly sedge, and red-tinge bulrush. Photo taken facing north from UTM coordinates 313153.03 meters east and 4182091.81 meters north in the zone 11S.

Appendix E. Study Area Photographs



Photo 27. Palustrine Forested Wetland 16 (PFO_16) is hydrologically connected to RC, SRC_B and SRC_C, and is characterized by wetland associated vegetation such as tall scouring-rush, red-tinge bulrush, and bluejoint with a canopy of lodgepole pine. Photo taken facing north from UTM coordinates 313201.79 meters east and 4181901.52 meters north in the zone 11S.



Photo 28. Palustrine Forested Wetland 17 (PFO_17) is hydrologically connected to SRC and is characterized by wetland associated vegetation such as willows, tall scouring-rush, and sedges with a canopy of lodgepole pine. Photo taken facing southeast from UTM coordinates 313211.07 meters east and 4181892.22 meters north in the zone 11S.

Appendix E. Study Area Photographs

Palustrine Scrub Shrub Wetlands (Cowardin Type PSS)

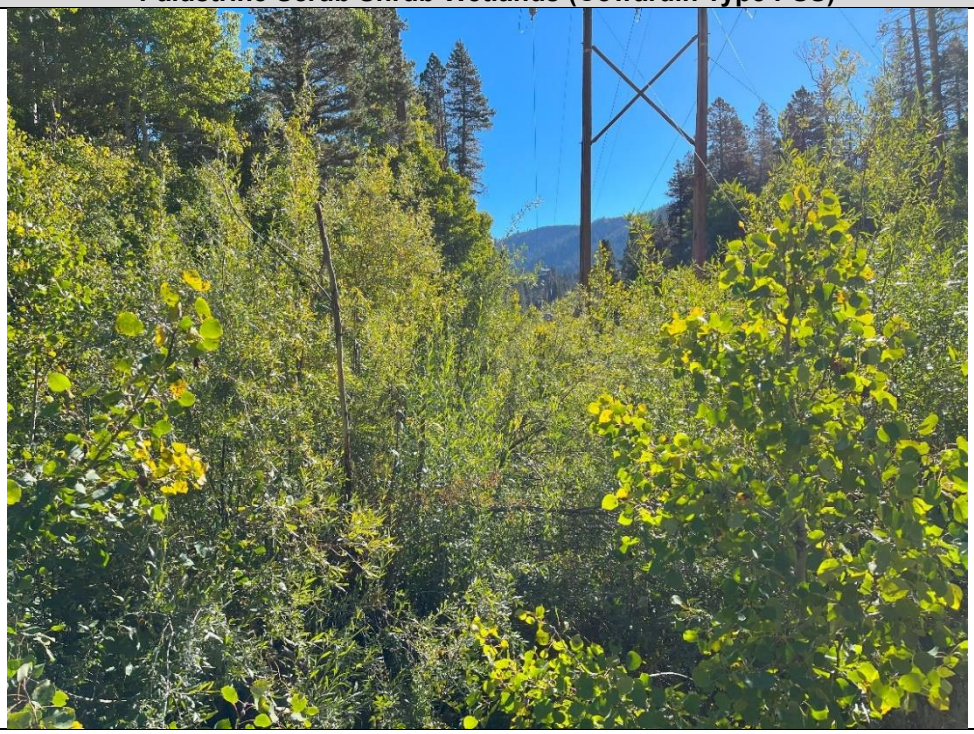


Photo 29. Palustrine Scrub Shrub Wetland 1 (PSS_01) is hydrologically connected to RC and is characterized by wetland associated vegetation such as arroyo willow, red-tinge bulrush, and woolly sedge with quaking aspen saplings. Photo taken facing west from UTM coordinates 313123.31 meters east and 4182034.44 meters north in the zone 11S.



Photo 30. Palustrine Scrub Shrub Wetland 2 (PSS_02) is hydrologically connected to SRC_C and REVCRK and is characterized by wetland associated vegetation such as Pacific willow, red-tinge bulrush, and woolly sedge. Photo taken facing west from UTM coordinates 313210.58 meters east and 4182006.74 meters north in the zone 11S.

Appendix E. Study Area Photographs

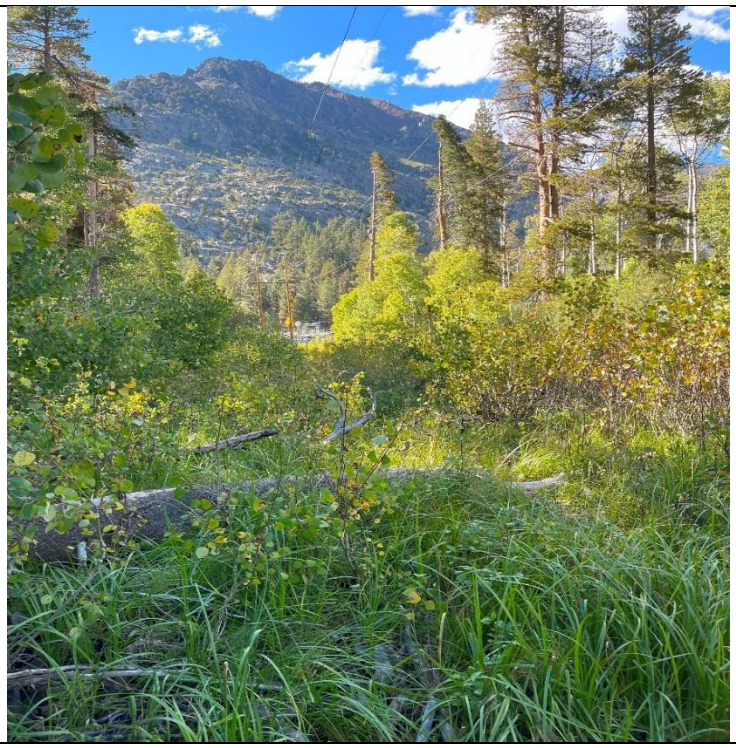


Photo 31. Palustrine Scrub Shrub Wetland 3 (PSS_03) is hydrologically connected to RC, SRC_C, and REVCRK and is characterized by wetland associated vegetation such as arroyo willow, Northwest territory sedge, and Idaho bent with quaking aspen saplings. Photo taken facing west from UTM coordinates 313189.05 meters east and 4182012.41 meters north in the zone 11S.

Palustrine Emergent Wetlands (Cowardin Type PEM)



Photo 32. Palustrine Emergent Wetland 1 (PEM_01) within the OHWM of RC is characterized by wetland associated vegetation such as red-tinge bulrush. Photo taken facing south from UTM coordinates 313113.31 meters east and 4181961.19 meters north in the zone 11S.

Appendix E. Study Area Photographs



Photo 33. Palustrine Emergent Wetland 2 (PEM_02) is hydrologically connected to RC and is characterized by wetland associated vegetation such as wooly sedge. Photo taken facing east from UTM coordinates 313150.14 meters east and 4182122.76 meters north in the zone 11S.



Photo 34. Palustrine Emergent Wetland 3 (PEM_03) is hydrologically connected to REVCRK and is characterized by wetland associated vegetation such as red-tinge bulrush, woolly sedge, and field horsetail. Photo taken facing east from UTM coordinates 313211.10 meters east and 4182009.89 meters north in the zone 11S.

Appendix F.

Ordinary High Water Mark (OHWM) Delineation Datasheets

U.S. Army Corps of Engineers (USACE)

RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-CO-R.

OMB Control No. 0710-XXXX

Approval Expires:

Project ID #: ~~Rush Creek Powerhouse~~ Tailrace ⟷ Site Name: Rush Creek Enhancement Area | Date and Time: 10/5/23 4:30 pm

Location (lat/long): 4182040.88 mN, 313039.80 mE UTM 11S | Investigator(s): Robyn Smith, Emily Ferrell

Step 1 Site overview from remote and online resources

Check boxes for online resources used to evaluate site:

- [x] gage data
- [ ] LiDAR
- [ ] geologic maps
- [ ] climatic data
- [x] satellite imagery
- [x] land use maps
- [x] aerial photos
- [x] topographic maps
- [ ] Other: _____

Describe land use and flow conditions from online resources.

Were there any recent extreme events (floods or drought)?

Hydroelectric tailrace release channel

Step 2 Site conditions during field assessment

First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.

Man made tailrace from the Powerhouse

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below `b', at `x', or just above `a' the OHWM.

OHWM. Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:**
  - [x] *on the bank:*
  - [x] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: _____
- [x] **Shelving:**
  - [ ] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [x] *man-made berms or levees:*
  - [ ] *other berms:* _____
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [ ] **Instream bedforms and other bedload transport evidence:**
  - [ ] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [ ] *bedforms (e.g., poofs, riffles, steps, etc.):*
  - [ ] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [ ] **Secondary channels:**

Sediment indicators

- [ ] **Soil development:**
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [x] **Changes in particle-sized distribution:**
  - [x] *transition from* cobble/gravel *to* leaf litter
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:**

Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs).* ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

- [x] *vegetation absent to:* willows/aspen/equisetum
- [ ] *moss to:*
- [ ] *forbs to:*
- [ ] *graminoids to:*
- [ ] *woody shrubs to:*
- [ ] *deciduous trees to:*
- [ ] *coniferous trees to:*
- [ ] **Vegetation matted down and/or bent:**
- [x] **Exposed roots below intact soil layer:**

Ancillary indicators

- [ ] **Wracking/presence of organic litter:**
- [ ] **Presence of large wood:**
- [ ] **Leaf litter disturbed or washed away:**
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators?

Describe:

Step 4 Is additional information needed to support this determination?

- [ ] Yes
- [x] No

If yes, describe and attach information to datasheet:

Enhancement Area

Project ID #: ~~Tailrace~~

Step 5 Describe rationale for location of OHWM

Clear undercut bank under tree roots, gravel deposition lines, and unvegetated areas transitioning to willows and aspen.
Clear shelving in bank downstream of HWY 158 bridge.

Additional observations or notes

TR-001 - north
TR-002 - north
TR-003 - north
TR-004 - north
TR-005 - north
TR-006 - north
TR-007 - north
TR-008 - south to TR-013 south
TR-014 to TR-021 south bank east of HWY 158 bridge
TR-022 to TR-028 north bank to merge with Rush Creek

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? [X] Yes [ ] No If no, explain why not: _____

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description
9487	TR-028 water mark lines on trees from 2023 flooding
9486	TR-028 intersection of tailrace with Rush Creek from south shore
9485	TR-021 intersection of tailrace with Rush Creek from north shore
9482	tailrace downstream from bridge on HWY 158
9481	tailrace upstream from bridge on HWY 158
9480	TR-008 tailrace upstream from bridge in Powerhouse area
9479	TR-001 through aspen/willows to south shore of tailrace

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 1 **Site overview from remote and online resources** **Complete Step 1 prior to site visit.**

Online Resources: Identify what information is available for the site. Check boxes on datasheet next to the resources used to assess this site.

a. gage data
b. aerial photos
c. satellite imagery
d. LiDAR
e. topographic maps
f. geologic maps
g. land use maps
h. climatic data (precipitation and temperature)

Landscape context: Use the online resources to put the site in the context of the surrounding landscape.

a. **Note on the datasheet under Step 1:**
   i. Overall land use and change if known
   ii. Recent extreme events if known (e.g., flood, drought, landslides, debris flows, wildfires)
b. Consider the following to inform weighting of evidence observed during field visit.
   i. What physical characteristics are likely to be observed in specific environments?
   ii. Was there a recent flood or drought? Are you expecting to see recently formed or obscured indicators?
   iii. How will land use affect specific stream characteristics? How natural is the hydrologic regime? How stable has the landscape been over the last year, decade, century?

Step 2 Site conditions during the field assessment (assemble evidence)

a. Identify the assessment area.
b. Walk up and down the assessment area noting all the potential OHWM indicators.
c. Note broad trends in channel shape, vegetation, and sediment characteristics.
   i. Is this a single thread or multi-thread system? Is this a stream-wetland complex?
   ii. Are there any secondary and/or floodplain channels?
   iii. Are there obvious man-made alterations to the system?
   iv. Are there man-made (e.g., bridges, dams, culverts) or natural structures (e.g., bedrock outcrops, Large Wood jams) that will influence or control flow?
d. Look for signs of recurring fluvial action.
   i. Where does the flow converge on the landscape?
   ii. Are there signs of fluvial action (sediment sorting, bedforms, etc.) at the convergence zone?
e. Look for indicators on both banks. If the opposite bank is not accessible, then look across the channel at the bank.
f. **In Step 2 of the datasheet** describe any adjacent land use or flow conditions that may influence interpretation of each line of evidence.
   i. What land use and flow conditions may be affecting your ability to observe indicators at the site?
   ii. What recent extreme events may have caused changes to the site and affected your ability to observe indicators?

Step 3a List evidence

Assemble evidence by checking the boxes next to each line of evidence:

a. If needed, use a separate scratch datasheet to check boxes next to possible indicators, or check boxes of possible indicators in pencil and use pen for final decision.
b. If using fillable form, then follow the instructions for filling in the fillable form.

Context is important when assembling evidence. For instance, pool development may be an indicator of interest on the bed of a dry stream, but may not be a useful indicator to take note of in a flowing stream. On the other hand, if the pool is found in a secondary channel adjacent to the main channel, it could provide a line of evidence for a minimum elevation of high flows. Therefore, consider the site context when deciding which indicators provide evidence for identifying the OHWM. Explain reasoning in Step 5.

Questions to consider while making observations and listing evidence at a site:

Geomorphic indicators	**Sediment and soil indicators**	**Vegetation Indicators**	**Ancillary indicators**
Where are the breaks in slope?	Where does evidence of soil formation appear?	Where are the significant transitions in vegetation species, density, and age?	Is there organic litter present?
Are there identifiable banks?		Is there vegetation growing on the channel bed?	
Is there an easily identifiable top of bank?	Are there mudcracks present?	If no, how long does it take for the non-tolerant vegetation to establish relative to how often flows occur in the channel?	Is there any leaf litter disturbed or washed away?
Are the banks actively eroding?			
Are the banks undercut?	Is there evidence of sediment sorting by grain size?	Where are the significant transitions in vegetation?	Is there large wood deposition?
Are the banks armored?			
Is the channel confined by the surrounding hillslopes?		Is the vegetation tolerant of flowing water?	Is there evidence of water staining?
Are there natural or man-made berms and levees?		Has any vegetation been flattened by flowing water?	
Are there fluvial terraces?			
Are there channel bars?			

Are the following features of fluvial transport present?
Evidence of erosion: obstacle marks, scour, armoring
Bedforms; riffles, pools, steps, knickpoints/headcuts
Evidence of deposition: imbricated clasts, gravel sheets, etc.

In some cases, it may be helpful to explain why an indicator was NOT at the OHWM elevation, but found above or below. It can also be useful to note if specific indicators (e.g., vegetation) are NOT present. For instance, note if the site has no clear vegetation zonation.

Step 3b Weight each line of evidence and weigh body of evidence

Weight each indicator by considering its importance based upon:

***Landscape context from Step 1 can help determine the relevance, strength, and reliability of the indicators observed in the field.**

a. Relevance:

i. Is this indicator left by low, high, or extreme flows?

Tips on how to assess the indicator relative to type of flow:

Consider the elevation of the indicator relative to the channel bed. What is the current flow level based on season or nearby gages? Consider the elevation of the indicator relative to the current flow. If the stream is currently at baseflow and indicator is adjacent to that, then it is likely a low flow indicator. The difference between high and extreme flow indicators can sometimes be difficult to determine.

***Information in Chapter 2 of the OHWM field manual provides information on specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.**

ii. Did recent extreme events and/or land use affect this indicator?

1. Recent floods may have left many extreme flow indicators, or temporarily altered channel form. Other resources will likely be needed to support any OHWM identification at this site. Field evidence of the OHWM may have to wait for the site to recover from the recent flood.
2. Droughts may cause field evidence of OHWM to be obscured, because there has been an extended time since the last high flow event. There can be overgrowth of vegetation or deposition of material from surrounding landscape that can obscure indicators.
3. Both man-made (e.g., dams, construction, mining activities, urbanization, agriculture, grazing) and natural (e.g., fires, floods, debris flows, beaver dams) disturbances can all alter how indicators are expected to appear at a site. Chapter 6 and Chapter 7 of the OHWM field manual provides specific case-studies that can help in interpreting evidence at these sites.

b. Strength:

i. Is this indicator persistent across the landscape?

1. Look up and downstream and across the channel to see if you see the same indicator at multiple locations.
2. Does the indicator occur at the same elevation as other indicators?

c. Reliability:

i. Is this indicator persistent on the landscape over time? Will this indicator still persist across seasons?

1. This can be difficult to determine for some indicators and may be specific to climatic region (in terms of persistence of vegetation) and history of land use or other natural disturbances.
2. Chapter 2, Chapter 6, and Chapter 7 of the OHWM field manual describes each indicator in detail and provides examples of areas where indicators are difficult to interpret.

d. Weigh body of evidence:

i. Combine weights: integrate the weighted line of evidence (relevance, strength, reliability) of each indicator.

ii. For each of the observed indicators, which are more heavily weighted? Where do high value indicators co-occur along the stream reach? Do they co-occur at a similar elevation along the banks relative to water surface (or channel bed if there is no water).

iii. On datasheet, select the indicators used to identify the OHWM. Information in Chapter 2 of the OHWM field manual provides descriptions of specific indicators which can assist in putting these in context and determining relevance, strength, and relieability.

e. Take photographs of indicators and attach a log using either page 2 of datasheet or another method of logging photos.

i. Annotate photos with descriptions of indicators.

Step 4 Is additional information needed? Are other resources needed to support the lines of evidence observed in the field?

a. If additional resources are needed, then repeat steps 3a and 3b for the resources selected in Step 1 of assembling, weighting, and weighing evidence collected from online resources. Chapter 5 of the OHWM field manual provides information on using online resources.

b. Any data collected from online tools have strengths and weaknesses. Make sure these are clear when determining relevance, strength, and reliability of the remotely collected data. Clearly describe why other resources were needed to support the lines of evidence observed in the field, as well as the relevance, strength, and reliability of the supporting data and/or resources.

c. Attach any remote data and data analysis to the datasheet.

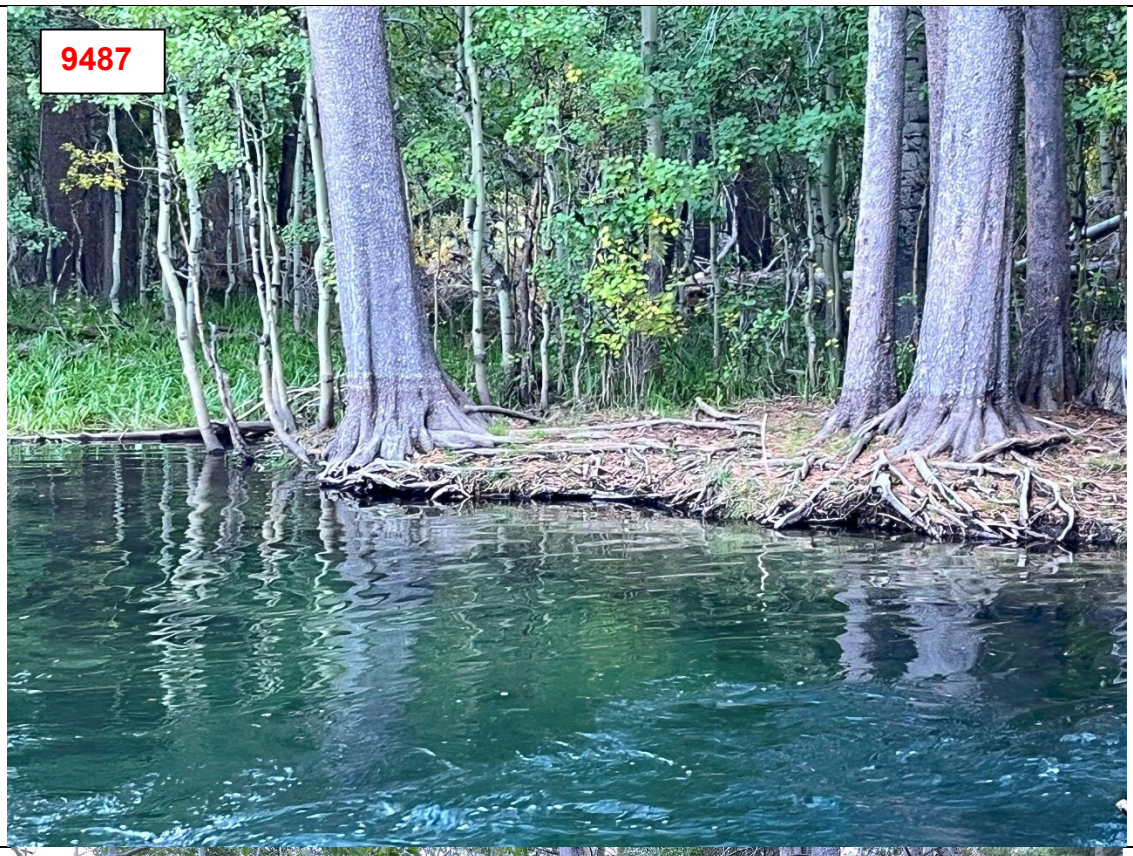
Step 5 Describe rationale for location of OHWM:

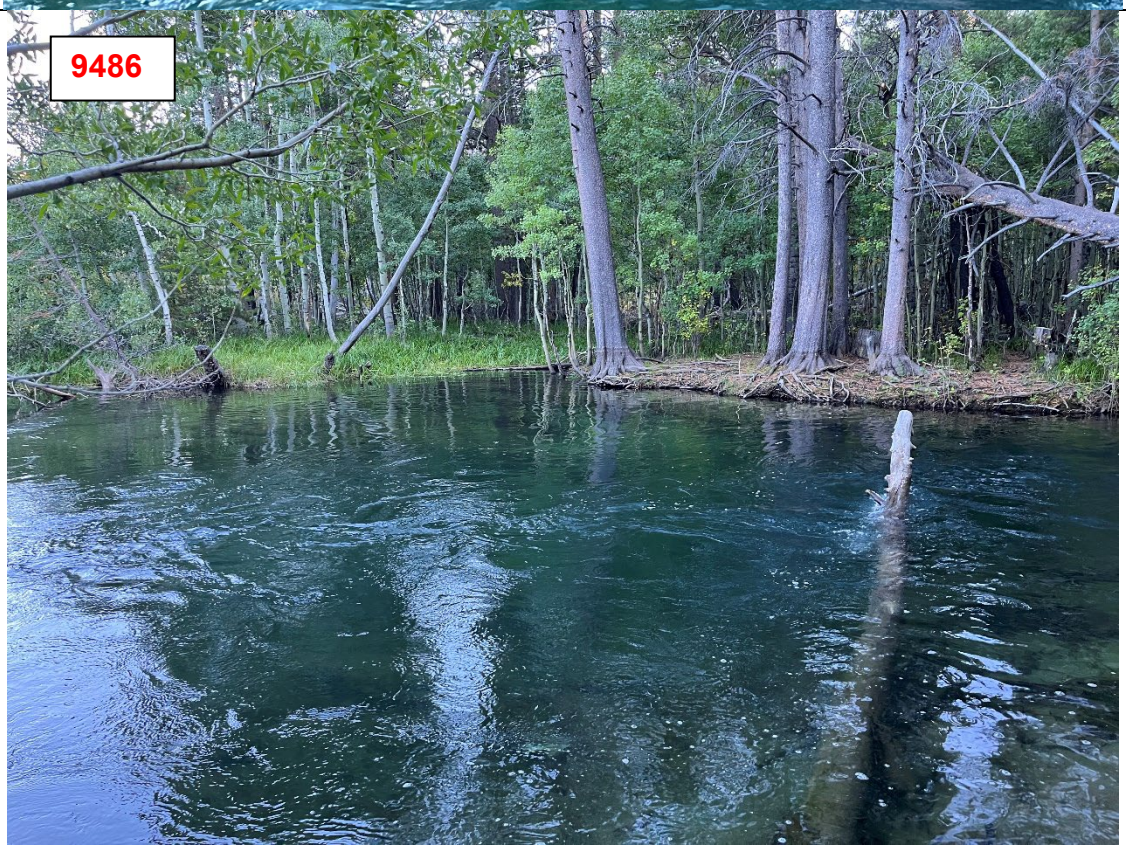
a. Why do the combination of indicators represent the OHWM?

b. If there are multiple possibilites for the OHWM, explain why there are two (or more) possibilities. Include any relevant discussion on why specific indicators were not included in the final decision.

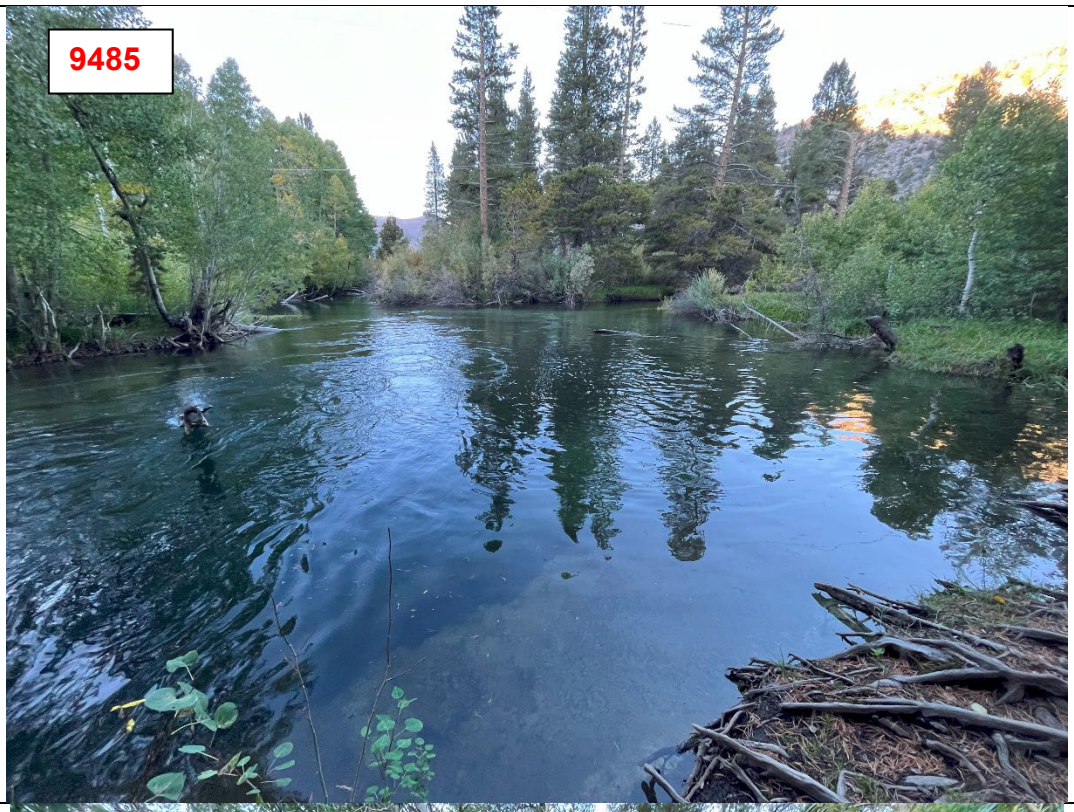
c. If needed, add additional site notes on page 2 of the datasheet under Step 5.

Tailrace (TR) Photographs





Tailrace (TR) Photographs





Tailrace (TR) Photographs





Tailrace (TR) Photographs



→ In the Powerhouse complex

U.S. Army Corps of Engineers (USACE)

RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-CO-R.

OMB Control No. 0710-XXXX
Approval Expires:

Project ID #: Rush Creek ↔ Site Name: Rush Creek Enhancement Area Date and Time: 10/4/23 8:30 am

Location (lat/long): 4181940.05mN, 313066.93mE UTM 11S Investigator(s): Robyn Smith & Emily Ferrell

Step 1 Site overview from remote and online resources
Check boxes for online resources used to evaluate site:

- [ ] gage data
- [ ] LiDAR
- [x] geologic maps
- [ ] climatic data
- [x] satellite imagery
- [x] land use maps
- [x] aerial photos
- [x] topographic maps
- [ ] Other: _____

Describe land use and flow conditions from online resources.
Were there any recent extreme events (floods or drought)?

Hydroelectric facilities - flow altered

2022/23 abnormal water year

Step 2 Site conditions during field assessment

First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.

Rock slope protection near culverts, road and bridge go over Rush Creek in Powerhouse area.

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below `b', at `x', or just above `a' the OHWM.

OHWM. Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:**
  - [x] *on the bank:*
  - [x] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: _____
- [x] **Shelving:**
  - [ ] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [x] *man-made berms or levees:*
  - [ ] *other berms:* _____
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [x] **Instream bedforms and other bedload transport evidence:**
  - [ ] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [ ] *bedforms (e.g., poofs, riffles, steps, etc.):*
  - [x] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [ ] **Secondary channels:**

Sediment indicators

- [ ] **Soil development:**
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [x] **Changes in particle-sized distribution:**
  - [x] *transition from* cobble/sand *to* organic litter
  - [x] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:**

Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs).* ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

- [x] *vegetation absent to:* horsetails/moss
- [ ] *moss to:*
- [ ] *forbs to:*
- [ ] *graminoids to:*
- [x] *woody shrubs to:* conifer trees
- [ ] *deciduous trees to:*
- [ ] *coniferous trees to:*
- [ ] **Vegetation matted down and/or bent:**
- [x] **Exposed roots below intact soil layer:**

Ancillary indicators

- [x] **Wracking/presence of organic litter:**
- [ ] **Presence of large wood:**
- [x] **Leaf litter disturbed or washed away:**
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators?

Describe:

Willows (Salix spp.), Rosa woodsii, dogwood, riparian, horsetail

transitioning to upland conifers like white fir

Step 4 Is additional information needed to support this determination?

- [ ] Yes
- [x] No

If yes, describe and attach information to datasheet:

Enhancement Area

Project ID #: ~~Rush Creek~~

Step 5 Describe rationale for location of OHWM

Some OHWM indicators are tricky because of abnormal flooding this year. Sediment deposition is tricky but changes in slope and water staining marks on bedrock are still reliable.
Woody vegetation transition is also reliable, older willows and shrubs indicate conditions in previous years.

Additional observations or notes

RC OHWM 1 - man made rock slope protection (S)
RC OHWM 2 - man made rock slope protection (S)
RC OHWM 3 - edge of rock slope protection (S)
RC OHWM 4 - near water stained bedrock (S)
RC OHWM 5 - willow root slope break (S)
RC OHWM 6 - edge of man made rock slope (N)
RC OHWM 7 - change in slope
RC OHWM 8 - white fir transition
RC OHWM 9 - white fir → sediment dep.
RC OHWM 10 - edge of man made berm (N)
RC OHWM 11 - berm
RC OHWM 12 - sediment line
RC OHWM 13 - sediment line
RC OHWM 14 - bank edge of horsetails
RC OHWM 15 - bank roots, sediment dep.
RC OHWM 16 - sediment dep.
RC OHWM 17 - berm line
RC OHWM 18 - break in slope - cobble
RC OHWM 19 - break in slope
RC OHWM 20 - break in slope
RC OHWM 21 - vegetation transition
RC OHWM 22 - litter line / rock transition
RC OHWM 23 - exposed tree roots
RC OHWM 24 - willow riparian area
RC OHWM 25 - cobble line - veg trans.
RC OHWM 26 - man made berm

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? [X] Yes [ ] No If no, explain why not: _____

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description
9420	Rush Creek upstream of bridge in Powerhouse area
9424	Rush Creek upstream of bridge OHWM on north shore
9425	Rush Creek near road looking to north shore
9426	Rush Creek near road looking to south shore
9427	Rush Creek downstream of bridge in Powerhouse area

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 1 **Site overview from remote and online resources** **Complete Step 1 prior to site visit.**

Online Resources: Identify what information is available for the site. Check boxes on datasheet next to the resources used to assess this site.

a. gage data
b. aerial photos
c. satellite imagery
d. LiDAR
e. topographic maps
f. geologic maps
g. land use maps
h. climatic data (precipitation and temperature)

Landscape context: Use the online resources to put the site in the context of the surrounding landscape.

a. **Note on the datasheet under Step 1:**
   i. Overall land use and change if known
   ii. Recent extreme events if known (e.g., flood, drought, landslides, debris flows, wildfires)
b. Consider the following to inform weighting of evidence observed during field visit.
   i. What physical characteristics are likely to be observed in specific environments?
   ii. Was there a recent flood or drought? Are you expecting to see recently formed or obscured indicators?
   iii. How will land use affect specific stream characteristics? How natural is the hydrologic regime? How stable has the landscape been over the last year, decade, century?

Step 2 Site conditions during the field assessment (assemble evidence)

a. Identify the assessment area.
b. Walk up and down the assessment area noting all the potential OHWM indicators.
c. Note broad trends in channel shape, vegetation, and sediment characteristics.
   i. Is this a single thread or multi-thread system? Is this a stream-wetland complex?
   ii. Are there any secondary and/or floodplain channels?
   iii. Are there obvious man-made alterations to the system?
   iv. Are there man-made (e.g., bridges, dams, culverts) or natural structures (e.g., bedrock outcrops, Large Wood jams) that will influence or control flow?
d. Look for signs of recurring fluvial action.
   i. Where does the flow converge on the landscape?
   ii. Are there signs of fluvial action (sediment sorting, bedforms, etc.) at the convergence zone?
e. Look for indicators on both banks. If the opposite bank is not accessible, then look across the channel at the bank.
f. **In Step 2 of the datasheet** describe any adjacent land use or flow conditions that may influence interpretation of each line of evidence.
   i. What land use and flow conditions may be affecting your ability to observe indicators at the site?
   ii. What recent extreme events may have caused changes to the site and affected your ability to observe indicators?

Step 3a List evidence

Assemble evidence by checking the boxes next to each line of evidence:

a. If needed, use a separate scratch datasheet to check boxes next to possible indicators, or check boxes of possible indicators in pencil and use pen for final decision.
b. If using fillable form, then follow the instructions for filling in the fillable form.

Context is important when assembling evidence. For instance, pool development may be an indicator of interest on the bed of a dry stream, but may not be a useful indicator to take note of in a flowing stream. On the other hand, if the pool is found in a secondary channel adjacent to the main channel, it could provide a line of evidence for a minimum elevation of high flows. Therefore, consider the site context when deciding which indicators provide evidence for identifying the OHWM. Explain reasoning in Step 5.

Questions to consider while making observations and listing evidence at a site:

Geomorphic indicators	**Sediment and soil indicators**	**Vegetation Indicators**	**Ancillary indicators**
Where are the breaks in slope?	Where does evidence of soil formation appear?	Where are the significant transitions in vegetation species, density, and age?	Is there organic litter present?
Are there identifiable banks?			
Is there an easily identifiable top of bank?	Are there mudcracks present?	Is there vegetation growing on the channel bed?	Is there any leaf litter disturbed or washed away?
Are the banks actively eroding?		If no, how long does it take for the non-tolerant vegetation to establish relative to how often flows occur in the channel?	
Are the banks undercut?	Is there evidence of sediment sorting by grain size?		
Are the banks armored?		Where are the significant transitions in vegetation?	Is there large wood deposition?
Is the channel confined by the surrounding hillslopes?			
Are there natural or man-made berms and levees?		Is the vegetation tolerant of flowing water?	Is there evidence of water staining?
Are there fluvial terraces?		Has any vegetation been flattened by flowing water?	
Are there channel bars?			

Are the following features of fluvial transport present?
Evidence of erosion: obstacle marks, scour, armoring
Bedforms; riffles, pools, steps, knickpoints/headcuts
Evidence of deposition: imbricated clasts, gravel sheets, etc.

In some cases, it may be helpful to explain why an indicator was NOT at the OHWM elevation, but found above or below. It can also be useful to note if specific indicators (e.g., vegetation) are NOT present. For instance, note if the site has no clear vegetation zonation.

Step 3b Weight each line of evidence and weigh body of evidence

Weight each indicator by considering its importance based upon:

***Landscape context from Step 1 can help determine the relevance, strength, and reliability of the indicators observed in the field.**

a. Relevance:

i. Is this indicator left by low, high, or extreme flows?

Tips on how to assess the indicator relative to type of flow:

Consider the elevation of the indicator relative to the channel bed. What is the current flow level based on season or nearby gages? Consider the elevation of the indicator relative to the current flow. If the stream is currently at baseflow and indicator is adjacent to that, then it is likely a low flow indicator. The difference between high and extreme flow indicators can sometimes be difficult to determine.

***Information in Chapter 2 of the OHWM field manual provides information on specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.**

ii. Did recent extreme events and/or land use affect this indicator?

1. Recent floods may have left many extreme flow indicators, or temporarily altered channel form. Other resources will likely be needed to support any OHWM identification at this site. Field evidence of the OHWM may have to wait for the site to recover from the recent flood.
2. Droughts may cause field evidence of OHWM to be obscured, because there has been an extended time since the last high flow event. There can be overgrowth of vegetation or deposition of material from surrounding landscape that can obscure indicators.
3. Both man-made (e.g., dams, construction, mining activities, urbanization, agriculture, grazing) and natural (e.g., fires, floods, debris flows, beaver dams) disturbances can all alter how indicators are expected to appear at a site. Chapter 6 and Chapter 7 of the OHWM field manual provides specific case-studies that can help in interpreting evidence at these sites.

b. Strength:

i. Is this indicator persistent across the landscape?

1. Look up and downstream and across the channel to see if you see the same indicator at multiple locations.
2. Does the indicator occur at the same elevation as other indicators?

c. Reliability:

i. Is this indicator persistent on the landscape over time? Will this indicator still persist across seasons?

1. This can be difficult to determine for some indicators and may be specific to climatic region (in terms of persistence of vegetation) and history of land use or other natural disturbances.
2. Chapter 2, Chapter 6, and Chapter 7 of the OHWM field manual describes each indicator in detail and provides examples of areas where indicators are difficult to interpret.

d. Weigh body of evidence:

i. Combine weights: integrate the weighted line of evidence (relevance, strength, reliability) of each indicator.

ii. For each of the observed indicators, which are more heavily weighted? Where do high value indicators co-occur along the stream reach? Do they co-occur at a similar elevation along the banks relative to water surface (or channel bed if there is no water).

iii. On datasheet, select the indicators used to identify the OHWM. Information in Chapter 2 of the OHWM field manual provides descriptions of specific indicators which can assist in putting these in context and determining relevance, strength, and relieability.

e. Take photographs of indicators and attach a log using either page 2 of datasheet or another method of logging photos.

i. Annotate photos with descriptions of indicators.

Step 4 Is additional information needed? Are other resources needed to support the lines of evidence observed in the field?

a. If additional resources are needed, then repeat steps 3a and 3b for the resources selected in Step 1 of assembling, weighting, and weighing evidence collected from online resources. Chapter 5 of the OHWM field manual provides information on using online resources.

b. Any data collected from online tools have strengths and weaknesses. Make sure these are clear when determining relevance, strength, and reliability of the remotely collected data. Clearly describe why other resources were needed to support the lines of evidence observed in the field, as well as the relevance, strength, and reliability of the supporting data and/or resources.

c. Attach any remote data and data analysis to the datasheet.

Step 5 Describe rationale for location of OHWM:

a. Why do the combination of indicators represent the OHWM?

b. If there are multiple possibilites for the OHWM, explain why there are two (or more) possibilities. Include any relevant discussion on why specific indicators were not included in the final decision.

c. If needed, add additional site notes on page 2 of the datasheet under Step 5.

Rush Creek above Silver Lake (RC) in the Powerhouse Complex Photographs





Rush Creek above Silver Lake (RC) in the Powerhouse Complex Photographs





Rush Creek above Silver Lake (RC) in the Powerhouse Complex Photographs



U.S. Army Corps of Engineers (USACE)

RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-CO-R.

OMB Control No. 0710-XXXX
Approval Expires:

Project ID #: Enhancement Area | Site Name: Rush Creek in Northern EA | Date and Time: 10/6/23 9:00 am - 5:00 pm

Location (lat/long): 37.767338, -119.122164 | Investigator(s): Robyn Smith + Emily Ferrell

Step 1 Site overview from remote and online resources
Check boxes for online resources used to evaluate site:

- [ ] gage data
- [ ] LiDAR
- [ ] geologic maps
- [ ] climatic data
- [x] satellite imagery
- [x] land use maps
- [x] aerial photos
- [x] topographic maps
- [ ] Other: _____

Describe land use and flow conditions from online resources.
Were there any recent extreme events (floods or drought)?
Winter of 2022-2023 was a record high water year. It was clear Rush Creek overtopped the banks.

Step 2 Site conditions during field assessment

First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.

The clear shelving along the channel is the best indicator. Releases from the Rush Creek Powerhouse Tailrace likely affect OHWM line in this area.

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below `b', at `x', or just above `a' the OHWM.

OHWM. Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:** very vertical drop, adjacent to wetland terraces
  - [x] *on the bank:*
  - [x] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: _____
- [x] **Shelving:**
  - [x] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* _____
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [ ] **Instream bedforms and other bedload transport evidence:**
  - [ ] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [ ] *bedforms (e.g., poofs, riffles, steps, etc.):*
  - [ ] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [x] **Secondary channels:** → Observed near SRC + Reversed Creek confluence within wetlands. Could be product of high water year.

Sediment indicators

- [ ] **Soil development:**
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [ ] **Changes in particle-sized distribution:**
  - [ ] *transition from* _____ to _____
  - [ ] *upper limit of sand-sized particles*
  - [x] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:**

Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs).* ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

- [x] *vegetation absent to:* Scirpus microcarpus and willows
- [ ] *moss to:*
- [ ] *forbs to:*
- [ ] *graminoids to:*
- [x] *woody shrubs to:* Lodgepole pine
- [ ] *deciduous trees to:*
- [ ] *coniferous trees to:*
- [ ] **Vegetation matted down and/or bent:**
- [x] **Exposed roots below intact soil layer:** some undercut banks

Ancillary indicators

- [ ] **Wracking/presence of organic litter:**
- [x] **Presence of large wood:**
- [x] **Leaf litter disturbed or washed away:**
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators?

Describe:
Ancillary indicators were not used because it was clear Rush Creek had overtopped banks in such a high water year.

Step 4 Is additional information needed to support this determination?

- [ ] Yes
- [x] No

If yes, describe and attach information to datasheet:

Project ID #: Rush Creek Enhancement Area

Step 5 Describe rationale for location of OHWM

The primary transition is from the active unvegetated stream channel to a well-defined vegetated bank, in most places a consistent shelf was observed.

Additional observations or notes

Both the Rush Creek Powerhouse Tailrace and Reversed Creek flow into Rush Creek above Silver Lake, creating a complex floodplain with adjoining forested, scrub-shrub, and emergent wetlands.

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? [X] Yes [ ] No If no, explain why not: _____

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description
9535	Near the junction with the tailrace, obvious vegetation break
9534	On bank looking towards tailrace channel
9532	Near the confluence with Reversed Creek
9529	Near a forested wetland dominated by willows
9528	Looking north from willow area on the eastern bank
9526	Looking north from the northern edge of the enhancement area on the eastern bank. The OHWM widens at this location because the tailrace merges with Rush Creek just upstream.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 1 **Site overview from remote and online resources** **Complete Step 1 prior to site visit.**

Online Resources: Identify what information is available for the site. Check boxes on datasheet next to the resources used to assess this site.

a. gage data
b. aerial photos
c. satellite imagery
d. LiDAR
e. topographic maps
f. geologic maps
g. land use maps
h. climatic data (precipitation and temperature)

Landscape context: Use the online resources to put the site in the context of the surrounding landscape.

a. **Note on the datasheet under Step 1:**
   i. Overall land use and change if known
   ii. Recent extreme events if known (e.g., flood, drought, landslides, debris flows, wildfires)
b. Consider the following to inform weighting of evidence observed during field visit.
   i. What physical characteristics are likely to be observed in specific environments?
   ii. Was there a recent flood or drought? Are you expecting to see recently formed or obscured indicators?
   iii. How will land use affect specific stream characteristics? How natural is the hydrologic regime? How stable has the landscape been over the last year, decade, century?

Step 2 Site conditions during the field assessment (assemble evidence)

a. Identify the assessment area.
b. Walk up and down the assessment area noting all the potential OHWM indicators.
c. Note broad trends in channel shape, vegetation, and sediment characteristics.
   i. Is this a single thread or multi-thread system? Is this a stream-wetland complex?
   ii. Are there any secondary and/or floodplain channels?
   iii. Are there obvious man-made alterations to the system?
   iv. Are there man-made (e.g., bridges, dams, culverts) or natural structures (e.g., bedrock outcrops, Large Wood jams) that will influence or control flow?
d. Look for signs of recurring fluvial action.
   i. Where does the flow converge on the landscape?
   ii. Are there signs of fluvial action (sediment sorting, bedforms, etc.) at the convergence zone?
e. Look for indicators on both banks. If the opposite bank is not accessible, then look across the channel at the bank.
f. **In Step 2 of the datasheet** describe any adjacent land use or flow conditions that may influence interpretation of each line of evidence.
   i. What land use and flow conditions may be affecting your ability to observe indicators at the site?
   ii. What recent extreme events may have caused changes to the site and affected your ability to observe indicators?

Step 3a List evidence

Assemble evidence by checking the boxes next to each line of evidence:

a. If needed, use a separate scratch datasheet to check boxes next to possible indicators, or check boxes of possible indicators in pencil and use pen for final decision.
b. If using fillable form, then follow the instructions for filling in the fillable form.

Context is important when assembling evidence. For instance, pool development may be an indicator of interest on the bed of a dry stream, but may not be a useful indicator to take note of in a flowing stream. On the other hand, if the pool is found in a secondary channel adjacent to the main channel, it could provide a line of evidence for a minimum elevation of high flows. Therefore, consider the site context when deciding which indicators provide evidence for identifying the OHWM. Explain reasoning in Step 5.

Questions to consider while making observations and listing evidence at a site:

Geomorphic indicators	**Sediment and soil indicators**	**Vegetation Indicators**	**Ancillary indicators**
Where are the breaks in slope?	Where does evidence of soil formation appear?	Where are the significant transitions in vegetation species, density, and age?	Is there organic litter present?
Are there identifiable banks?		Is there vegetation growing on the channel bed?	
Is there an easily identifiable top of bank?	Are there mudcracks present?	If no, how long does it take for the non-tolerant vegetation to establish relative to how often flows occur in the channel?	Is there any leaf litter disturbed or washed away?
Are the banks actively eroding?			
Are the banks undercut?	Is there evidence of sediment sorting by grain size?	Where are the significant transitions in vegetation?	Is there large wood deposition?
Are the banks armored?			
Is the channel confined by the surrounding hillslopes?		Is the vegetation tolerant of flowing water?	Is there evidence of water staining?
Are there natural or man-made berms and levees?		Has any vegetation been flattened by flowing water?	
Are there fluvial terraces?			
Are there channel bars?			

Are the following features of fluvial transport present?
Evidence of erosion: obstacle marks, scour, armoring
Bedforms; riffles, pools, steps, knickpoints/headcuts
Evidence of deposition: imbricated clasts, gravel sheets, etc.

In some cases, it may be helpful to explain why an indicator was NOT at the OHWM elevation, but found above or below. It can also be useful to note if specific indicators (e.g., vegetation) are NOT present. For instance, note if the site has no clear vegetation zonation.

Step 3b Weight each line of evidence and weigh body of evidence

Weight each indicator by considering its importance based upon:

a. Relevance:

i. Is this indicator left by low, high, or extreme flows?

Tips on how to assess the indicator relative to type of flow:

Consider the elevation of the indicator relative to the channel bed. What is the current flow level based on season or nearby gages? Consider the elevation of the indicator relative to the current flow. If the stream is currently at baseflow and indicator is adjacent to that, then it is likely a low flow indicator. The difference between high and extreme flow indicators can sometimes be difficult to determine.

***Landscape context from Step 1 can help determine the relevance, strength, and reliability of the indicators observed in the field.**

***Information in Chapter 2 of the OHWM field manual provides information on specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.**

ii. Did recent extreme events and/or land use affect this indicator?

1. Recent floods may have left many extreme flow indicators, or temporarily altered channel form. Other resources will likely be needed to support any OHWM identification at this site. Field evidence of the OHWM may have to wait for the site to recover from the recent flood.
2. Droughts may cause field evidence of OHWM to be obscured, because there has been an extended time since the last high flow event. There can be overgrowth of vegetation or deposition of material from surrounding landscape that can obscure indicators.
3. Both man-made (e.g., dams, construction, mining activities, urbanization, agriculture, grazing) and natural (e.g., fires, floods, debris flows, beaver dams) disturbances can all alter how indicators are expected to appear at a site. Chapter 6 and Chapter 7 of the OHWM field manual provides specific case-studies that can help in interpreting evidence at these sites.

b. Strength:

i. Is this indicator persistent across the landscape?

1. Look up and downstream and across the channel to see if you see the same indicator at multiple locations.
2. Does the indicator occur at the same elevation as other indicators?

c. Reliability:

i. Is this indicator persistent on the landscape over time? Will this indicator still persist across seasons?

1. This can be difficult to determine for some indicators and may be specific to climatic region (in terms of persistence of vegetation) and history of land use or other natural disturbances.
2. Chapter 2, Chapter 6, and Chapter 7 of the OHWM field manual describes each indicator in detail and provides examples of areas where indicators are difficult to interpret.

d. Weigh body of evidence:

i. Combine weights: integrate the weighted line of evidence (relevance, strength, reliability) of each indicator.

ii. For each of the observed indicators, which are more heavily weighted? Where do high value indicators co-occur along the stream reach? Do they co-occur at a similar elevation along the banks relative to water surface (or channel bed if there is no water).

iii. On datasheet, select the indicators used to identify the OHWM. Information in Chapter 2 of the OHWM field manual provides descriptions of specific indicators which can assist in putting these in context and determining relevance, strength, and relieability.

e. Take photographs of indicators and attach a log using either page 2 of datasheet or another method of logging photos.

i. Annotate photos with descriptions of indicators.

Step 4 Is additional information needed? Are other resources needed to support the lines of evidence observed in the field?

a. If additional resources are needed, then repeat steps 3a and 3b for the resources selected in Step 1 of assembling, weighting, and weighing evidence collected from online resources. Chapter 5 of the OHWM field manual provides information on using online resources.

b. Any data collected from online tools have strengths and weaknesses. Make sure these are clear when determining relevance, strength, and reliability of the remotely collected data. Clearly describe why other resources were needed to support the lines of evidence observed in the field, as well as the relevance, strength, and reliability of the supporting data and/or resources.

c. Attach any remote data and data analysis to the datasheet.

Step 5 Describe rationale for location of OHWM:

a. Why do the combination of indicators represent the OHWM?

b. If there are multiple possibilites for the OHWM, explain why there are two (or more) possibilities. Include any relevant discussion on why specific indicators were not included in the final decision.

c. If needed, add additional site notes on page 2 of the datasheet under Step 5.

Rush Creek above Silver Lake (RC) at North End of Study Area Photographs





Rush Creek above Silver Lake (RC) at North End of Study Area Photographs





Rush Creek above Silver Lake (RC) at North End of Study Area Photographs





U.S. Army Corps of Engineers (USACE)

RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-CO-R.

OMB Control No. 0710-XXXX

Approval Expires:

Project ID #: Enhancement Area | Site Name: Reversed Creek | Date and Time: 10/7/23 1:45pm

Location (lat/long): 37.766396, -119.120638 | Investigator(s): Robyn Smith + Emily Ferrell

Step 1 Site overview from remote and online resources

Check boxes for online resources used to evaluate site:

- [ ] gage data
- [ ] LiDAR
- [ ] geologic maps
- [ ] climatic data
- [x] satellite imagery
- [x] land use maps
- [x] aerial photos
- [x] topographic maps
- [ ] Other: _____

Describe land use and flow conditions from online resources.

Were there any recent extreme events (floods or drought)?

Winter of 2022/2023 was a very high water year (record). Surrounding land use is rural residential.

Step 2 Site conditions during field assessment

First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.

A noticeable transition from unvegetated stream ~~bank~~ channel to heavily vegetated banks was observed.

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below `b', at `x', or just above `a' the OHWM.

OHWM. Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:**
  - [ ] *on the bank:*
  - [x] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: _____
- [x] **Shelving:**
  - [x] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* _____
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [ ] **Instream bedforms and other bedload transport evidence:**
  - [ ] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [ ] *bedforms (e.g., poofs, riffles, steps, etc.):*
  - [ ] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [ ] **Secondary channels:**

Sediment indicators

- [ ] **Soil development:**
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [ ] **Changes in particle-sized distribution:**
  - [ ] *transition from* _____ to _____
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:**

Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs).* ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

- [x] *vegetation absent to:* dense growth of herbs/graminoids
- [ ] *moss to:* and willows
- [ ] *forbs to:*
- [ ] *graminoids to:*
- [ ] *woody shrubs to:*
- [ ] *deciduous trees to:*
- [ ] *coniferous trees to:*
- [ ] **Vegetation matted down and/or bent:**
- [x] **Exposed roots below intact soil layer:**

Ancillary indicators

- [ ] **Wracking/presence of organic litter:**
- [ ] **Presence of large wood:**
- [ ] **Leaf litter disturbed or washed away:**
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators?

Describe:

Step 4 Is additional information needed to support this determination?

- [ ] Yes
- [x] No

If yes, describe and attach information to datasheet:

Project ID #: Enhancement Area

Step 5 Describe rationale for location of OHWM

Reversed Creek contains a steep bank, and transitions abruptly from an unvegetated channel to dense growth of graminoids/ willows. Underneath large trees on bank, the undercut roots are visible.

Additional observations or notes

Reversed Creek is adjacent to one palustrine emergent wetland and two scrub shrub wetlands. South Rush Creek flows into Reversed Creek and then Reversed Creek flows into Rush Creek above Silver Lake.

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? [X] Yes [ ] No If no, explain why not: _____

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description
9559	showing Reversed Creek from near the intersection of South Rush Creek looking east
9569	Looking north to the intersection with Rush Creek

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 1 **Site overview from remote and online resources** **Complete Step 1 prior to site visit.**

Online Resources: Identify what information is available for the site. Check boxes on datasheet next to the resources used to assess this site.

a. gage data
b. aerial photos
c. satellite imagery
d. LiDAR
e. topographic maps
f. geologic maps
g. land use maps
h. climatic data (precipitation and temperature)

Landscape context: Use the online resources to put the site in the context of the surrounding landscape.

a. **Note on the datasheet under Step 1:**
   i. Overall land use and change if known
   ii. Recent extreme events if known (e.g., flood, drought, landslides, debris flows, wildfires)
b. Consider the following to inform weighting of evidence observed during field visit.
   i. What physical characteristics are likely to be observed in specific environments?
   ii. Was there a recent flood or drought? Are you expecting to see recently formed or obscured indicators?
   iii. How will land use affect specific stream characteristics? How natural is the hydrologic regime? How stable has the landscape been over the last year, decade, century?

Step 2 Site conditions during the field assessment (assemble evidence)

a. Identify the assessment area.
b. Walk up and down the assessment area noting all the potential OHWM indicators.
c. Note broad trends in channel shape, vegetation, and sediment characteristics.
   i. Is this a single thread or multi-thread system? Is this a stream-wetland complex?
   ii. Are there any secondary and/or floodplain channels?
   iii. Are there obvious man-made alterations to the system?
   iv. Are there man-made (e.g., bridges, dams, culverts) or natural structures (e.g., bedrock outcrops, Large Wood jams) that will influence or control flow?
d. Look for signs of recurring fluvial action.
   i. Where does the flow converge on the landscape?
   ii. Are there signs of fluvial action (sediment sorting, bedforms, etc.) at the convergence zone?
e. Look for indicators on both banks. If the opposite bank is not accessible, then look across the channel at the bank.
f. **In Step 2 of the datasheet** describe any adjacent land use or flow conditions that may influence interpretation of each line of evidence.
   i. What land use and flow conditions may be affecting your ability to observe indicators at the site?
   ii. What recent extreme events may have caused changes to the site and affected your ability to observe indicators?

Step 3a List evidence

Assemble evidence by checking the boxes next to each line of evidence:

a. If needed, use a separate scratch datasheet to check boxes next to possible indicators, or check boxes of possible indicators in pencil and use pen for final decision.
b. If using fillable form, then follow the instructions for filling in the fillable form.

Context is important when assembling evidence. For instance, pool development may be an indicator of interest on the bed of a dry stream, but may not be a useful indicator to take note of in a flowing stream. On the other hand, if the pool is found in a secondary channel adjacent to the main channel, it could provide a line of evidence for a minimum elevation of high flows. Therefore, consider the site context when deciding which indicators provide evidence for identifying the OHWM. Explain reasoning in Step 5.

Questions to consider while making observations and listing evidence at a site:

Geomorphic indicators	**Sediment and soil indicators**	**Vegetation Indicators**	**Ancillary indicators**
Where are the breaks in slope?	Where does evidence of soil formation appear?	Where are the significant transitions in vegetation species, density, and age?	Is there organic litter present?
Are there identifiable banks?		Is there vegetation growing on the channel bed?	
Is there an easily identifiable top of bank?	Are there mudcracks present?	If no, how long does it take for the non-tolerant vegetation to establish relative to how often flows occur in the channel?	Is there any leaf litter disturbed or washed away?
Are the banks actively eroding?			
Are the banks undercut?	Is there evidence of sediment sorting by grain size?	Where are the significant transitions in vegetation?	Is there large wood deposition?
Are the banks armored?			
Is the channel confined by the surrounding hillslopes?		Is the vegetation tolerant of flowing water?	Is there evidence of water staining?
Are there natural or man-made berms and levees?		Has any vegetation been flattened by flowing water?	
Are there fluvial terraces?			
Are there channel bars?			

Are the following features of fluvial transport present?
Evidence of erosion: obstacle marks, scour, armoring
Bedforms; riffles, pools, steps, knickpoints/headcuts
Evidence of deposition: imbricated clasts, gravel sheets, etc.

In some cases, it may be helpful to explain why an indicator was NOT at the OHWM elevation, but found above or below. It can also be useful to note if specific indicators (e.g., vegetation) are NOT present. For instance, note if the site has no clear vegetation zonation.

Step 3b Weight each line of evidence and weigh body of evidence

Weight each indicator by considering its importance based upon:

a. Relevance:

i. Is this indicator left by low, high, or extreme flows?

Tips on how to assess the indicator relative to type of flow:

Consider the elevation of the indicator relative to the channel bed. What is the current flow level based on season or nearby gages? Consider the elevation of the indicator relative to the current flow. If the stream is currently at baseflow and indicator is adjacent to that, then it is likely a low flow indicator. The difference between high and extreme flow indicators can sometimes be difficult to determine.

***Landscape context from Step 1 can help determine the relevance, strength, and reliability of the indicators observed in the field.**

***Information in Chapter 2 of the OHWM field manual provides information on specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.**

ii. Did recent extreme events and/or land use affect this indicator?

1. Recent floods may have left many extreme flow indicators, or temporarily altered channel form. Other resources will likely be needed to support any OHWM identification at this site. Field evidence of the OHWM may have to wait for the site to recover from the recent flood.
2. Droughts may cause field evidence of OHWM to be obscured, because there has been an extended time since the last high flow event. There can be overgrowth of vegetation or deposition of material from surrounding landscape that can obscure indicators.
3. Both man-made (e.g., dams, construction, mining activities, urbanization, agriculture, grazing) and natural (e.g., fires, floods, debris flows, beaver dams) disturbances can all alter how indicators are expected to appear at a site. Chapter 6 and Chapter 7 of the OHWM field manual provides specific case-studies that can help in interpreting evidence at these sites.

b. Strength:

i. Is this indicator persistent across the landscape?

1. Look up and downstream and across the channel to see if you see the same indicator at multiple locations.
2. Does the indicator occur at the same elevation as other indicators?

c. Reliability:

i. Is this indicator persistent on the landscape over time? Will this indicator still persist across seasons?

1. This can be difficult to determine for some indicators and may be specific to climatic region (in terms of persistence of vegetation) and history of land use or other natural disturbances.
2. Chapter 2, Chapter 6, and Chapter 7 of the OHWM field manual describes each indicator in detail and provides examples of areas where indicators are difficult to interpret.

d. Weigh body of evidence:

i. Combine weights: integrate the weighted line of evidence (relevance, strength, reliability) of each indicator.

ii. For each of the observed indicators, which are more heavily weighted? Where do high value indicators co-occur along the stream reach? Do they co-occur at a similar elevation along the banks relative to water surface (or channel bed if there is no water).

iii. On datasheet, select the indicators used to identify the OHWM. Information in Chapter 2 of the OHWM field manual provides descriptions of specific indicators which can assist in putting these in context and determining relevance, strength, and relieability.

e. Take photographs of indicators and attach a log using either page 2 of datasheet or another method of logging photos.

i. Annotate photos with descriptions of indicators.

Step 4 Is additional information needed? Are other resources needed to support the lines of evidence observed in the field?

a. If additional resources are needed, then repeat steps 3a and 3b for the resources selected in Step 1 of assembling, weighting, and weighing evidence collected from online resources. Chapter 5 of the OHWM field manual provides information on using online resources.

b. Any data collected from online tools have strengths and weaknesses. Make sure these are clear when determining relevance, strength, and reliability of the remotely collected data. Clearly describe why other resources were needed to support the lines of evidence observed in the field, as well as the relevance, strength, and reliability of the supporting data and/or resources.

c. Attach any remote data and data analysis to the datasheet.

Step 5 Describe rationale for location of OHWM:

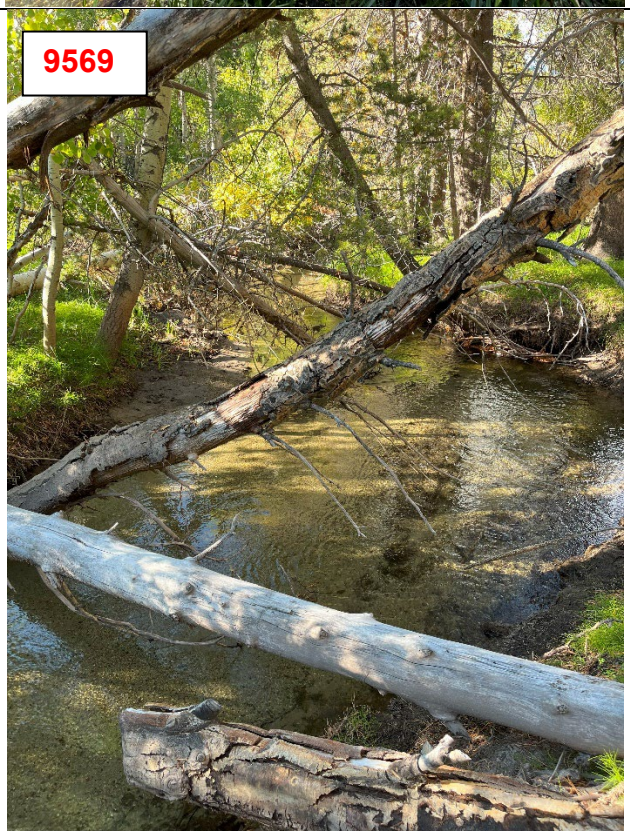
a. Why do the combination of indicators represent the OHWM?

b. If there are multiple possibilites for the OHWM, explain why there are two (or more) possibilities. Include any relevant discussion on why specific indicators were not included in the final decision.

c. If needed, add additional site notes on page 2 of the datasheet under Step 5.

Reversed Creek (REVCRK) Photographs





U.S. Army Corps of Engineers (USACE)

RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-CO-R.

OMB Control No. 0710-XXXX

Approval Expires:

Project ID #: Rush Creek Enhancement Area | Site Name: Perennial Stream 1 | Date and Time: 10/5/23; 4:30 pm

Location (lat/long): 37.764391, -119.120571 | Investigator(s): Robyn Smith + Emily Ferrell

Step 1 Site overview from remote and online resources

Check boxes for online resources used to evaluate site:

- [ ] gage data
- [ ] LiDAR
- [ ] geologic maps
- [ ] climatic data
- [x] satellite imagery
- [ ] land use maps
- [x] aerial photos
- [ ] topographic maps
- [ ] Other: _____

Describe land use and flow conditions from online resources.

Were there any recent extreme events (floods or drought)?

Winter of 2022/2023 was a record high-water year.

Land use nearby is residential and hydroelectric facilities

Step 2 Site conditions during field assessment

First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.

OHWM width = 4 feet

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below `b', at `x', or just above `a' the OHWM.

OHWM. Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:**
  - [x] *on the bank:*
  - [ ] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: _____
- [x] **Shelving:**
  - [x] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* _____
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [ ] **Instream bedforms and other bedload transport evidence:**
  - [ ] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [ ] *bedforms (e.g., poofs, riffles, steps, etc.):*
  - [ ] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [ ] **Secondary channels:**

Sediment indicators

- [ ] **Soil development:**
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [ ] **Changes in particle-sized distribution:**
  - [ ] *transition from* _____ to _____
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:**

Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs).* ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

- [x] *vegetation absent to:* wetland plants on bank
- [ ] *moss to:*
- [ ] *forbs to:*
- [ ] *graminoids to:*
- [ ] *woody shrubs to:*
- [ ] *deciduous trees to:*
- [ ] *coniferous trees to:*
- [x] **Vegetation matted down and/or bent:**
- [ ] **Exposed roots below intact soil layer:**

Ancillary indicators

- [ ] **Wracking/presence of organic litter:**
- [ ] **Presence of large wood:**
- [ ] **Leaf litter disturbed or washed away:**
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators?

Describe:

Step 4 Is additional information needed to support this determination?

- [ ] Yes
- [x] No

If yes, describe and attach information to datasheet:

Project ID #: Enhancement Area

Step 5 Describe rationale for location of OHWM

A clear transition from unvegetated sandy channel to densely vegetated, with a sharp transition in slope at the bank shelf line.

Additional observations or notes

Perennial Stream 1 merges with South Rush Creek (SRC) just before South Rush Creek passes through a culvert under state route 158.

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? [X] Yes [ ] No If no, explain why not: _____

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description
9466	Photo of Perennial Stream 1 near convergence with SRC
9465	Photo of Perennial Stream 1 midway along the delineation
9464	From the edge of the enhancement area boundary.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 1 **Site overview from remote and online resources** **Complete Step 1 prior to site visit.**

Online Resources: Identify what information is available for the site. Check boxes on datasheet next to the resources used to assess this site.

a. gage data
b. aerial photos
c. satellite imagery
d. LiDAR
e. topographic maps
f. geologic maps
g. land use maps
h. climatic data (precipitation and temperature)

Landscape context: Use the online resources to put the site in the context of the surrounding landscape.

a. **Note on the datasheet under Step 1:**
   i. Overall land use and change if known
   ii. Recent extreme events if known (e.g., flood, drought, landslides, debris flows, wildfires)
b. Consider the following to inform weighting of evidence observed during field visit.
   i. What physical characteristics are likely to be observed in specific environments?
   ii. Was there a recent flood or drought? Are you expecting to see recently formed or obscured indicators?
   iii. How will land use affect specific stream characteristics? How natural is the hydrologic regime? How stable has the landscape been over the last year, decade, century?

Step 2 Site conditions during the field assessment (assemble evidence)

a. Identify the assessment area.
b. Walk up and down the assessment area noting all the potential OHWM indicators.
c. Note broad trends in channel shape, vegetation, and sediment characteristics.
   i. Is this a single thread or multi-thread system? Is this a stream-wetland complex?
   ii. Are there any secondary and/or floodplain channels?
   iii. Are there obvious man-made alterations to the system?
   iv. Are there man-made (e.g., bridges, dams, culverts) or natural structures (e.g., bedrock outcrops, Large Wood jams) that will influence or control flow?
d. Look for signs of recurring fluvial action.
   i. Where does the flow converge on the landscape?
   ii. Are there signs of fluvial action (sediment sorting, bedforms, etc.) at the convergence zone?
e. Look for indicators on both banks. If the opposite bank is not accessible, then look across the channel at the bank.
f. **In Step 2 of the datasheet** describe any adjacent land use or flow conditions that may influence interpretation of each line of evidence.
   i. What land use and flow conditions may be affecting your ability to observe indicators at the site?
   ii. What recent extreme events may have caused changes to the site and affected your ability to observe indicators?

Step 3a List evidence

Assemble evidence by checking the boxes next to each line of evidence:

a. If needed, use a separate scratch datasheet to check boxes next to possible indicators, or check boxes of possible indicators in pencil and use pen for final decision.
b. If using fillable form, then follow the instructions for filling in the fillable form.

Context is important when assembling evidence. For instance, pool development may be an indicator of interest on the bed of a dry stream, but may not be a useful indicator to take note of in a flowing stream. On the other hand, if the pool is found in a secondary channel adjacent to the main channel, it could provide a line of evidence for a minimum elevation of high flows. Therefore, consider the site context when deciding which indicators provide evidence for identifying the OHWM. Explain reasoning in Step 5.

Questions to consider while making observations and listing evidence at a site:

Geomorphic indicators
Where are the breaks in slope?
Are there identifiable banks?
Is there an easily identifiable top of bank?
Are the banks actively eroding?
Are the banks undercut?
Are the banks armored?
Is the channel confined by the surrounding hillslopes?
Are there natural or man-made berms and levees?
Are there fluvial terraces?
Are there channel bars?

Sediment and soil indicators
Where does evidence of soil formation appear?

Are there mudcracks present?

Is there evidence of sediment sorting by grain size?

Vegetation Indicators
Where are the significant transitions in vegetation species, density, and age?

Is there vegetation growing on the channel bed?

If no, how long does it take for the non-tolerant vegetation to establish relative to how often flows occur in the channel?

Where are the significant transitions in vegetation?

Is the vegetation tolerant of flowing water?

Has any vegetation been flattened by flowing water?

Ancillary indicators
Is there organic litter present?

Is there any leaf litter disturbed or washed away?

Is there large wood deposition?

Is there evidence of water staining?

Are the following features of fluvial transport present?
Evidence of erosion: obstacle marks, scour, armoring
Bedforms; riffles, pools, steps, knickpoints/headcuts
Evidence of deposition: imbricated clasts, gravel sheets, etc.

In some cases, it may be helpful to explain why an indicator was NOT at the OHWM elevation, but found above or below. It can also be useful to note if specific indicators (e.g., vegetation) are NOT present. For instance, note if the site has no clear vegetation zonation.

Step 3b Weight each line of evidence and weigh body of evidence

Weight each indicator by considering its importance based upon:

***Landscape context from Step 1 can help determine the relevance, strength, and reliability of the indicators observed in the field.**

a. Relevance:

i. Is this indicator left by low, high, or extreme flows?

Tips on how to assess the indicator relative to type of flow:

Consider the elevation of the indicator relative to the channel bed. What is the current flow level based on season or nearby gages? Consider the elevation of the indicator relative to the current flow. If the stream is currently at baseflow and indicator is adjacent to that, then it is likely a low flow indicator. The difference between high and extreme flow indicators can sometimes be difficult to determine.

***Information in Chapter 2 of the OHWM field manual provides information on specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.**

ii. Did recent extreme events and/or land use affect this indicator?

1. Recent floods may have left many extreme flow indicators, or temporarily altered channel form. Other resources will likely be needed to support any OHWM identification at this site. Field evidence of the OHWM may have to wait for the site to recover from the recent flood.
2. Droughts may cause field evidence of OHWM to be obscured, because there has been an extended time since the last high flow event. There can be overgrowth of vegetation or deposition of material from surrounding landscape that can obscure indicators.
3. Both man-made (e.g., dams, construction, mining activities, urbanization, agriculture, grazing) and natural (e.g., fires, floods, debris flows, beaver dams) disturbances can all alter how indicators are expected to appear at a site. Chapter 6 and Chapter 7 of the OHWM field manual provides specific case-studies that can help in interpreting evidence at these sites.

b. Strength:

i. Is this indicator persistent across the landscape?

1. Look up and downstream and across the channel to see if you see the same indicator at multiple locations.
2. Does the indicator occur at the same elevation as other indicators?

c. Reliability:

i. Is this indicator persistent on the landscape over time? Will this indicator still persist across seasons?

1. This can be difficult to determine for some indicators and may be specific to climatic region (in terms of persistence of vegetation) and history of land use or other natural disturbances.
2. Chapter 2, Chapter 6, and Chapter 7 of the OHWM field manual describes each indicator in detail and provides examples of areas where indicators are difficult to interpret.

d. Weigh body of evidence:

i. Combine weights: integrate the weighted line of evidence (relevance, strength, reliability) of each indicator.

ii. For each of the observed indicators, which are more heavily weighted? Where do high value indicators co-occur along the stream reach? Do they co-occur at a similar elevation along the banks relative to water surface (or channel bed if there is no water).

iii. On datasheet, select the indicators used to identify the OHWM. Information in Chapter 2 of the OHWM field manual provides descriptions of specific indicators which can assist in putting these in context and determining relevance, strength, and relieability.

e. Take photographs of indicators and attach a log using either page 2 of datasheet or another method of logging photos.

i. Annotate photos with descriptions of indicators.

Step 4 Is additional information needed? Are other resources needed to support the lines of evidence observed in the field?

a. If additional resources are needed, then repeat steps 3a and 3b for the resources selected in Step 1 of assembling, weighting, and weighing evidence collected from online resources. Chapter 5 of the OHWM field manual provides information on using online resources.

b. Any data collected from online tools have strengths and weaknesses. Make sure these are clear when determining relevance, strength, and reliability of the remotely collected data. Clearly describe why other resources were needed to support the lines of evidence observed in the field, as well as the relevance, strength, and reliability of the supporting data and/or resources.

c. Attach any remote data and data analysis to the datasheet.

Step 5 Describe rationale for location of OHWM:

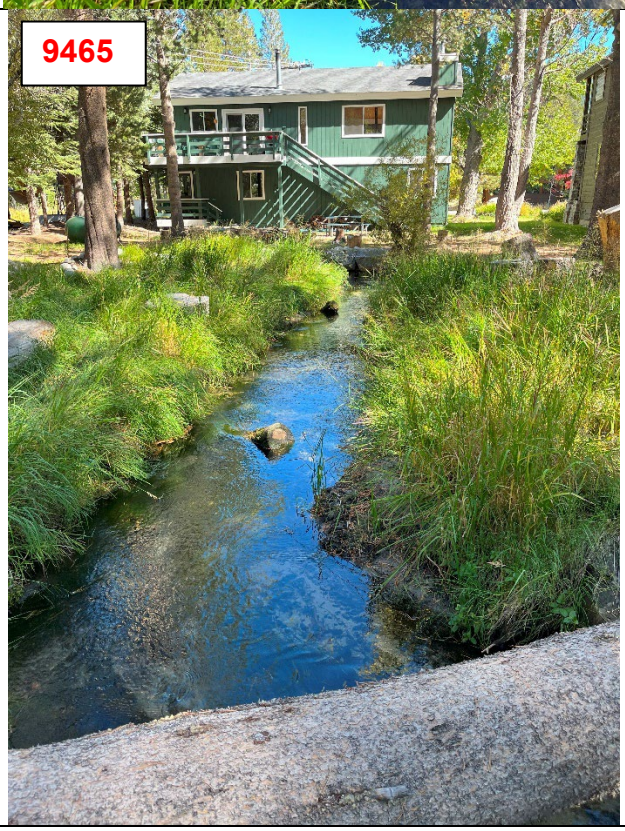
a. Why do the combination of indicators represent the OHWM?

b. If there are multiple possibilites for the OHWM, explain why there are two (or more) possibilities. Include any relevant discussion on why specific indicators were not included in the final decision.

c. If needed, add additional site notes on page 2 of the datasheet under Step 5.

Perennial Stream 1 (PS_01A, PS_01B) Photographs





Perennial Stream 1 (PS_01A, PS_01B) Photographs



U.S. Army Corps of Engineers (USACE)

RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-CO-R.

OMB Control No. 0710-XXXX
Approval Expires:

Project ID #: Enhancement Area | Site Name: South Rush Creek | Date and Time: 10/5/23 11:00 - 3:pm

Location (lat/long): 37.764657, -119.121655 | Investigator(s): Robyn Smith + Emily Ferrell

Step 1 Site overview from remote and online resources
Check boxes for online resources used to evaluate site:

- [ ] gage data
- [ ] LiDAR
- [ ] geologic maps
- [ ] climatic data
- [x] satellite imagery
- [x] land use maps
- [x] aerial photos
- [x] topographic maps
- [ ] Other: _____

Describe land use and flow conditions from online resources.
Were there any recent extreme events (floods or drought)?
Winter of 2022/2023 was a very high water year. Land use is hydroelectric facilities and rural residential properties

Step 2 Site conditions during field assessment
First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.
South Rush Creek is intermittent until it merges with Perennial Stream 1 and flows under State Route 158. At the western edge of enhancement area, some concrete riprap indicates man-made alteration of channel

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.
OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below 'b', at 'x', or just above 'a' the OHWM.
OHWM. Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:**
  - [x] *on the bank:*
  - [x] *undercut bank:*
  - [ ] *valley bottom:*
  - [ ] Other: _____
- [ ] **Shelving:**
  - [ ] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* _____
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [x] **Instream bedforms and other bedload transport evidence:**
  - [ ] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [ ] *bedforms (e.g., poofs, riffles, steps, etc.):*
  - [x] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [ ] **Secondary channels:**

Sediment indicators

- [ ] **Soil development:**
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [x] **Changes in particle-sized distribution:**
  - [x] *transition from* cobble *to* leaf litter/wetland veg.
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:**

Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs)*. ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

- [ ] *vegetation absent to:*
- [ ] *moss to:*
- [x] *forbs to:* conifer
- [ ] *graminoids to:*
- [x] *woody shrubs to:* willows to conifer
- [ ] *deciduous trees to:*
- [ ] *coniferous trees to:*
- [x] **Vegetation matted down and/or bent:**
- [x] **Exposed roots below intact soil layer:**

Ancillary indicators

- [ ] **Wracking/presence of organic litter:**
- [ ] **Presence of large wood:**
- [x] **Leaf litter disturbed or washed away:**
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators?

Describe:
Ancillary indicators were not chosen to map OHWM because South Rush Creek overtopped banks in high water year.

Step 4 Is additional information needed to support this determination?

- [ ] Yes
- [x] No

If yes, describe and attach information to datasheet:

Project ID #: Enhancement Area

Step 5 Describe rationale for location of OHWM

Along the intermittent portion of the stream, the observed break in slope following a consistent elevation contour, along with a transition from presence of cobble to abundant leaf litter the strongest OHWM indicator. In wetland areas, a strong transition from unvegetated streambed to shelved banks noticeable, particularly after the merge with perennial stream 1.

Additional observations or notes

West edge of enhancement area to intersection with Perennial Stream 1
↳ Intermittent Stream

From confluence with Perennial Stream 1 to outlet into Reversed Creek
↳ Perennial Stream

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? [X] Yes [ ] No If no, explain why not: _____

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description
9463	Showing herbaceous vegetation that has established within dry streambed
9462	Showing overgrown Scirpus microcarpus in streambed
9461	"
9460	OHWM shown by change in sediment and break in slope
	All photos taken in intermittent portion of stream.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 1 **Site overview from remote and online resources** **Complete Step 1 prior to site visit.**

Online Resources: Identify what information is available for the site. Check boxes on datasheet next to the resources used to assess this site.

a. gage data
b. aerial photos
c. satellite imagery
d. LiDAR
e. topographic maps
f. geologic maps
g. land use maps
h. climatic data (precipitation and temperature)

Landscape context: Use the online resources to put the site in the context of the surrounding landscape.

a. **Note on the datasheet under Step 1:**
   i. Overall land use and change if known
   ii. Recent extreme events if known (e.g., flood, drought, landslides, debris flows, wildfires)
b. Consider the following to inform weighting of evidence observed during field visit.
   i. What physical characteristics are likely to be observed in specific environments?
   ii. Was there a recent flood or drought? Are you expecting to see recently formed or obscured indicators?
   iii. How will land use affect specific stream characteristics? How natural is the hydrologic regime? How stable has the landscape been over the last year, decade, century?

Step 2 Site conditions during the field assessment (assemble evidence)

a. Identify the assessment area.
b. Walk up and down the assessment area noting all the potential OHWM indicators.
c. Note broad trends in channel shape, vegetation, and sediment characteristics.
   i. Is this a single thread or multi-thread system? Is this a stream-wetland complex?
   ii. Are there any secondary and/or floodplain channels?
   iii. Are there obvious man-made alterations to the system?
   iv. Are there man-made (e.g., bridges, dams, culverts) or natural structures (e.g., bedrock outcrops, Large Wood jams) that will influence or control flow?
d. Look for signs of recurring fluvial action.
   i. Where does the flow converge on the landscape?
   ii. Are there signs of fluvial action (sediment sorting, bedforms, etc.) at the convergence zone?
e. Look for indicators on both banks. If the opposite bank is not accessible, then look across the channel at the bank.
f. **In Step 2 of the datasheet** describe any adjacent land use or flow conditions that may influence interpretation of each line of evidence.
   i. What land use and flow conditions may be affecting your ability to observe indicators at the site?
   ii. What recent extreme events may have caused changes to the site and affected your ability to observe indicators?

Step 3a List evidence

Assemble evidence by checking the boxes next to each line of evidence:

a. If needed, use a separate scratch datasheet to check boxes next to possible indicators, or check boxes of possible indicators in pencil and use pen for final decision.
b. If using fillable form, then follow the instructions for filling in the fillable form.

Context is important when assembling evidence. For instance, pool development may be an indicator of interest on the bed of a dry stream, but may not be a useful indicator to take note of in a flowing stream. On the other hand, if the pool is found in a secondary channel adjacent to the main channel, it could provide a line of evidence for a minimum elevation of high flows. Therefore, consider the site context when deciding which indicators provide evidence for identifying the OHWM. Explain reasoning in Step 5.

Questions to consider while making observations and listing evidence at a site:

Geomorphic indicators	**Sediment and soil indicators**	**Vegetation Indicators**	**Ancillary indicators**
Where are the breaks in slope?	Where does evidence of soil formation appear?	Where are the significant transitions in vegetation species, density, and age?	Is there organic litter present?
Are there identifiable banks?		Is there vegetation growing on the channel bed?	
Is there an easily identifiable top of bank?	Are there mudcracks present?	If no, how long does it take for the non-tolerant vegetation to establish relative to how often flows occur in the channel?	Is there any leaf litter disturbed or washed away?
Are the banks actively eroding?			
Are the banks undercut?	Is there evidence of sediment sorting by grain size?	Where are the significant transitions in vegetation?	Is there large wood deposition?
Are the banks armored?			
Is the channel confined by the surrounding hillslopes?		Is the vegetation tolerant of flowing water?	Is there evidence of water staining?
Are there natural or man-made berms and levees?		Has any vegetation been flattened by flowing water?	
Are there fluvial terraces?			
Are there channel bars?			

Are the following features of fluvial transport present?
Evidence of erosion: obstacle marks, scour, armoring
Bedforms; riffles, pools, steps, knickpoints/headcuts
Evidence of deposition: imbricated clasts, gravel sheets, etc.

In some cases, it may be helpful to explain why an indicator was NOT at the OHWM elevation, but found above or below. It can also be useful to note if specific indicators (e.g., vegetation) are NOT present. For instance, note if the site has no clear vegetation zonation.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 3b Weight each line of evidence and weigh body of evidence

Weight each indicator by considering its importance based upon:

***Landscape context from Step 1 can help determine the relevance, strength, and reliability of the indicators observed in the field.**

a. Relevance:

i. Is this indicator left by low, high, or extreme flows?

Tips on how to assess the indicator relative to type of flow:

Consider the elevation of the indicator relative to the channel bed. What is the current flow level based on season or nearby gages? Consider the elevation of the indicator relative to the current flow. If the stream is currently at baseflow and indicator is adjacent to that, then it is likely a low flow indicator. The difference between high and extreme flow indicators can sometimes be difficult to determine.

***Information in Chapter 2 of the OHWM field manual provides information on specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.**

ii. Did recent extreme events and/or land use affect this indicator?

1. Recent floods may have left many extreme flow indicators, or temporarily altered channel form. Other resources will likely be needed to support any OHWM identification at this site. Field evidence of the OHWM may have to wait for the site to recover from the recent flood.
2. Droughts may cause field evidence of OHWM to be obscured, because there has been an extended time since the last high flow event. There can be overgrowth of vegetation or deposition of material from surrounding landscape that can obscure indicators.
3. Both man-made (e.g., dams, construction, mining activities, urbanization, agriculture, grazing) and natural (e.g., fires, floods, debris flows, beaver dams) disturbances can all alter how indicators are expected to appear at a site. Chapter 6 and Chapter 7 of the OHWM field manual provides specific case-studies that can help in interpreting evidence at these sites.

b. Strength:

i. Is this indicator persistent across the landscape?

1. Look up and downstream and across the channel to see if you see the same indicator at multiple locations.
2. Does the indicator occur at the same elevation as other indicators?

c. Reliability:

i. Is this indicator persistent on the landscape over time? Will this indicator still persist across seasons?

1. This can be difficult to determine for some indicators and may be specific to climatic region (in terms of persistence of vegetation) and history of land use or other natural disturbances.
2. Chapter 2, Chapter 6, and Chapter 7 of the OHWM field manual describes each indicator in detail and provides examples of areas where indicators are difficult to interpret.

d. Weigh body of evidence:

i. Combine weights: integrate the weighted line of evidence (relevance, strength, reliability) of each indicator.

ii. For each of the observed indicators, which are more heavily weighted? Where do high value indicators co-occur along the stream reach? Do they co-occur at a similar elevation along the banks relative to water surface (or channel bed if there is no water).

iii. On datasheet, select the indicators used to identify the OHWM. Information in Chapter 2 of the OHWM field manual provides descriptions of specific indicators which can assist in putting these in context and determining relevance, strength, and relieability.

e. Take photographs of indicators and attach a log using either page 2 of datasheet or another method of logging photos.

i. Annotate photos with descriptions of indicators.

Step 4 Is additional information needed? Are other resources needed to support the lines of evidence observed in the field?

a. If additional resources are needed, then repeat steps 3a and 3b for the resources selected in Step 1 of assembling, weighting, and weighing evidence collected from online resources. Chapter 5 of the OHWM field manual provides information on using online resources.

b. Any data collected from online tools have strengths and weaknesses. Make sure these are clear when determining relevance, strength, and reliability of the remotely collected data. Clearly describe why other resources were needed to support the lines of evidence observed in the field, as well as the relevance, strength, and reliability of the supporting data and/or resources.

c. Attach any remote data and data analysis to the datasheet.

Step 5 Describe rationale for location of OHWM:

a. Why do the combination of indicators represent the OHWM?

b. If there are multiple possibilites for the OHWM, explain why there are two (or more) possibilities. Include any relevant discussion on why specific indicators were not included in the final decision.

c. If needed, add additional site notes on page 2 of the datasheet under Step 5.

South Rush Creek Segment A (SRC_A) Photographs





South Rush Creek Segment A (SRC_A) Photographs





U.S. Army Corps of Engineers (USACE)

RAPID ORDINARY HIGH WATER MARK (OHWM) FIELD IDENTIFICATION DATA SHEET

The proponent agency is Headquarters USACE CECW-CO-R.

OMB Control No. 0710-XXXX

Approval Expires:

Project ID #: Enhancement Area | Site Name: Intermittent Stream 1 | Date and Time: 10/5/23 3:20 pm

Location (lat/long): 37.764349, -119.121113 | Investigator(s): Robyn Smith + Emily Ferrell

Step 1 Site overview from remote and online resources

Check boxes for online resources used to evaluate site:

- [ ] gage data
- [ ] LiDAR
- [ ] geologic maps
- [ ] climatic data
- [x] satellite imagery
- [x] land use maps
- [x] aerial photos
- [x] topographic maps
- [ ] Other: _____

Describe land use and flow conditions from online resources.

Were there any recent extreme events (floods or drought)?

Winter of 2022/2023 a very high water year.
Landuse is hydroelectric facilities and rural residential.

Step 2 Site conditions during field assessment

First look for changes in channel shape, depositional and erosional features, and changes in vegetation and sediment type, size, density, and distribution. Make note of natural or man-made disturbances that would affect flow and channel form, such as bridges, riprap, landslides, rockfalls etc.

Change in vegetation from unvegetated streambed to vegetated banks used as primary change

Step 3 Check the boxes next to the indicators used to identify the location of the OHWM.

OHWM is at a transition point, therefore some indicators that are used to determine location may be just below and above the OHWM. From the drop-down menu next to each indicator, select the appropriate location of the indicator by selecting either just below 'b', at 'x', or just above 'a' the OHWM.

OHWM. Go to page 2 to describe overall rationale for location of OHWM, write any additional observations, and to attach a photo log.

Geomorphic indicators

- [x] **Break in slope:**
  - [ ] *on the bank:*
  - [ ] *undercut bank:*
  - [ ] *valley bottom:*
  - [x] Other: depression in meadow
- [ ] **Shelving:**
  - [ ] *shelf at top of bank:*
  - [ ] *natural levee:*
  - [ ] *man-made berms or levees:*
  - [ ] *other berms:* _____
- [ ] **Channel bar:**
  - [ ] *shelving (berms) on bar:*
  - [ ] *unvegetated:*
  - [ ] *vegetation transition (go to veg. indicators)*
  - [ ] *sediment transition (go to sed. indicators)*
  - [ ] *upper limit of deposition on bar:*
- [ ] **Instream bedforms and other bedload transport evidence:**
  - [ ] *deposition bedload indicators (e.g., imbricated clasts, gravel sheets, etc.)*
  - [ ] *bedforms (e.g., poofs, riffles, steps, etc.):*
  - [ ] *erosional bedload indicators (e.g., obstacle marks, scour, smoothing, etc.)*
- [ ] **Secondary channels:**

Sediment indicators

- [ ] **Soil development:**
- [ ] **Changes in character of soil:**
- [ ] **Mudcracks:**
- [ ] **Changes in particle-sized distribution:**
  - [ ] *transition from* _____ to _____
  - [ ] *upper limit of sand-sized particles*
  - [ ] *silt deposits:*

Vegetation Indicators

- [x] **Change in vegetation type and/or density:**

Check the appropriate boxes and select the general vegetation change *(e.g., graminoids to woody shrubs).* ***Describe the vegetation transition looking from the middle of the channel, up the banks, and into the floodplain.***

- [x] *vegetation absent to:* graminoids
- [ ] *moss to:* Calamagrostis canadensis
- [ ] *forbs to:*
- [ ] *graminoids to:* Elymus glaucus
- [ ] *woody shrubs to:*
- [ ] *deciduous trees to:* Carex sp.
- [ ] *coniferous trees to:*
- [ ] **Vegetation matted down and/or bent:**
- [ ] **Exposed roots below intact soil layer:**

Ancillary indicators

- [ ] **Wracking/presence of organic litter:**
- [ ] **Presence of large wood:**
- [ ] **Leaf litter disturbed or washed away:**
- [ ] **Water staining:**
- [ ] **Weathered clasts or bedrock:**

Other observed indicators?

Describe:

Step 4 Is additional information needed to support this determination?

- [ ] Yes
- [x] No

If yes, describe and attach information to datasheet:

Project ID #: Enhancement area

Step 5 Describe rationale for location of OHWM

Small stream with 2 ft OHWM.
OHWM delineated from lack of vegetation in channel to vegetated banks. Also located in lowest topographic point on the landscape.

Additional observations or notes

Dry at time of survey.

Attach a photo log of the site. Use the table below, or attach separately.

Photo log attached? [X] Yes [ ] No If no, explain why not: _____

List photographs and include descriptions in the table below.

Number photographs in the order that they are taken. Attach photographs and include annotations of features.

Photo Number	Photograph description
9459	Showing unvegetated, litter-strewn streambank
9458	~~Near transect~~ close to edge of enhancement area, stream flows into palustrine forested wetland

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 1 **Site overview from remote and online resources** **Complete Step 1 prior to site visit.**

Online Resources: Identify what information is available for the site. Check boxes on datasheet next to the resources used to assess this site.

a. gage data
b. aerial photos
c. satellite imagery
d. LiDAR
e. topographic maps
f. geologic maps
g. land use maps
h. climatic data (precipitation and temperature)

Landscape context: Use the online resources to put the site in the context of the surrounding landscape.

a. **Note on the datasheet under Step 1:**
   i. Overall land use and change if known
   ii. Recent extreme events if known (e.g., flood, drought, landslides, debris flows, wildfires)
b. Consider the following to inform weighting of evidence observed during field visit.
   i. What physical characteristics are likely to be observed in specific environments?
   ii. Was there a recent flood or drought? Are you expecting to see recently formed or obscured indicators?
   iii. How will land use affect specific stream characteristics? How natural is the hydrologic regime? How stable has the landscape been over the last year, decade, century?

Step 2 Site conditions during the field assessment (assemble evidence)

a. Identify the assessment area.
b. Walk up and down the assessment area noting all the potential OHWM indicators.
c. Note broad trends in channel shape, vegetation, and sediment characteristics.
   i. Is this a single thread or multi-thread system? Is this a stream-wetland complex?
   ii. Are there any secondary and/or floodplain channels?
   iii. Are there obvious man-made alterations to the system?
   iv. Are there man-made (e.g., bridges, dams, culverts) or natural structures (e.g., bedrock outcrops, Large Wood jams) that will influence or control flow?
d. Look for signs of recurring fluvial action.
   i. Where does the flow converge on the landscape?
   ii. Are there signs of fluvial action (sediment sorting, bedforms, etc.) at the convergence zone?
e. Look for indicators on both banks. If the opposite bank is not accessible, then look across the channel at the bank.
f. **In Step 2 of the datasheet** describe any adjacent land use or flow conditions that may influence interpretation of each line of evidence.
   i. What land use and flow conditions may be affecting your ability to observe indicators at the site?
   ii. What recent extreme events may have caused changes to the site and affected your ability to observe indicators?

Step 3a List evidence

Assemble evidence by checking the boxes next to each line of evidence:

a. If needed, use a separate scratch datasheet to check boxes next to possible indicators, or check boxes of possible indicators in pencil and use pen for final decision.
b. If using fillable form, then follow the instructions for filling in the fillable form.

Context is important when assembling evidence. For instance, pool development may be an indicator of interest on the bed of a dry stream, but may not be a useful indicator to take note of in a flowing stream. On the other hand, if the pool is found in a secondary channel adjacent to the main channel, it could provide a line of evidence for a minimum elevation of high flows. Therefore, consider the site context when deciding which indicators provide evidence for identifying the OHWM. Explain reasoning in Step 5.

Questions to consider while making observations and listing evidence at a site:

Geomorphic indicators	**Sediment and soil indicators**	**Vegetation Indicators**	**Ancillary indicators**
Where are the breaks in slope?	Where does evidence of soil formation appear?	Where are the significant transitions in vegetation species, density, and age?	Is there organic litter present?
Are there identifiable banks?			
Is there an easily identifiable top of bank?	Are there mudcracks present?	Is there vegetation growing on the channel bed?	Is there any leaf litter disturbed or washed away?
Are the banks actively eroding?		If no, how long does it take for the non-tolerant vegetation to establish relative to how often flows occur in the channel?	
Are the banks undercut?	Is there evidence of sediment sorting by grain size?		
Are the banks armored?		Where are the significant transitions in vegetation?	Is there large wood deposition?
Is the channel confined by the surrounding hillslopes?			
Are there natural or man-made berms and levees?		Is the vegetation tolerant of flowing water?	Is there evidence of water staining?
Are there fluvial terraces?		Has any vegetation been flattened by flowing water?	
Are there channel bars?			

Are the following features of fluvial transport present?

Evidence of erosion: obstacle marks, scour, armoring
Bedforms; riffles, pools, steps, knickpoints/headcuts
Evidence of deposition: imbricated clasts, gravel sheets, etc.

In some cases, it may be helpful to explain why an indicator was NOT at the OHWM elevation, but found above or below. It can also be useful to note if specific indicators (e.g., vegetation) are NOT present. For instance, note if the site has no clear vegetation zonation.

OHWM Field Identification Datasheet Instructions and Field Procedure

Step 3b Weight each line of evidence and weigh body of evidence

Weight each indicator by considering its importance based upon:

a. Relevance:

i. Is this indicator left by low, high, or extreme flows?

Tips on how to assess the indicator relative to type of flow:

Consider the elevation of the indicator relative to the channel bed. What is the current flow level based on season or nearby gages? Consider the elevation of the indicator relative to the current flow. If the stream is currently at baseflow and indicator is adjacent to that, then it is likely a low flow indicator. The difference between high and extreme flow indicators can sometimes be difficult to determine.

***Landscape context from Step 1 can help determine the relevance, strength, and reliability of the indicators observed in the field.**

***Information in Chapter 2 of the OHWM field manual provides information on specific indicators which can assist in putting these in context and determining relevance, strength, and reliability.**

ii. Did recent extreme events and/or land use affect this indicator?

1. Recent floods may have left many extreme flow indicators, or temporarily altered channel form. Other resources will likely be needed to support any OHWM identification at this site. Field evidence of the OHWM may have to wait for the site to recover from the recent flood.
2. Droughts may cause field evidence of OHWM to be obscured, because there has been an extended time since the last high flow event. There can be overgrowth of vegetation or deposition of material from surrounding landscape that can obscure indicators.
3. Both man-made (e.g., dams, construction, mining activities, urbanization, agriculture, grazing) and natural (e.g., fires, floods, debris flows, beaver dams) disturbances can all alter how indicators are expected to appear at a site. Chapter 6 and Chapter 7 of the OHWM field manual provides specific case-studies that can help in interpreting evidence at these sites.

b. Strength:

i. Is this indicator persistent across the landscape?

1. Look up and downstream and across the channel to see if you see the same indicator at multiple locations.
2. Does the indicator occur at the same elevation as other indicators?

c. Reliability:

i. Is this indicator persistent on the landscape over time? Will this indicator still persist across seasons?

1. This can be difficult to determine for some indicators and may be specific to climatic region (in terms of persistence of vegetation) and history of land use or other natural disturbances.
2. Chapter 2, Chapter 6, and Chapter 7 of the OHWM field manual describes each indicator in detail and provides examples of areas where indicators are difficult to interpret.

d. Weigh body of evidence:

i. Combine weights: integrate the weighted line of evidence (relevance, strength, reliability) of each indicator.

ii. For each of the observed indicators, which are more heavily weighted? Where do high value indicators co-occur along the stream reach? Do they co-occur at a similar elevation along the banks relative to water surface (or channel bed if there is no water).

iii. On datasheet, select the indicators used to identify the OHWM. Information in Chapter 2 of the OHWM field manual provides descriptions of specific indicators which can assist in putting these in context and determining relevance, strength, and relieability.

e. Take photographs of indicators and attach a log using either page 2 of datasheet or another method of logging photos.

i. Annotate photos with descriptions of indicators.

Step 4 Is additional information needed? Are other resources needed to support the lines of evidence observed in the field?

a. If additional resources are needed, then repeat steps 3a and 3b for the resources selected in Step 1 of assembling, weighting, and weighing evidence collected from online resources. Chapter 5 of the OHWM field manual provides information on using online resources.

b. Any data collected from online tools have strengths and weaknesses. Make sure these are clear when determining relevance, strength, and reliability of the remotely collected data. Clearly describe why other resources were needed to support the lines of evidence observed in the field, as well as the relevance, strength, and reliability of the supporting data and/or resources.

c. Attach any remote data and data analysis to the datasheet.

Step 5 Describe rationale for location of OHWM:

a. Why do the combination of indicators represent the OHWM?

b. If there are multiple possibilites for the OHWM, explain why there are two (or more) possibilities. Include any relevant discussion on why specific indicators were not included in the final decision.

c. If needed, add additional site notes on page 2 of the datasheet under Step 5.

Intermittent Stream 1 (IS_01) Photographs





Appendix G.

Aquatic Resources Delineation Data Sheets

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/4/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-001
Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S20 T2S R26E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 1%
Subregion (LRR): D Lat: 4181978.99 mN Long: 313068.35 mE Datum: UTM 11S
Soil Map Unit Name: 170 NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
some disturbance from road and hydro operations

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 1x1)			
1. N/A	—	—	—
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1)			
1. Ericameria nauseosa	3%	N	NI (UPL)
2.			
3.			
4.			
5.			
	3% = Total Cover		
Herb Stratum (Plot size: 1x1)			
1. Bromus tectorum	5%	N	NI (UPL)
2. Erigeron canadensis	40%	Y	FACU
3. Lepidium densiflorum	25%	Y	UPL
4. Euphorbia serpillifolia	10%	Y	NI (UPL)
5. Taraxacum officinale	1%	N	FACU
6. Gilia modocensis	25%	Y	NI (UPL)
7. Verbascum thapsus	3%	N	FACU
8.			
	109% = Total Cover		
Woody Vine Stratum (Plot size: —)			
1. Trifolium repens	1%	N	FACU
2.			
	1% = Total Cover		

% Bare Ground in Herb Stratum 20% % Cover of Biotic Crust 0%

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

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

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

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:
roadside area has sandy soil strata
photo # 9428

SOIL

Sampling Point: EA-001

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0.5 inch	10YR 6/4	100%	N/A	—	—	—	sandy	
0.5-5 in.	10YR 4/3	100%	N/A	—	—	—	sandy-loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rock layer

Depth (inches): 5 inches

Hydric Soil Present? Yes ____ No X

Remarks:

hit an impenetrable rock layer at 5 inches

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ____ No X

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

Aerial photos

Remarks:

very dry sandy area

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/4/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-002
Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S17 T2S R26E
Landform (hillslope, terrace, etc.): bowl Local relief (concave, convex, none): concave Slope (%): 0%
Subregion (LRR): D Lat: 4181990.76 mN Long: 313100.51 mE Datum: UTM 11S
Soil Map Unit Name: 170 NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
area seasonally floods and is within a floodplain but does not show hydric soils – inundation clear on aerial when water overtops banks

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus tremuloides	95%	Y	FACU
2. Pinus contorta	60%	Y	FAC
3.			
4.			
	155% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1)			
1. N/A	–	–	–
2.			
3.			
4.			
5.			
	– = Total Cover		
Herb Stratum (Plot size: 1x1)			
1. Equisetum arvense	1%	N	FAC
2. Schoenoplectus pungens	25%	Y	OBL
3.			
4.			
5.			
6.			
7.			
8.			
	26% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 75% % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 66.6% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

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

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks:
lots of leaf litter, not bare mineral soil

SOIL

Sampling Point: EA-002

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
2 in.	—	—	—	—	—	—	—	organic layer
2-18 in.	10YR 2/2	100%	N/A	-	-	-	sandy loam	no redox or depletion

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

Soil is dark but no redox features and consistent coloring down to 18 inches

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes X No _____

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

aerial photos

Remarks:

aerial photos show saturation — area was known to be saturated earlier in summer

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/4/23

Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-003

Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S20 T2S R26E

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%): 0%

Subregion (LRR): D Lat: 4181962.62 mN Long: 313113.34 mE Datum: UTM 11S

Soil Map Unit Name: 170 NWI classification: none

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

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

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

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

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

Remarks:
photo # 9431
"Emergent Wetland 1" EW-1 in the trimble; later renamed to PEM_01

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A	—	—	—
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1 m)			
1. N/A	—	—	—
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Scirpus microcarpus	100	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. N/A	—	—	—
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 0% % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:
patch along Rush Creek dominated by the bulrush

SOIL

Sampling Point: EA-003

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
12 in.	10 YR 1/1	100%	NA	-	-	-	organic loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- X Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

rotten egg smell immediately upon digging pit

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

Water Table Present? Yes X No ___ Depth (inches): 2 inches

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0-2 in.

Wetland Hydrology Present? Yes X No ___

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/4/23

Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-004

Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S20 T2S R26E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): Convex Slope (%): 0%

Subregion (LRR): D Lat: 4181944.00m N Long: 313112.39m E Datum: UTM 11S

Soil Map Unit Name: 170 NWI classification: none

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

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

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

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

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

Remarks:

FW-1 in trimble; later renamed to PFO-01

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A	–	–	–
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1 m)			
1. Salix lemmonii	30%	Y	FACW
2.			
3.			
4.			
5.			
	30% = Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Equisetum hyemale	60%	Y	FACW
2. Equisetum arvense	1%	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
	61% = Total Cover		
Woody Vine Stratum (Plot size: 1x1 m)			
1. N/A	–	–	–
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 30% % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: EA-004

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
5 in.	10YR 2/1	100%	N/A	-	-	-	sandy	
5-12 in.	10YR 5/1	100%	NA	-	-	-	sandy	mineral soil

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- X Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

Soil so sandy - difficult to determine color but gley visible

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

Water Table Present? Yes X No ___ Depth (inches): 10 inches

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

Wetland Hydrology Present? Yes X No ___

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

Remarks:

was observed to be seasonally inundated in June/July when water table was high

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/4/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-005
Investigator(s): Robyn Smith & Emily Ferrell Section, Township, Range: S20 T2S R26E
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): Convex Slope (%): 1%
Subregion (LRR): D Lat: 4181943.99 mN Long: 313127.61 mE Datum: UTM 11S
Soil Map Unit Name: 170 NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
up on a berm above the bank of rush creek

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 1x1 m)			
1. Pinus contorta	80%	Y	FAC
2.			
3.			
4.			
	80% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1 m)			
1. Salix lasiolepis	20%	Y	FACW
2. Populus tremuloides	10%	Y	FACU
3. Rosa woodsii	1%	N	FACU
4.			
5.			
	31% = Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Equisetum hyemale	40%	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	40% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. N/A	-	-	-
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 60% % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

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

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:
litter deposits on top layer of soil

SOIL

Sampling Point: EA-005

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
5 in.	10YR 3/2	100%	-	-	-	-	Sandy	gravel, stone intermixed

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rock

Depth (inches): 5 inches

Hydric Soil Present? Yes ____ No X

Remarks:

may have shored up bank artificially here at some point, amount of mounded gravel seems unnatural

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- X Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ____ No X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/4/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-006
Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S20 T2S R26E
Landform (hillslope, terrace, etc.): bowl Local relief (concave, convex, none): concave Slope (%): 1%
Subregion (LRR): D Lat: 4181943.06 mN Long: 313137.25 mE Datum: UTM 11S
Soil Map Unit Name: 170 NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
FW-2 in trimble (forested wetland 2) - lodgepole overstory
Later renamed to PFO-02

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiolepis	50%	Y	FACW
2.			
3.			
4.			
	50% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1 m)			
1. Populus tremuloides	5%	N	FACU
2.			
3.			
4.			
5.			
	5% = Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Equisetum arvense	25%	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	25% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. NIA	-	-	-
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum _____ % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

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

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: EA-006

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
4 in.	10YR 2/1	100%	N/A	-	-	-	loamy	
4-10 in.	10YR 5/1	100%	N/A	-	-	-	loamy-clay	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- X Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rock

Depth (inches): 10 inch

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- X Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 4 inches

Wetland Hydrology Present? Yes X No ___

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

Remarks:

bowl depression where Rush Creek overtops and fills bowl with water for part of growing season

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/4/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-007
Investigator(s): Robyn Smith & Emily Ferrell Section, Township, Range: S20 T2S R26E
Landform (hillslope, terrace, etc.): bowl Local relief (concave, convex, none): concave Slope (%): 0%
Subregion (LRR): D Lat: 4181918.72 mN Long: 313106.15 mE Datum: UTM 11S
Soil Map Unit Name: 170 NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
photo # 9439 + 9440. Wetland named PFO-03

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A	–	–	–
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1 m)			
1. Salix lasiolepis	10%	Y	FACW
2. Populus tremuloides	5%	N	FACU
3.			
4.			
5.			
	15% = Total Cover		
Herb Stratum (Plot size: 1x1m)			
1. Calamagrostis canadensis	25%	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	25% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. N/A	–	–	–
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 75% % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

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

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: EA-007

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
2 in.	10YR 2/1	95%	10YR 4/2	5%	D	M	loamy	
2-10 in.	10YR 4/1	100%	-	-	-	-		saturated + mucky

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rock

Depth (inches): 10 inch

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

Water Table Present? Yes X No ___ Depth (inches): 6 in.

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 1 in.

Wetland Hydrology Present? Yes X No ___

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/5/23

Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-008

Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S20 T2S R26E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0%

Subregion (LRR): D Lat: 4181840.14 mN Long: 313196.44 mE Datum: UTM 11S

Soil Map Unit Name: 170 NWI classification: none

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

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

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

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

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

Remarks:
photo # 9445 + 9446; wetland named PFO-04.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix lasiolepis	50%	Y	FACW
2.			
3.			
4.			
	50% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1 m)			
1. N/A	—	—	—
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Carex utriculata	90%	Y	OBL
2. Scirpus microcarpus	10%	N	OBL
3.			
4.			
5.			
6.			
7.			
8.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 1x1 m)			
1. N/A	—	—	—
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 0% % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: EA-008

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
10 in.	10YR 2/2	100%	—	—	—	—	mucky organic	
>10 in.	10YR 5/1	100%	—	—	—	—	sand	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- X Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: N/A

Depth (inches): —

Hydric Soil Present? Yes X No ___

Remarks:

soil in top 10 inches felt very slimy to touch, mix organics

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

Water Table Present? Yes X No ___ Depth (inches): 2 in.

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0 in.

Wetland Hydrology Present? Yes X No ___

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

Remarks:

little bowl offshoot from the South Rush Creek

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/5/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-009
Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S20 T2S R26E
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 1%
Subregion (LRR): D Lat: 4181847.15 mN Long: 313190.61 mE Datum: UTM 11S
Soil Map Unit Name: 170 NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
inundation visible on aerial and plants are wetland but soil lacks wetland characteristics
photo # 9447, 9448, 9449

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 1x1m)			
1. N/A	–	–	–
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1m)			
1. Rosa woodsii	2%	N	FACU
2.			
3.			
4.			
5.			
	2% = Total Cover		
Herb Stratum (Plot size: 1x1m)			
1. Calamagrostis canadensis	60%	Y	FACW
2. Agrostis idahoensis	40%	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 1x1m)			
1. N/A	–	–	–
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 0% % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

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

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks:
break in slope once lodgepole pines create a shelf

SOIL

Sampling Point: EA-009

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
16 in.	10YR 2/2	100%	N/A	-	-	-	loamy	consistent color

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

no oxidized rhizomes, did not hit water table, no redox features

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

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

Wetland Hydrology Present? Yes X No _____

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

Remarks:

area could seasonally flood after snowmelt, but soil is not showing wetland indicators

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/5/23

Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-010

Investigator(s): Robyn Smith & Emily Ferrell Section, Township, Range: S20 T2S R26E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0%

Subregion (LRR): D Lat: 4181838.84mN Long: 313167.23mE Datum: UTM 11S

Soil Map Unit Name: 170 NWI classification: none

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

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

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

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

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

Remarks:
Photo # 9450, 9451, 9452

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1m)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A	—	—	—
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1m)			
1. N/A	—	—	—
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 1x1m)			
1. Dactylis glomerata	60%	Y	FACU
2. Bromus sitchensis	2%	N	NI (UPL)
3. Elymus glaucus	5%	N	FACU
4.			
5.			
6.			
7.			
8.			
	67% = Total Cover		
Woody Vine Stratum (Plot size: 1x1m)			
1. N/A	—	—	—
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 33% % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:
lots of leaf litter in herb stratum

SOIL

Sampling Point: EA - 010

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
6 in.	10 YR 3/3	100%	N/A	-	-	-	loam	lots of gravel / rock

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rock layer

Depth (inches): 6 inches

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ____ No X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/5/23

Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-011

Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S20 T2S R26E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 1%

Subregion (LRR): D Lat: 4181806.01 m N Long: 313210.09 m E Datum: UTM 11S

Soil Map Unit Name: 170 NWI classification: none

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

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

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

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

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

Remarks:
Photo # 9453, 9454; wetland named PFO_05

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A	–	–	–
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1 m)			
1. N/A	–	–	–
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Scirpus microcarpus	50%	Y	OBL
2. Calamagrostis canadensis	50%	Y	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 1x1 m)			
1. N/A	–	–	–
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 0% % Cover of Biotic Crust ____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

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

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

__ Prevalence Index is ≤3.0[1]

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

__ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: EA-011

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8 in.	10YR 2/1	100%	—	—	—	—	sandy loam	mucky
8-16 in.	10YR 2/1	90%	10YR 5/1	10%	D	M	sandy loam	strong contrast

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- X Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- X FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes X No ___

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

Remarks:

inundation visible on aerial from 2018, area was inundated in July 2023

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/5/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-012
Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S20 T2S R26E
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0%
Subregion (LRR): D Lat: 4181794.08mN Long: 313205.75mE Datum: NS UTM
Soil Map Unit Name: 170 NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Wetland named PFO_05

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A	—	—	—
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1 m)			
1. N/A	—	—	—
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Equisetum arvense	33%	Y	FAC
2. Agrostis idahoensis	33%	Y	FACW
3. Glyceria elata	33%	Y	OBL
4.			
5.			
6.			
7.			
8.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 1x1 m)			
1. N/A	—	—	—
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 0% % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

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

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks:
took point in veg transition zone away from scirpus but soil very similar

SOIL

Sampling Point: EA-012

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8 in.	10YR 2/1	100%	–	–	–	–	loamy	slight muck feel
8-16 in.	10YR 2/1	90%	10YR 5/1	10%	D	M	sandy	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

redox features present

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes X No _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/5/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-013
Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S20 T2S R26E
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): convex Slope (%): 2%
Subregion (LRR): D Lat: 4181783.68mN Long: 313151.11mE Datum: UTM 11S
Soil Map Unit Name: 170 NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
on a hillslope above terrace where there is wetland vegetation
Photo # 9455, 9456, 9457

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Abies concolor	50%	Y	NI (UPL)
2.			
3.			
4.			
	50% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1m)			
1. N/A	–	–	–
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 1x1m)			
1. Elymus glaucus	25%	Y	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	25% = Total Cover		
Woody Vine Stratum (Plot size: 1x1m)			
1. N/A	–	–	–
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 75% % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species 25	x 3 = 75
FACU species ____	x 4 = ____
UPL species 50	x 5 = 250
Column Totals: 75 (A)	325 (B)

Prevalence Index = B/A = 4.33

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

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

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:

SOIL

Sampling Point: EA-013

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-2 in.	—	—	—	—	—	—	—	organic leaf litter
2-4 in.	10YR 3/2	100%						
4-12 in.	10YR 5/4	70%					sandy loam	
	10YR 3/2	30%					sandy loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/5/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-014
Investigator(s): Robyn Smith & Emily Ferrell Section, Township, Range: S17 T2S R26E
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 1%
Subregion (LRR): D Lat: 4182049.63 mN Long: 313062.50 mE Datum: UTM 11S
Soil Map Unit Name: 170 NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
probably a riparian area, willows surrounding point
hydrology may be influenced by beginning of tailrace

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 1x1 m)			
1. Populus tremuloides	80%	Y	FACU
2.			
3.			
4.			
	80%	= Total Cover	
Sapling/Shrub Stratum (Plot size: 1x1 m)			
1. N/A	–	–	–
2.			
3.			
4.			
5.			
	0%	= Total Cover	
Herb Stratum (Plot size: 1x1 m)			
1. Poa compressa	5%	N	FACU
2. Schoenoplectus pungens	30%	Y	OBL
3. Carex fracta	5%	N	FAC
4.			
5.			
6.			
7.			
8.			
	40%	= Total Cover	
Woody Vine Stratum (Plot size: 1x1 m)			
1. N/A	–	–	–
2.			
	0%	= Total Cover	

% Bare Ground in Herb Stratum 60% % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	30	x 1 =	30
FACW species		x 2 =	
FAC species	5	x 3 =	15
FACU species	85	x 4 =	340
UPL species		x 5 =	
Column Totals:	120 (A)		385 (B)

Prevalence Index = B/A = 3.21

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

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

Hydrophytic Vegetation Present? Yes ____ No X

Remarks:
Photo # 9473, 9474

SOIL

Sampling Point: EA-014

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-7 in.	10YR 2/2	100%	–	–	–	–		
7 in.	10YR 6/2	100%	–	–	–	–		layer of grayer soil
8-12 in.	10YR 2/2	100%	–	–	–	–		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: rock

Depth (inches): 12 inches

Hydric Soil Present? Yes ____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ____ No X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/5/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-015
Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S20 T2S R26E
Landform (hillslope, terrace, etc.): bowl Local relief (concave, convex, none): concave Slope (%): 0%
Subregion (LRR): D Lat: 4182033.64 m N Long: 313065.47 mE Datum: UTM 11S
Soil Map Unit Name: 170 NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Photo # 9475, 9476, 9477; feature named as PFO-09

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus tremuloides	90%	Y	FACU
2. Salix lemmonii	20%	N	FACW
3.			
4.			
	110% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1 m)			
1. N/A	–	–	–
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Scirpus microcarpus	90%	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	90% = Total Cover		
Woody Vine Stratum (Plot size: 1x1 m)			
1. N/A	–	–	–
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 10% % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	90	x 1 =	90
FACW species	20	x 2 =	40
FAC species		x 3 =	
FACU species	90	x 4 =	360
UPL species		x 5 =	
Column Totals:	200 (A)		490 (B)

Prevalence Index = B/A = 2.45

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

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: EA-015

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16 in.	10YR 2/1	100%	–	–	–	–	loam	mucky organic

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- X Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

Water Table Present? Yes X No _____ Depth (inches): 16 in.

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 10 in.

Wetland Hydrology Present? Yes X No _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/6/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-016
Investigator(s): Robyn Smith & Emily Ferrell Section, Township, Range: S17 T2S R26E
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 1%
Subregion (LRR): D Lat: 4182101.96 mN Long: 313077.72 mE Datum: UTM NS
Soil Map Unit Name: 170 NWI classification: PFOA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Some obligate species, evidence of seasonal inundation but not enough to tip into wetland category

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus tremuloides	90%	Y	FACU
2.			
3.			
4.			
	90% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1m)			
1. N/A	–	–	–
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 1x1m)			
1. Scirpus microcarpus	90%	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	90% = Total Cover		
Woody Vine Stratum (Plot size: 1x1m)			
1. N/A	–	–	–
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 10% (litter) % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	90	x 1 =	90
FACW species		x 2 =	
FAC species		x 3 =	
FACU species	90	x 4 =	360
UPL species		x 5 =	
Column Totals:	180 (A)		450 (B)

Prevalence Index = B/A = 2.5

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

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:
Soil is not hydric and while there was evidence of inundation this year only hydrology indicator is sediment deposited on trees

SOIL

Sampling Point: EA-016

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
12 in.	10YR 2/2	100%	N/A	—	—	—	loamy	
12-18 in.	10YR 3/2	99%	10YR 6/2	1%	D	M	sandy loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

At depth starts to get few redox features but not within top 12 inches of soil as required

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- X Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

Sediment deposits are on aspen line, possibly from 2022-2023 winter extreme flooding

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/6/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-017
Investigator(s): Robyn Smith & Emily Ferrell Section, Township, Range: S17 T2S R26E
Landform (hillslope, terrace, etc.): bowl Local relief (concave, convex, none): concave Slope (%): 0%
Subregion (LRR): D Lat: 4182121.60m N Long: 313069.23 mE Datum: UTM 11S
Soil Map Unit Name: 170 NWI classification: PFOA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
bowl by base of transmission towers, topography may be altered by human activities, connected to Rush Creek floodplain; feature named PFO-10

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. N/A	—	—	—
2.			
3.			
4.			
	0% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1 m)			
1. Populus tremuloides	2%	N	FACU
2.			
3.			
4.			
5.			
	2% = Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Scirpus microcarpus	20%	N	OBL
2. Carex utriculata	70%	Y	OBL
3. Calamagrostis canadensis	10%	N	FACW
4.			
5.			
6.			
7.			
8.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: 1x1 m)			
1. N/A	—	—	—
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 0% % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

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

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: EA-017

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-5 in.	10YR 2/1.5	100%	—	—	—	—	loamy	
5-12 in.	10YR 2/1	80%	10YR 5/2	15%	D	M	loamy - sandy	
			7.5YR 5/4	5%	D	M	loamy - sandy	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- X Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- X Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 10 in.

Wetland Hydrology Present? Yes X No _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/6/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-018
Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S17 T2S R26E
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0%
Subregion (LRR): D Lat: 4182149.38 mN Long: 313062.93 m E Datum: UTM 11S
Soil Map Unit Name: 170 NWI classification: PFOA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus tremuloides	100%	Y	FACU
2.			
3.			
4.			
	100% = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1. N/A	–	–	–
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Scirpus microcarpus	70%	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	70% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1. N/A	–	–	–
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 30% % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species 70	x 1 = 70
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species 100	x 4 = 400
UPL species ____	x 5 = ____
Column Totals: 170 (A)	470 (B)

Prevalence Index = B/A = 2.76

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

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: EA-018

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6 in.	10YR 2/1	100%	—	—	—	—	sandy	
6-12 in.	10YR 3/1	100%	—	—	—	—	loam	
12-16 in.	10YR 4/1	95%	10YR 5/1	10%	D	M		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

depletions do not meet definition of hydric soil

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- X Sediment Deposits (B2) (**Riverine**)
- X Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes X No _____

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

Remarks:

hydrology indicators reflective of abnormal water year

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/6/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-019
Investigator(s): Robyn Smith & Emily Ferrell Section, Township, Range: S17 T2S R26E
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0%
Subregion (LRR): D Lat: 4182080.81 m N Long: 313093.46 m E Datum: UTM 11S
Soil Map Unit Name: 170 NWI classification: PFOA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus tremuloides	85%	Y	FACU
2.			
3.			
4.			
	85% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1 m)			
1. Populus tremuloides	5%	N	FACU
2.			
3.			
4.			
5.			
	5% = Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Scirpus microcarpus	3%	N	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	3% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. N/A	—	—	—
2.			
	0% = Total Cover		

lots of leaf litter
% Bare Ground in Herb Stratum 97% % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 0 (A)
Total Number of Dominant Species Across All Strata: 1 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 0% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

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

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

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: EA-019

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10 in.	10YR 3/2	100%	—	—	—	—	sandy loam	
10-12 in.	10YR 3/2	90%	10YR 6/2	7%	D	M	sandy loam	
			10YR 5/4	3%	C	M	sandy loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

redox features don't meet req. of redox dark surface or depleted dark surface

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- X Sediment Deposits (B2) (**Riverine**)
- X Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes X No _____

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

stream gauge

Remarks:

2022-2023 high flood, water inundated area after snowmelt

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/6/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-020
Investigator(s): Robyn Smith & Emily Ferrell Section, Township, Range: S17 T2S R26E
Landform (hillslope, terrace, etc.): depression in bowl Local relief (concave, convex, none): concave Slope (%): 0%
Subregion (LRR): D Lat: 4182088.15 m N Long: 313104.42 m E Datum: UTM 11S
Soil Map Unit Name: 170 NWI classification: PFOA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus tremuloides	60%	Y	FACU
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. N/A	–	–	–
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Carex utriculata	40%	Y	OBL
2. Scirpus microcarpus	40%	Y	OBL
3.			
4.			
5.			
6.			
7.			
8.			
	80% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. N/A	–	–	–
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 20% % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 66% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

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

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: EA-020

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12 in.	10 YR 2/1	100%	-	-	-	-	loam	thick organic layer

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- X Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- X High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- X Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

Water Table Present? Yes X No ___ Depth (inches): 12 in.

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 0 in.

Wetland Hydrology Present? Yes X No ___

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/6/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-021
Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S17 T2S R26E
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0%
Subregion (LRR): D Lat: 4182093.18 mN Long: 313113.98 mE Datum: UTM 11S
Soil Map Unit Name: 170 NWI classification: PFOA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus contorta	50%	Y	FAC
2. Populus tremuloides	30%	Y	FACU
3.			
4.			
	80% = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. N/A	–	–	–
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Carex utriculata	40%	Y	OBL
2. Scirpus microcarpus	40%	Y	OBL
3.			
4.			
5.			
6.			
7.			
8.			
	80% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1. N/A	–	–	–
2.			
	0% = Total Cover		

% Bare Ground in Herb Stratum 20% % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 4 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

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

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: EA-021

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-10 in.	10YR 3/2	100%	—	—	—	—	sandy loam	
10-12 in.	10YR 3/4	40%	—	—	—	—	sandy loam	
	10YR 3/2	60%	—	—	—	—		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- X Sediment Deposits (B2) (**Riverine**)
- X Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes X No _____

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

Remarks:

2022-2023 was a higher flood year

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/6/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-022
Investigator(s): Robyn Smith & Emily Ferrell Section, Township, Range: S17 T2S R26E
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 1%
Subregion (LRR): D Lat: 313215.26 mE Long: 4182032.56 mN Datum: UTM 11S
Soil Map Unit Name: 170 NWI classification: PFOA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus contorta	90%	Y	FAC
2.			
3.			
4.			
	90% = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1. N/A	-	-	-
2.			
3.			
4.			
5.			
	0% = Total Cover		
Herb Stratum (Plot size: 1 x 1m)			
1. Equisetum arvense	60%	Y	FAC
2. Carex spp.	20%	N	OBL-FAC
3.			
4.			
5.			
6.			
7.			
8.			
	80% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 20% % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

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

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: EA-022

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12 in.	10YR 3/2	45%.	–	–	–	–	sand	dry and crumbly
	10YR 6/2	45%.	–	–	–	–	sand	
	10YR 5/5	10%.	–	–	–	–	sand	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

mottled colors throughout

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- X Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

Sediment line on lodgepoles visible, but could be due to extreme flooding

terrace several feet higher than willow line next to it

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/6/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-023
Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S17 T2S R26E
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 1%
Subregion (LRR): D Lat: 4182061.95mN Long: 313211.76mE Datum: UTM 11S
Soil Map Unit Name: 170bo NWI classification: PFOA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No ____ (If no, explain in Remarks.)
Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes X No ____
Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks: Wetland later named PFO-15

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 1x1m)			
1. Salix geyeriana	20%	Y	OBL
2.			
3.			
4.			
	20% = Total Cover		
Sapling/Shrub Stratum (Plot size: ____)			
1.			
2.			
3.			
4.			
5.			
	____ = Total Cover		
Herb Stratum (Plot size: 1x1m)			
1. Mentha canadensis	20%	N	NI (FAC)
2. Scirpus microcarpus	40%	Y	OBL
3. Carex pellita	40%	Y	OBL
4.			
5.			
6.			
7.			
8.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	____ = Total Cover		

% Bare Ground in Herb Stratum 0% % Cover of Biotic Crust ____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species ____	x 1 =	____
FACW species ____	x 2 =	____
FAC species ____	x 3 =	____
FACU species ____	x 4 =	____
UPL species ____	x 5 =	____
Column Totals: ____ (A)		____ (B)

Prevalence Index = B/A = ____

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

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: EA-023

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-18 in.	10YR 2/1	100%	-	-	-	-	loam	mucky texture

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- X Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

a lot of organic material, feels mucky when wet

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes X No ___

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

Remarks:

inundation visible on aerial imagery from 2018

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: _____

Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-024

Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S17 T2S R26E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 1%

Subregion (LRR): D Lat: 4182092.71 m N Long: 313184.45 m E Datum: 11S UTM

Soil Map Unit Name: 170bo NWI classification: PFOA

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

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

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

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus contorta	100%	Y	FAC
2.			
3.			
4.			
	100% = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Mentha canadensis	10%	N	NI (UPL)
2. Equisetum arvense	5%	N	FAC
3. Calamagrostis canadensis	85%	Y	FACW
4.			
5.			
6.			
7.			
8.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0% % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: _____ (A)		_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: EA-024

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10 in.	10YR 3/2	100%	-	-	-	-	loam	no redox present
10+ in	10YR 3/2	90%	-	-	-	-		
	10YR 3/3	10%	-	-	-	-		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

no inundation visible on aerial imagery

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement area City/County: June Lake, Mono Sampling Date: 10/6/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-025
Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: 517 T2S R26E
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 0%
Subregion (LRR): D Lat: 4182136.15 mN Long: 313140.70 mE Datum: UTM 11S
Soil Map Unit Name: 170 NWI classification: PEM1C
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus contorta	80%	Y	FAC
2.			
3.			
4.			
	80% = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Scirpus microcarpus	10%	N	OBL
2. Carex athrostachya	60%	Y	FACW
3. Dactylis glomerata	2%	N	FACU
4.			
5.			
6.			
7.			
8.			
	72% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 28% % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:	
OBL species _____	x 1 =	_____
FACW species _____	x 2 =	_____
FAC species _____	x 3 =	_____
FACU species _____	x 4 =	_____
UPL species _____	x 5 =	_____
Column Totals: _____ (A)		_____ (B)

Prevalence Index = B/A = _____

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

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: EA-025

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	100%	—	—	—	—	loam	
8-12	10YR 2/1	70%	10YR 4/1	10%	D	M	loam	
			10YR 4/2	10%	D	M		
			10YR 4/4	10%	C	M		

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

redox were not sufficient for depleted dark surface — does not have mucky feel of black histic

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

no indicators but inundation is nearby around willows/meadow

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: _____

Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-026

Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S17 T2S R26E

Landform (hillslope, terrace, etc.): bowl Local relief (concave, convex, none): concave Slope (%): 0%

Subregion (LRR): D Lat: 4182123.53 mN Long: 313149.84 mE Datum: UTM 11S

Soil Map Unit Name: 170 NWI classification: PEM 1C

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

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

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

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

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

Remarks: Labeled as PEM-02 on map.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 1x1m)			
1. Carex pellita	100%	Y	OBL
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	100% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0% % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: EA-026

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/1	100%	–	–	–	–	loam	mucky
8-12	10YR 2/1	99%	7.5YR 4/6	1%	C	M	loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- X Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes X No ___

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, CA Sampling Date: 10/7/23

Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-027

Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S17 T2S R26E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0%

Subregion (LRR): D Lat: 4182034.00 m N Long: 313122.88 m E Datum: UTM 11S

Soil Map Unit Name: 170 NWI classification: PFOA

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

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

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

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

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

Remarks:
SCE conducts vegetation management along the transmission line corridor in area; labeled as PSS_01

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 1x1m)			
1. Salix lasiolepis	40%	Y	FACW
2.			
3.			
4.			
	= Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1m)			
1. Populus tremuloides	30%	Y	FACU
2.			
3.			
4.			
5.			
	= Total Cover		
Herb Stratum (Plot size: 1x1m)			
1. Scirpus microcarpus	55%	Y	OBL
2. Equisetum hyemale	2%	N	FACW
3. Equisetum arvense	2%	N	FAC
4. Carex pellita	40%	Y	OBL
5.			
6.			
7.			
8.			
	99% = Total Cover		
Woody Vine Stratum (Plot size: ____)			
1.			
2.			
	= Total Cover		

% Bare Ground in Herb Stratum 1% % Cover of Biotic Crust ____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 75% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species ____	x 1 = ____
FACW species ____	x 2 = ____
FAC species ____	x 3 = ____
FACU species ____	x 4 = ____
UPL species ____	x 5 = ____
Column Totals: ____ (A)	____ (B)

Prevalence Index = B/A = ____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: EA-027

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 2/1	100%	–	–	–	–	loamy	high organic content mucky

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- X Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) **(LRR C)**
- ___ 1 cm Muck (A9) **(LRR D)**
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) **(LRR C)**
- ___ 2 cm Muck (A10) **(LRR B)**
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No _____

Remarks:

very mucky / slimy feel

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1) **(Nonriverine)**
- ___ Sediment Deposits (B2) **(Nonriverine)**
- ___ Drift Deposits (B3) **(Nonriverine)**
- ___ Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) **(Riverine)**
- ___ Sediment Deposits (B2) **(Riverine)**
- ___ Drift Deposits (B3) **(Riverine)**
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

Saturation Present? (includes capillary fringe) Yes X No _____ Depth (inches): 6 inches

Wetland Hydrology Present? Yes X No _____

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

Remarks:

inundation visible on aerial imagery from 2018

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/7/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-028
Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S20 T2S R26E
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 1%
Subregion (LRR): D Lat: 4182051.41 m N Long: 313131.46 m E Datum: UTM 11S
Soil Map Unit Name: 170 NWI classification: PFOA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
hydrology is abnormal

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1 x 1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Populus tremuloides	100%	Y	FACU
2.			
3.			
4.			
	100% = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 1 x 1 m)			
1. Scirpus microcarpus	60%	Y	OBL
2. Equisetum hyemale	20%	N	FACW
3.			
4.			
5.			
6.			
7.			
8.			
	80% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 20% % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	60	x 1 =	60
FACW species	20	x 2 =	40
FAC species		x 3 =	
FACU species	100	x 4 =	400
UPL species		x 5 =	
Column Totals:	180 (A)		500 (B)

Prevalence Index = B/A = 2.78

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

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:
borderline – understory is dominated by wet associates

SOIL

Sampling Point: EA-028

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/1.5	100%	—	—	—	—	loam	
10-12	10YR 2/1.5	80%	10YR 4/2	20%	D	M	sandy loam	sand layer

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

does not quite meet black histic definition or depleted dark surface area probably does flood but not enough for hydric soil

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- X Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- X Sediment Deposits (B2) (**Riverine**)
- X Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes X No _____

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

Remarks:

2022-2023 an abnormal flood year could be responsible for patterns

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake / Mono Sampling Date: _____

Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-029

Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S20 T2S R26E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0%

Subregion (LRR): D Lat: 4182010.45 mN Long: 313145.38 mE Datum: UTM 11S

Soil Map Unit Name: 170 NWI classification: PFOA

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

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

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

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

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

Remarks:
2022-2023 abnormally high water year

VEGETATION – Use scientific names of plants.

	Absolute % Cover	Dominant Species?	Indicator Status
Tree Stratum (Plot size: 1x1 m)			
1. Populus tremuloides	95%	Y	FACU
2.			
3.			
4.			
	95% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1 m)			
1. Populus tremuloides	50%	Y	FACU
2.			
3.			
4.			
5.			
	50% = Total Cover		
Herb Stratum (Plot size: _____)			
1. Equisetum hyemale	40%	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	40% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 60% % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: EA-029

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 3/2	100%	—	—	—	—	sandy loam	dry + crumbly

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- X Sediment Deposits (B2) (**Riverine**)
- X Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes X No _____

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

Remarks:

2022-2023 abnormal flood year deposited a lot of materials
area was underwater in July

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake, Mono Sampling Date: 10/7/23

Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-030

Investigator(s): Robyn Smith & Emily Ferrell Section, Township, Range: S20 T2S R26E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0%

Subregion (LRR): D Lat: 4181991.11 mN Long: 313171.61 mE Datum: UTM 11S

Soil Map Unit Name: 170 NWI classification: none

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

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

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

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

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

Remarks:
within floodplain of Rush Creek, not a true wetland

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus contorta	100%	Y	FAC
2.			
3.			
4.			
	100% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1 m)			
1. Populus tremuloides	50%	Y	FACU
2.			
3.			
4.			
5.			
	50% = Total Cover		
Herb Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	_____ = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 100% % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species 100	x 3 = 300
FACU species 50	x 4 = 200
UPL species _____	x 5 = _____
Column Totals: 150 (A)	500 (B)

Prevalence Index = B/A = 3.33

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:

SOIL

Sampling Point: EA-030

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-6	10 YR 2/2	100%	–	–	–	–	sandy loam	
6-12	10 YR 3/3	40%	–	–	–	–	sandy loam – more sandy	
	10 YR 2/2	60%	–	–	–	–	sandy loam – more sandy	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- X Sediment Deposits (B2) (**Riverine**)
- X Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes X No _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake / Mono Sampling Date: 10/7/23

Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-031

Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S20 T2S R26E

Landform (hillslope, terrace, etc.): bowl Local relief (concave, convex, none): concave Slope (%): 1%

Subregion (LRR): D Lat: 4181977.99 m N Long: 313158.11 m E Datum: UTM 11S

Soil Map Unit Name: 170 NWI classification: none

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

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

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

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

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

Remarks: Wetland later named PFO_16

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1x1m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus contorta	10%	Y	FAC
2.			
3.			
4.			
	10% = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1m)			
1. Populus tremuloides	5%	N	FACU
2.			
3.			
4.			
5.			
	5% = Total Cover		
Herb Stratum (Plot size: 1x1m)			
1. Equisetum hyemale	80%	Y	FACW
2.			
3.			
4.			
5.			
6.			
7.			
8.			
	80% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 20% % Cover of Biotic Crust _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: EA-031

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR 2/2	100%	—	—	—	—	sandy loam	
4-12	10YR 2/2	70%	10YR 6/2	10%	D	M	sandy loam	
			7.5YR 5/8	20%	C	CS	sandy loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- X Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

almost enough depletions to turn it to depleted dark surface

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- X Sediment Deposits (B2) (**Riverine**)
- X Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes X No ___

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

Remarks:

inundation visible on 2018 aerial imagery

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake / Mono Sampling Date: 10/7/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-032
Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S20 T2S R26E
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%): 0%
Subregion (LRR): D Lat: 4181928.15 mN Long: 313210.30 mE Datum: UTM 11S
Soil Map Unit Name: 170 NWI classification: none
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 1 x 1 m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Pinus contorta	99%	Y	FAC
2.			
3.			
4.			
	99% = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.			
2.			
3.			
4.			
5.			
	_____ = Total Cover		
Herb Stratum (Plot size: 1 x 1 m)			
1. Equisetum arvense	10%	N	FAC
2. Elymus glaucus	30%	Y	FACU
3. Carex spp.	1%	N	OBL-FAC
4.			
5.			
6.			
7.			
8.			
	41% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 59% % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)
Total Number of Dominant Species Across All Strata: 2 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	1	x 1 =	1
FACW species		x 2 =	
FAC species	109	x 3 =	327
FACU species	30	x 4 =	120
UPL species		x 5 =	
Column Totals:	140 (A)		448 (B)

Prevalence Index = B/A = 3.2

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

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

Hydrophytic Vegetation Present? Yes _____ No X

Remarks:
Some facultative species but aspect is more upland
lots of leaf litter and pine needles on ground

SOIL

Sampling Point: EA-032

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 2/2	100%	-	-	-	-	sandy loam	some organic material
8-12	10YR 6/2	100%	-	-	-	-	sand	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No X

Remarks:

no redox or muck to qualify for sandy indicators

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- X Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes _____ No _____ Depth (inches): _____

Water Table Present? Yes _____ No _____ Depth (inches): _____

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

Sediment line barely visible

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake / Mono Sampling Date: 10/7/23

Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-033

Investigator(s): Robyn Smith + Emily Ferrell Section, Township, Range: S20 T2S R26E

Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): convex Slope (%): 1%

Subregion (LRR): D Lat: 4182006.35mN Long: 313210.60mE Datum: UTM 11S

Soil Map Unit Name: 170 NWI classification: PFOA

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

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

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

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

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

Remarks: labeled as PSS_02

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1m)			
1. Salix lasiandra	50%	Y	FACW
2.			
3.			
4.			
5.			
	50% = Total Cover		
Herb Stratum (Plot size: 1x1m)			
1. Scirpus microcarpus	60%	Y	OBL
2. Carex pellita	40%	Y	OBL
3. Equisetum arvense	2%	N	FAC
4.			
5.			
6.			
7.			
8.			
	102% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0% % Cover of Biotic Crust _____

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: EA-033

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

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-12	10YR 2/1	100%	—	—	—	—	sandy loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- X Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

when wet soil felt mucky with high organic content

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- ___ Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes X No ___

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

Remarks:

WETLAND DETERMINATION DATA FORM – Arid West Region

Project/Site: Rush Creek Enhancement Area City/County: June Lake / Mono Sampling Date: 10/7/23
Applicant/Owner: Southern California Edison State: CA Sampling Point: EA-034
Investigator(s): Robyn Smith & Emily Ferrell Section, Township, Range: S20 T2S R26E
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): concave Slope (%): 0%
Subregion (LRR): D Lat: 4182012.36mN Long: 313188.91 mE Datum: UTM 11S
Soil Map Unit Name: 170 NWI classification: PFOA
Are climatic / hydrologic conditions on the site typical for this time of year? Yes X No _____ (If no, explain in Remarks.)
Are Vegetation X, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____
Are Vegetation _____, Soil _____, or Hydrology _____ naturally problematic? (If needed, explain any answers in Remarks.)

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

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

Remarks:
Under transmission line, regular cutting affects amount of woody vegetation; labeled as PSS_03

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	_____ = Total Cover		
Sapling/Shrub Stratum (Plot size: 1x1 m)			
1. Salix lasiolepis	20%	Y	FACW
2.			
3.			
4.			
5.			
	20% = Total Cover		
Herb Stratum (Plot size: 1x1 m)			
1. Mentha canadensis	5%	N	NI (FAC)
2. Carex utriculata	40%	Y	OBL
3. Agrostis idahoensis	60%	Y	FACW
4. Equisetum arvense	1%	N	FAC
5.			
6.			
7.			
8.			
	106% = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.			
2.			
	_____ = Total Cover		

% Bare Ground in Herb Stratum 0% % Cover of Biotic Crust _____

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)
Total Number of Dominant Species Across All Strata: 3 (B)
Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = _____
FACW species _____	x 2 = _____
FAC species _____	x 3 = _____
FACU species _____	x 4 = _____
UPL species _____	x 5 = _____
Column Totals: _____ (A)	_____ (B)

Prevalence Index = B/A = _____

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

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

Hydrophytic Vegetation Present? Yes X No _____

Remarks:

SOIL

Sampling Point: EA-034

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-12	10YR 2/1.5	100%	—	—	—	—	loamy	mucky feel

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ___ Histosol (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Stratified Layers (A5) (**LRR C**)
- ___ 1 cm Muck (A9) (**LRR D**)
- ___ Depleted Below Dark Surface (A11)
- ___ Thick Dark Surface (A12)
- ___ Sandy Mucky Mineral (S1)
- ___ Sandy Gleyed Matrix (S4)
- ___ Sandy Redox (S5)
- ___ Stripped Matrix (S6)
- ___ Loamy Mucky Mineral (F1)
- ___ Loamy Gleyed Matrix (F2)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Vernal Pools (F9)

Indicators for Problematic Hydric Soils[3]:

- ___ 1 cm Muck (A9) (**LRR C**)
- ___ 2 cm Muck (A10) (**LRR B**)
- ___ Reduced Vertic (F18)
- ___ Red Parent Material (TF2)
- ___ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes X No ___

Remarks:

hydrogen sulfide odor when soil was pulled up

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1) (**Nonriverine**)
- ___ Sediment Deposits (B2) (**Nonriverine**)
- ___ Drift Deposits (B3) (**Nonriverine**)
- ___ Surface Soil Cracks (B6)
- X Inundation Visible on Aerial Imagery (B7)
- ___ Water-Stained Leaves (B9)
- ___ Salt Crust (B11)
- ___ Biotic Crust (B12)
- ___ Aquatic Invertebrates (B13)
- X Hydrogen Sulfide Odor (C1)
- X Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Recent Iron Reduction in Tilled Soils (C6)
- ___ Thin Muck Surface (C7)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water Marks (B1) (**Riverine**)
- ___ Sediment Deposits (B2) (**Riverine**)
- ___ Drift Deposits (B3) (**Riverine**)
- ___ Drainage Patterns (B10)
- ___ Dry-Season Water Table (C2)
- ___ Crayfish Burrows (C8)
- ___ Saturation Visible on Aerial Imagery (C9)
- ___ Shallow Aquitard (D3)
- ___ FAC-Neutral Test (D5)

Field Observations:

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

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

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

Wetland Hydrology Present? Yes X No ___

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

aerial photos from 2018

Remarks:

Appendix H.

Wetland Indicator Status of Plant Species Observed in the Study Area

Appendix H. Wetland Indicator Status of Plant Species Observed in the Study Area

Species Common Name	Species Scientific Name	National Wetland Indicator Status[1]	CalFlora Wetland Indicator Status[2]
White fir	*Abies concolor*	NI	No indicator status shown
Idaho bent	*Agrostis idahoensis*	FACW	Occurs usually in wetlands, occasionally in non wetlands
Sitka brome	*Bromus sitchensis*	NI	No indicator status shown
Cheatgrass	*Bromus tectorum*	NI	No indicator status shown
Bluejoint	*Calamagrostis canadensis*	FACW	Occurs usually in wetlands, occasionally in non wetlands
Slender-beak sedge	*Carex athrostachya*	FACW	Occurs usually in wetlands, occasionally in non wetlands
Fragile-sheath sedge	*Carex fracta*	FAC	Equally likely to occur in wetlands and non wetlands
Woolly sedge	*Carex pellita*	OBL	Occurs in wetlands
Northwest territory sedge	*Carex utriculata*	OBL	Occurs in wetlands
Orchard grass	*Dactylis glomerata*	FACU	Occurs usually in non wetlands, occasionally in wetlands
Blue wild rye	*Elymus glaucus*	FACU	Occurs usually in non wetlands, occasionally in wetlands
Field horsetail	*Equisetum arvense*	FAC	Equally likely to occur in wetlands and non wetlands
Tall scouring-rush	*Equisetum hyemale*	FACW	Occurs usually in wetlands, occasionally in non wetlands
Rubber rabbitbrush	*Ericameria nauseosa*	NI	No indicator status shown
Canadian horseweed	*Erigeron canadensis*	FACU	Occurs usually in non wetlands, occasionally in wetlands
Thyme-leafed spurge	*Euphorbia serpillifolia*	NI	No indicator status shown
Modoc gilia	*Gilia modocensis*	NI	No indicator status shown
Tall manna grass	*Glyceria elata*	OBL	Occurs in wetlands
Miner's pepperwort	*Lepidium densiflorum*	UPL	Occurs in non wetlands
Wild mint	*Mentha canadensis*	NI	No indicator status shown
Lodgepole pine	*Pinus contorta*	FAC	Equally likely to occur in wetlands and non wetlands
Flat-stem blue grass	*Poa compressa*	FACU	Occurs usually in non wetlands, occasionally in wetlands
Quaking aspen	*Populus tremuloides*	FACU	Occurs usually in non wetlands, occasionally in wetlands

Appendix H. Wetland Indicator Status of Plant Species Observed in the Study Area

Species Common Name	Species Scientific Name	National Wetland Indicator Status[1]	CalFlora Wetland Indicator Status[2]
Woods' rose	*Rosa woodsii*	FACU	Occurs usually in non wetlands, occasionally in wetlands
Geyer's willow	*Salix geyeriana*	OBL	Occurs in wetlands
Pacific willow	*Salix lasiandra*	FACW	Occurs usually in wetlands, occasionally in non wetlands
Arroyo willow	*Salix lasiolepis*	FACW	Occurs usually in wetlands, occasionally in non wetlands
Lemmon's willow	*Salix lemmonii*	FACW	Occurs usually in wetlands, occasionally in non wetlands
Three-square	*Schoenoplectus pungens*	OBL	Occurs in wetlands
Red-tinge bulrush	*Scirpus microcarpus*	OBL	Occurs in wetlands
Common dandelion	*Taraxacum officianale*	FACU	Occurs usually in non wetlands, occasionally in wetlands
White clover	*Trifolium repens*	FACU	Occurs usually in non wetlands, occasionally in wetlands
Great mullein	*Verbascum thapsus*	FACU	Occurs usually in non wetlands, occasionally in wetlands

[1] Wetland Indicator Status as per the National Wetland Plant List (U.S. Army Corps of Engineers, 2020)
FAC = Equally likely to occur in wetlands and nonwetlands.
FACU = Usually occur in non-wetlands but occasionally found in wetlands
FACW = Usually occur in wetlands but occasionally found in non-wetlands.
NI = Not included on the National Wetland Plant List.
OBL = Obligate wetland species only found in wetlands.
UPL = Upland species not likely to occur in wetlands.
[2] Wetland Indicator Status as per Calflora accounts for each species (Calflora 2023).

Appendix I

Aquatic Resources Excel Sheet

Waters_Name	State	Cowardin_Code	HGM_Code	Meas_Type	Amount	Units	Waters_Type	Latitude	Longitude	Local_Waterway
Rush Creek Powerhouse Tailrace (TI	CALIFORNIA	R2UB		Linear	345	FOOT	A3.TRIB-404	37.76663300	-119.12252100	Rush Creek, Silver Lake
Rush Creek Above Silver Lake (RC)	CALIFORNIA	R2UB		Linear	1285	FOOT	A3.TRIB-404	37.76570300	-119.12176900	Silver Lake
Reversed Creek (REVCRK)	CALIFORNIA	R2UB		Linear	135	FOOT	A3.TRIB-404	37.76639600	-119.12063800	Rush Creek, Silver Lake
South Rush Creek Segment B (SRC_	CALIFORNIA	R2UB		Linear	170	FOOT	A3.TRIB-404	37.76528300	-119.12056200	Rush Creek, Silver Lake
South Rush Creek Segment C (SRC_	CALIFORNIA	R2UB		Linear	444	FOOT	A3.TRIB-404	37.76560200	-119.12071500	Rush Creek, Silver Lake
Perennial Stream 1 Segment A (PS_(	CALIFORNIA	R2UB		Linear	102	FOOT	A3.TRIB-404	37.76439100	-119.12051100	Rush Creek, Silver Lake
Perennial Stream 1 Segment B (PS_(	CALIFORNIA	R2UB		Linear	106	FOOT	A3.TRIB-404	37.76473200	-119.12048900	Rush Creek, Silver Lake
South Rush Creek Segment A (SRC_	CALIFORNIA	R4SB		Linear	497	FOOT	A3.TRIB-404	37.76465700	-119.12165500	Rush Creek, Silver Lake
Intermittent Stream 1 (IS_01)	CALIFORNIA	R4SB		Linear	75	FOOT	A3.TRIB-404	37.76434900	-119.12111300	Rush Creek, Silver Lake
Palustrine Forested Wetland 1 (PFO_	CALIFORNIA	PFO		Area	0.065	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76573000	-119.12179400	Rush Creek, Silver Lake
Palustrine Forested Wetland 2 (PFO_	CALIFORNIA	PFO		Area	0.022	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76567000	-119.12154600	Rush Creek, Silver Lake
Palustrine Forested Wetland 3 (PFO_	CALIFORNIA	PFO		Area	0.043	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76552200	-119.12183500	Rush Creek, Silver Lake
Palustrine Forested Wetland 4 (PFO_	CALIFORNIA	PFO		Area	0.083	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76480000	-119.12086200	Rush Creek, Silver Lake
Palustrine Forested Wetland 5 (PFO_	CALIFORNIA	PFO		Area	0.67	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76451800	-119.12076400	Rush Creek, Silver Lake
Palustrine Forested Wetland 6 (PFO_	CALIFORNIA	PFO		Area	0.028	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76484700	-119.12049300	Rush Creek, Silver Lake
Palustrine Forested Wetland 7 (PFO_	CALIFORNIA	PFO		Area	0.002	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76449100	-119.12045600	Rush Creek, Silver Lake
Palustrine Forested Wetland 8 (PFO_	CALIFORNIA	PFO		Area	0.029	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76434400	-119.12048700	Rush Creek, Silver Lake
Palustrine Forested Wetland 9 (PFO_	CALIFORNIA	PFO		Area	0.111	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76651500	-119.12232600	Rush Creek, Silver Lake
Palustrine Forested Wetland 10 (PFC	CALIFORNIA	PFO		Area	0.389	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76731800	-119.12243100	Rush Creek, Silver Lake
Palustrine Forested Wetland 11 (PFC	CALIFORNIA	PFO		Area	0.082	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76696900	-119.12185100	Rush Creek, Silver Lake
Palustrine Forested Wetland 12 (PFC	CALIFORNIA	PFO		Area	0.135	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76689000	-119.12154000	Rush Creek, Silver Lake
Palustrine Forested Wetland 13 (PFC	CALIFORNIA	PFO		Area	0.179	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76676000	-119.12096700	Rush Creek, Silver Lake
Palustrine Forested Wetland 14 (PFC	CALIFORNIA	PFO		Area	0.22	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76743900	-119.12175500	Rush Creek, Silver Lake
Palustrine Forested Wetland 15 (PFC	CALIFORNIA	PFO		Area	0.502	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76696500	-119.12090000	Rush Creek, Silver Lake
Palustrine Forested Wetland 16 (PFC	CALIFORNIA	PFO		Area	1.086	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76582400	-119.12096700	Rush Creek, Silver Lake
Palustrine Forested Wetland 17 (PFC	CALIFORNIA	PFO		Area	0.03	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76525700	-119.12054200	Rush Creek, Silver Lake
Palustrine Scrub Shrub Wetland 1 (P:	CALIFORNIA	PSS		Area	0.379	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76653300	-119.12164500	Rush Creek, Silver Lake
Palustrine Scrub Shrub Wetland 2 (P:	CALIFORNIA	PSS		Area	0.044	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76629500	-119.12062400	Rush Creek, Silver Lake
Palustrine Scrub Shrub Wetland 3 (P:	CALIFORNIA	PSS		Area	0.28	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76638300	-119.12092300	Rush Creek, Silver Lake
Palustrine Emergent Wetland 1 (PEM	CALIFORNIA	PEM		Area	0.009	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76590000	-119.12173500	Rush Creek, Silver Lake
Palustrine Emergent Wetland 2 (PEM	CALIFORNIA	PEM		Area	0.34	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76728600	-119.12124000	Rush Creek, Silver Lake
Palustrine Emergent Wetland 3 (PEM	CALIFORNIA	PEM		Area	0.024	ACRE	A4-2.ADJ.WET.A2&A3-404	37.76638900	-119.12056300	Rush Creek, Silver Lake

Appendix J

Culvert Information

Appendix J – Culvert Information

Table J-1. Culvert Dimensions for Perennial Stream Flowing Under State Route 158 in the Study Area

Culvert Location: Rush Creek Powerhouse Tailrace **Type: Corrugated Pipe-Arch** **Skew to the Road: 20.1°**							
Culvert Dimensions		**Estimated Original**		**Field Measurements**		**Deformation**	
		Span (in)	**Rise (in)**	**Span(in)**	**Rise (in)**	**Span(in)**	**Rise (in)**
Inlet	Left Barrel	57	38	57	37.5	0	-0.5
	Right Barrel	57	38	58	36.5	1	-1.5
Outlet	Left Barrel	57	38	55	38.5	-2	0.5
	Right Barrel	57	38	58	36	1	-2
Rush Creek above Silver Lake Culverts **Type: Corrugated Pipe-Arch** **Skew to the Road: 19.5°**							
Inlet	Left 1 Barrel	57	38	58.5	35	1.5	-3
	Left 2 Barrel	57	38	58	37	1	-1
	Left 3 Barrel	57	38	58	36.5	1	-1.5
	Right 1 Barrel	57	38	56.5	38	-0.5	0
	Right 2 Barrel	57	38	58	36	1	-2
	Right 3 Barrel	57	38	58	36.5	1	-1.5
South Rush Creek Segment B Culverts[1] **Type: Corrugated Pipe-Arch** **Skew to the Road: 39.6°**							
Inlet	Left Barrel	49	33	49.9	34	0.9	1
	Right Barrel	49	33	49.5	34	0.5	1
Outlet	Left Barrel	49	33	46.7	30.5	-2.3	-2.5
	Right Barrel	49	33	49.6	31	0.6	-2

[1] Due to the skew angle on the headwall the true culvert dimensions were more difficult to measure, therefore span dimensions were calculated from survey points. Measurements may vary based on the rod being slightly out of level. Measurements approximate. All other pipe dimensions were measured with a steel tape measure.

APPENDIX B

Results of Agency Consultation for Reference Population Visits

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From: Janelle Nolan
To: colleen@hydroreform.org; tiffanee.hutton@tu.org; brandy.wood@wildlife.ca.gov; Janelle Nolan; audry.williams@sce.com; matthew.woodhall@sce.com; ed.bianchi@cardno.com; jora@friendsoftheinyo.org; cmcnally-murphy@americanrivers.org; martin.ostendorf@sce.com; patricia.moyer@wildlife.ca.gov; david.moore@sce.com; nicolas.von@sce.com; jill.north@waterboards.ca.gov; greg@monolake.org; eltrescott@hotmail.com; blake.engelhardt@usda.gov; linda@traveloe.com; rajaa.hassan@waterboards.ca.gov; marcy_haworth@fws.gov; anne_mankowski@fws.gov; beth.lawson@wildlife.ca.gov; michael.tovar@wildlife.ca.gov
Cc: Sussman, Patricia
Subject: SCE Rush Creek Project - Results of TERR 1 - Botanical Resources Reference Population Monitoring
Date: Friday, July 14, 2023 8:23:00 AM
Attachments: Mono Lake Lupine Ref Pop Photo.jpg
Lemmon"s MIlk Vetch Ref Pop Photo.jpg
Long Valley Milk Vetch Ref Pop Photo.jpg
White Bark Pine Individual 07072023.jpg

Agency partners,

The purpose of this e-mail is to provide the results of special-status plant reference population monitoring conducted on July 6, 2023 in support of TERR 1 Botanical Resources technical studies for the relicensing of SCE's Rush Creek Hydroelectric Project. Provided below is a table which provides the species and location of each monitoring site, and notes on the phenology of the species and surrounding habitat at the time of the visit. Photographs of the reference populations are attached.

Based on the results of the reference population visits (all species in fruit and/or flower), early season low elevation surveys are planned July 16-21 and early season high elevation surveys are planned for August 7-15.

Species	**Reference Population Location**	**Observations**
Astragalus lemmonii, Lemmon's milk-vetch	Hot Creek Fish Hatchery, Mammoth Lakes, CA 37.664858, -118.883821.	Biologists observed this species flowering, but not yet fruiting. Species was keyed using the Jepson Manual. Other species observed at the site included low sagebrush (*Artemisia arbuscula*), wavy leaved thelypodium (*Thelypodium crispum*), pilose paintbrush (*Castilleja pilosa*), and short rayed alkali aster (*Symphyotrichum frondosum*). Refer to photo, attached. CNDDB form was completed for this observation.
Astragalus johnson-howellii, Long Valley milk-vetch	Little Alkali Lake, off Benton Crossing Road in Mammoth Lakes, CA 37.669807, -118.790810	Biologists observed this species flowering and fruiting. Species was keyed using the Jepson Manual. Other species observed at the site included low sagebrush (*Artemisia arbuscula*), Bigelow monkeyflower (*Diplacus bigelovii*), Anderson larkspur (*Delphinium andersonii*), Cinquefoil tansy (*Sphaeromeria potentilloides*), wavy

		leaved thelypodium (*Thelypodium crispum*), and senescent *Phlox* species. Refer to photo, attached. CNDDB form was completed for this observation.
Lupinus duranii, Mono Lake lupine	1,200 feet northeast of trailhead, near Shell Gas Station near junction of 158/395 37.846469, -119.095600	Biologists observed a large population, both flowering and fruiting. Species was keyed using the Jepson Manual. Other species observed at the site included low sagebrush (*Artemisia arbuscula*), cold desert phlox (*Phlox stansburyi*), Bigelow monkeyflower (*Diplacus bigelovii*), and Brewer's Lupine (*Lupinus breweri*). Refer to photo, attached. CNDDB form was completed for this observation.
Viola purpurea ssp. aurea, golden violet	3,200 feet of Grant Lake	Species was not present/could not be found.
Botrychium crenulatum, scalloped moonwort	Unable to access population due to Tioga Pass Road closure	
Carex vallicola, western valley sedge	Unable to access population due to Tioga Pass Road closure	
Pinus albicaulus, whitebark pine	Minaret Vista point 37.655796, -119.060403	Biologists visited this site at the recommendation of Forest Service (Blake Engelhardt). Whitebark pine individuals and blister rust were observed. Refer to photo, attached. CNDDB form was completed for this observation.

Please let us know if you have any questions,
Janelle

Janelle Nolan
Environmental Compliance/Permitting
Janelle Nolan & Associates Environmental Consulting
Cell: (530) 277-4582
janelle@jna-consulting.com

Janelle Nolan
& associates

From:	Janelle Nolan
To:	brandy.wood@wildlife.ca.gov; patricia.moyer@wildlife.ca.gov; jill.north@waterboards.ca.gov; blake.engelhardt@usda.gov; rajaa.hassan@waterboards.ca.gov; marcy_haworth@fws.gov; anne_mankowski@fws.gov; beth.lawson@wildlife.ca.gov; michael.tovar@wildlife.ca.gov
Cc:	Matthew Woodhall; Ed Bianchi; Sussman, Patricia; Robyn Smith
Subject:	Rush Creek Project - TERR 1 Botanical Resources - Reference Populations Site Visit
Date:	Tuesday, July 4, 2023 8:06:00 AM

Dear Agency Representatives,

Thank you for your responses regarding the reference population site visit. We are planning to conduct the at the populations listed below on Thursday July 6th and July 7th. Blake Englehardt (USFS) may join us for part of the time. We are also planning to visit the white pine blister rust population that USFS has identified.

Following the reference population check, we will provide a summary email detailing the results, including the phenology of the plants and photographs.

Thank you,
Janelle

Janelle Nolan
Environmental Compliance/Permitting
Janelle Nolan & Associates Environmental Consulting
Cell: (530) 277-4582
janelle@jna-consulting.com



From: Janelle Nolan <Janelle@JNA-Consulting.com>
Sent: Monday, June 19, 2023 11:27 AM
To: brandy.wood@wildlife.ca.gov; patricia.moyer@wildlife.ca.gov; jill.north@waterboards.ca.gov; blake.engelhardt@usda.gov; rajaa.hassan@waterboards.ca.gov; marcy_haworth@fws.gov; anne_mankowski@fws.gov; beth.lawson@wildlife.ca.gov; michael.tovar@wildlife.ca.gov
Cc: matthew.woodhall@sce.com; ed.bianchi@cardno.com; Sussman, Patricia <patricia.sussman@stantec.com>; Robyn Smith <robyn@JNA-Consulting.com>
Subject: Terr 1 Botanical Resources TSP - Special-status Plant Reference Populations/Site Visit

Terrestrial Working Group - Agency Representatives,

Consistent with the methods described in the TERR 1 – Botanical Resources Technical Study Plan (TSP) for SCE's Rush Creek Hydroelectric Project, we are contacting resource agencies to identify special-status plant reference populations (to verify the timing of special-status plant surveys) and schedule a reference population site visit.

Based on the blooming periods for special-status plants known or potentially occurring within the vicinity of the Project, we currently planning to conduct botanical surveys within the following time frames:

- Early Season: Anticipated July 15–August 15 (working from low elevation to high elevation)
- Late Season: Anticipated September 1–September 15 (working from low elevation to high elevation)

To support this effort, SCE has reviewed recent CNDDB records, and identified the following special-status populations in the vicinity of June Lake that may be appropriate to assess phenology and refine survey dates. Please let us know if there are other populations in the vicinity of the Project that you think would be appropriate to visit or if these populations are appropriate.

Species	**INF Species of Conservation Concern**	**California Rare Plant Rank**	**CNDDB Occurrence No.(s)**	**Year(s) Observed**	**Attached Map Number**
Early Season Lower Elevation Plants					
Astragalus lemmonii Lemmon's milk-vetch	Yes	1B.2	2	2005	Map 1
Astragalus johnson-howellii Long Valley milk-vetch	Yes	1B.2 (State Rare)	2, 3, and 10	2010–2012	Map 2
Lupinus duranii Mono Lake lupine	Yes	1B.2	17 and 19	1996	Map 3
Viola purpurea ssp. *aurea* golden violet	Yes	2B.2	23	2011	Map 4
Early Season Higher Elevation Plants					
Botrychium crenulatum scalloped moonwort	Yes	2B.2	19	1998	Map 5
Carex vallicola western valley sedge	Yes	2B.3	8	2006	Map 6

We are currently planning to complete the reference population site visit during the **week of July 3,** depending on site conditions. During the reference population site visit, we would also like to visit the white bark pine blister rust (WPBR) location in Mammoth that USFS mentioned in a previous email.

Please provide input on reference populations and if you would like to attend the reference population site visit by **June 26**.

Thank you,

Janelle Nolan
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Janelle Nolan
& associates

From: Janelle Nolan
To: colleen@hydroreform.org; tiffanee.hutton@tu.org; brandy.wood@wildlife.ca.gov; Janelle Nolan; audry.williams@sce.com; matthew.woodhall@sce.com; ed.bianchi@cardno.com; cmcnally-murphy@americanrivers.org; martin.ostendorf@sce.com; patricia.mover@wildlife.ca.gov; david.moore@sce.com; nicolas.von@sce.com; greg@monolake.org; eltrescott@hotmail.com; blake.engelhardt@usda.gov; linda@traveloe.com; rajaa.hassan@waterboards.ca.gov; marcy_haworth@fws.gov; anne_mankowski@fws.gov; beth.lawson@wildlife.ca.gov; michael.tovar@wildlife.ca.gov; allison@friendsoftheinyo.org; kate@kgconsulting.net
Cc: Sussman, Patricia; Robyn Smith; Emily Ferrell; Sara Reece
Subject: Rush Creek Project - TERR 1 Botanical Resources - Late season reference population site visit
Date: Tuesday, September 5, 2023 1:33:37 PM

Terrestrial Working Group -

We completed the late-season reference population visit for the Rush Creek Project relicensing on August 29 and 30, 2023. Based on the results of the survey (e.g., reference populations observed vegetatively, flowering, and/or fruiting), we are planning to initiate late-season botanical surveys for the Project this week (September 6 through 17, 2023). A summary of the reference population site visit results is provided below.

Please let us know if you have any questions or require additional information.

Species	Reference Population Location	CNDDB Last Year Observed	Observations
Low-Elevation Plants			
Potamogeton praelongus, White-stemmed pondweed CRPR 2B.3	June Lake Marina, June Lake, CA 37.78344, -119.07720	1972	No white-stemmed pondweed individuals observed in the marina near the boat docks as described in by the CNDDB occurrence. Non-native *Hydrilla* was observed carpeting the area where *Potamogeton praelongus* was described. A common pondweed species, *Potamogeton nodosus,* was observed in flower at this location.
Mentzelia torreyi, Torrey's blazing star INF Species of Conservation Concern, CRPR 2B.2	Blacks Point, Mono Lake, CA 38.02696, -119.08339	2011	Biologists observed this species flowering and fruiting. Species was keyed using the Jepson Manual. Other species observed at this site included annual psathyrotes (*Psathyrotes annua*) and giant blazing star (*Mentzelia laevicaulis*). A CNDDB form was completed for this observation.
Thelypodium integrifolium* ssp. *complanatum, foxtail thelypodium	Sulphur Pond off Forest Road 3N06 38.08559, -118.96609	1992	Biologists were unable to access this population because a private gate prevented access from Highway 167. Per communication with Michael Tovar, the CDFW biologist who accompanied the reference population visit, the back

INF Species of Conservation Concern, CRPR 2B.2			way to access 3N06 was washed out by erosion during winter storms and was inaccessible.
Tetradymia tetrameres, dune horsebrush INF Species of Conservation Concern, CRPR 2B.2	Alongside road along Forest Road 1N54 38.10918, -118.93389	2015	Biologists observed this species flowering and fruiting. Species was keyed using the Jepson Manual. Other species observed at this site included rabbitbrush (*Ericameria* spp.), big sagebrush (*Artemisia tridentata*), and the congener (*Tetradymia glabrata*). A CNDDB form was completed for this observation.
High-Elevation Plants			
Sabulina stricta, bog sandwort CRPR 2B.3	Tioga Lake, just outside Yosemite	1974	Biologists did not observe this species at this location. This record is from 1974 from a single collection and a non-specific record.
Draba praelta, tall draba CRPR 2B.3	North of Mt. Dana, southeast of Ellery Lake 37.92957, -119.22745	2009	Biologists did not observe *Draba praelta* at this location. Many co-occurring species were in early bloom, such as *Chamerion angustifolium, Aquilegia pubescens.* Late-lasting snowpack (mid-July at this elevation) may have delayed the emergence period for this species.
Potamogeton robbinsii, Robbins' pondweed CRPR 2B.3	Western shore of Walker Lake, 37.87218, -119.16922	1992	Biologists observed this species in a vegetative state growing in deep water along the rocky shoreline. Species was keyed using the Jepson Manual. No other aquatic plants were observed growing near this species on this part of the shoreline. A CNDDB form was completed for this observation.
Silene oregana, Oregon campion CRPR 2B.2	Warren Creek Canyon, Inyo NF 37.96557, -119.23703	1963, 1995 *ID labeled as questionable in the CNDDB record*	Biologists did not observe *Silene oregana* at this location. However, a similar species, *Silene bernardina* (not special-status), was observed in flower and in fruit. All species were keyed using the Jepson Manual. No other *Silene* species were observed.
Salix brachycarpa* var. *brachycarpa, short-fruited willow CRPR 2B.3	Meadow downstream of Gradisky Lake, Inyo NF 37.95498,	1990	Biologists observed this species vegetatively and in fruit. Species was keyed using the Jepson Manual. Other species observed at the site included *Salix orestera,* Carex spp., and *Hackelia*

	-119.25613		spp. A CNDDB form was completed for this observation.

Thank you,

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From: Janelle Nolan <Janelle@JNA-Consulting.com>
Sent: Wednesday, August 23, 2023 12:00 PM
To: colleen@hydroreform.org; tiffanee.hutton@tu.org; brandy.wood@wildlife.ca.gov; audry.williams@sce.com; matthew.woodhall@sce.com; ed.bianchi@cardno.com; cmcnally-murphy@americanrivers.org; martin.ostendorf@sce.com; patricia.moyer@wildlife.ca.gov; david.moore@sce.com; nicolas.von@sce.com; greg@monolake.org; eltrescott@hotmail.com; blake.engelhardt@usda.gov; linda@traveloe.com; rajaa.hassan@waterboards.ca.gov; marcy_haworth@fws.gov; anne_mankowski@fws.gov; beth.lawson@wildlife.ca.gov; michael.tovar@wildlife.ca.gov; allison@friendsoftheinyo.org; kate@kgconsulting.net
Cc: Robyn Smith <robyn@JNA-Consulting.com>; Sara Reece <Sara@JNA-Consulting.com>; Brandi Nessen <brandi@JNA-Consulting.com>
Subject: RE: Rush Creek Project - TERR 1 Botanical Resources - Late season reference population site visit

Terrestrial Working Group -

We have not received any responses to the e-mail below, however, I wanted to let you know that we have scheduled the reference population site visit for August 29th/30th. If you would like to participate, please let me know so that I can connect you with our field lead (Robyn Smith).

Thank you,
Janelle

Janelle Nolan
Environmental Compliance/Permitting

Janelle Nolan & Associates Environmental Consulting
Cell: (530) 277-4582
janelle@jna-consulting.com

From: Janelle Nolan
Sent: Tuesday, August 15, 2023 8:27 AM
To: colleen@hydroreform.org; tiffanee.hutton@tu.org; brandy.wood@wildlife.ca.gov; Janelle Nolan <Janelle@JNA-Consulting.com>; audry.williams@sce.com; matthew.woodhall@sce.com; ed.bianchi@cardno.com; cmcnally-murphy@americanrivers.org; martin.ostendorf@sce.com; patricia.moyer@wildlife.ca.gov; david.moore@sce.com; nicolas.von@sce.com; greg@monolake.org; eltrescott@hotmail.com; blake.engelhardt@usda.gov; linda@traveloe.com; rajaa.hassan@waterboards.ca.gov; marcy_haworth@fws.gov; anne_mankowski@fws.gov; beth.lawson@wildlife.ca.gov; michael.tovar@wildlife.ca.gov; allison@friendsoftheinyo.org; kate@kgconsulting.net
Cc: Robyn Smith <robyn@JNA-Consulting.com>; sara@jna-consulting.com; Brandi Nessen <brandi@JNA-Consulting.com>
Subject: Rush Creek Project - TERR 1 Botanical Resources - Late season reference population site visit

Dear Terrestrial Working Group – Agency Representatives,

Consistent with the methods described in the TERR 1 – Botanical Resources Technical Study Plan (TSP) for SCE's Rush Creek Hydroelectric Project, we are contacting resource agencies to identify special-status plant reference populations (to verify the timing of late season special-status plant surveys) and schedule a reference population site visit.

Based on the blooming periods for special-status plants known or potentially occurring within the vicinity of the Project, we are currently planning to late season botanical surveys September 1– September 15 (working from low elevation to high elevation).

To support the late season reference population site visit, SCE has reviewed recent CNDDB records, and identified the following special-status populations in the vicinity of June Lake that may be appropriate to assess phenology and refine survey dates for the late season surveys. Please let us know if there are other populations in the vicinity of the Project that you think would be appropriate to visit and if you would like to attend the site visit.

	INF Species of	California	CNDDB		

Species	Conservation Concern	Rare Plant Rank	Occurrence No.	Year(s) Observed	Attached Map No.
Sabulina stricta	No	2B.3	14, 17	1974, 1990	1
Agrostis humilis	Yes	2B.3	15	2004	2
Draba praealta	No	2B.3	5	1933 – 2009	3
Potamogeton robbinsii	No	2B.3	6	1992	4
Salix brachycarpa var. *brachycarpa*	No	2B.3	3	1990	5
Silene oregana	No	2B.2	1	1963, 1995	6
Mentzelia torreyi	Yes	2B.2	6	1930 – 2005, 2009, 2011	7
Tetradymia tetrameres	Yes	2B.2	9	2013, 2015	8
Thelypodium integrifolium spp. *complanatum*	Yes	2B.2	12	1998	9
Potamogeton praelongus	No	2B.3	6	1972	10

We are currently planning to complete the reference population site visit during the week of August 28th.

Please provide input on reference populations and if you would like to attend the reference population site visit by August 23.

Thank you,
Janelle

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APPENDIX C

Vegetation Alliances Occurring Within 1 Mile of the FERC Project Boundary

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The following vegetation alliance descriptions are excerpted from *Vegetation Description's, South Sierran Ecological Province, CALVEG Zone 4* (U.S. Department of Agriculture – Forest Service, Region 5; April 27, 2009).

HERB-DOMINATED ALLIANCES

Alpine Grasses and Forbs Alliance (AC)

Prostrate or low-growing perennials and graminoids form the major vegetation components in alpine areas of this botanically diverse type. The Alpine Grasses and Forbs Alliance has been mapped abundantly in the Glaciated Batholith Subsection and occurs occasionally in eight other subsections, most often within an elevation range of about 8,200 to over 13,000 feet (ft) (2501 to 3965 meters [m]). There are generally less woody species present in this Alliance than in the Alpine Mixed Scrub Alliance. Due to high evaporative potential, the short growing season and abrasion or desiccation by wind, morphological adaptions by particular species are often similar to those in the desert. For example, several cushion-forming plants occur within these rocky sites, as well as species with basal rosette-type leaves. Nevertheless, there are a rich variety of herbaceous species that may be found in this Alliance, partially due to diverse habitats and moisture. On dry, open fell-fields, Phlox (*Phlox condensata*) often dominates a site and on granite and metamorphics, Oval-leaved Buckwheat (*Eriogonum ovalifolium*) is a prominent species in many areas. When parent material is marble, Cymopterus (*Cymopterus cinerarius*) may be of major importance along with Phlox on some sites. Local conditions and seed sources contribute heavily to plant diversity in these high elevation areas, such as the occurrence of herbaceous species such as Pussytoes (*Antennaria media*), graminoids such as Sedge (*Carex exerta),* Bluegrass (*Poa* spp.), Pine Needlegrass (*Achnatherum pinetorum*) and Ryegrass (*Elymus* spp.). Other species that may be identified in this Alliance include Prostrate Sibbaldia (*Sibbaldia procumbens*), Knotweed (*Polygonum davisiae*) at lower elevations, Eschscholtz Buttercup (*Ranunculus eschscholtzii*), Rockcress (*Arabis lemmonii*), Mountain Sorrel (*Oxyria digyna),* Pussypaws (*Calyptridium umbellatum*), Indian Paintbrush (*Castilleja lemmonii*), on moist sites, and Columbine (*Aquilegia pubescens*), Prairie Flax (*Linum lewisii*), Dwarf Indian Paintbrush (*Castilleja nana*), Payson's Draba (*Draba paysonii*), Stemless Mock Goldenweed (*Stenotus acaulis*), Jacob's Ladder (*Polemonium pulcherrimum*), Alpineflames (*Pyrrocoma apargioides*)*,* Pygmyflower Rockjasmine (*Androsace septentrionalis*) and Heart Willowweed (*Epilobium obcordatum*). Subshrubs such as Davidson's Penstemon (*Penstemon davidsonii*) may also be found here. This Alliance is associated with moist site types such as Wet Meadows and Shrub Willows and subalpine conifers such as Whitebark Pine (*Pinus albicaulis*) and Lodgepole Pine (*Pinus contorta* ssp. *murrayana*).

Annual Grasses and Forbs Alliance (HG)

Throughout the low elevations of the western slopes of the southern Sierra Nevada, annual grasses such as Bromes (*Bromus* spp.), Needlegrass (*Achnatherum* spp.) and Wild Oats (*Avena* spp.) may dominate rolling hills. Dominant forbs in this Alliance include Owl's Clover (*Orthocarpus* spp.), Fiddleneck (*Amsinckia intermedia*) and Stork's Bill (*Erodium* spp.). They may occur in pure stands or contain an overstory of scattered oaks

(*Quercus* spp.) or California Buckeye (*Aesculus californica*). Associated westside species include hardwoods growing in sheltered areas and conifers such as Gray Pine (*Pinus sabiniana*) or Ponderosa Pine (*P. ponderosa*) in the Upper Foothills Metamorphic Belt and Lower Batholith Subsections. In some areas, this Alliance may dominate a vast array of slopes and aspects due to wildfires, xeric conditions and other factors; on eastside slopes in the Eastern Slopes and Kern Plateau Subsections, recent wildfires have created large grass patches at elevations up to 8,000 ft) (2,440 m) or more. Great Basin species such as Big Sagebrush (*Artemisia tridentata*), Rabbitbrush (*Chrysothamnus* spp.), Singleleaf Pinyon Pine (*P. monophylla*) and Jeffrey Pine (*P. jeffreyi*) are often found adjacent to these patches.

Wet Meadows Alliance (HJ)

This Alliance is partially composed of Sedges (*Carex* spp.), Rushes (*Juncus* spp.) and Spikerushes (*Eleocharis* spp.) and designates yearlong water availability, as in lakeshore, stream bank, perched water tables, and seep areas. Perennial forbs such as Western Bistort (*Polygonum bistortoides*), Monkeyflower (*Mimulus primuloides*) and Corn Lily (*Veratrum californicum*), shrub Willows (*Salix* spp.), Mountain Alder (*Alnus incana* ssp. *tenuifolia*) and Lodgepole Pine (*Pinus contorta* ssp. *murrayana*) may be associated with this high elevation montane alliance. Grasses and grasslike species such as King's Ricegrass (*Ptilagrostis kingii*), Intermediate Oatgrass (*Danthonia intermedia*), Weak Mannagrass (*Torreyochloa pallida*), Hairy Woodrush (*Luzula orestra*), Reedgrass (*Calamagrostis canadensis*) and Bentgrass (*Agrostis idahoensis*) may also be indicators of this type in the southern Sierras.

SHRUB-DOMINATED ALLIANCES

Alpine Mixed Scrub Alliance (AX)

Alpine Mixed Scrub communities are often a mixture of tall and dwarf shrubs and some low graminoid and forb species which often include cushion or rosette-leaved plants that are able to survive harsh climatic conditions above timberline. Species composition varies considerably throughout California. In the Sierra Nevada, the most common subshrubs are Creambush Oceanspray (*Holodiscus discolor*), Greene's Goldenweed (*Ericameria greenei*) and Mountain White Heather (*Cassiope mertensiana*). Shrubby Willows (*Salix* spp.) are also common in this type. Non-shrub species include those represented in the Alpine Grasses and Forbs Alliance. The Alpine Mixed Scrub Alliance has been mapped occasionally in three subsections of the southern Sierras, chiefly in a range of about 8,000 to 12,600 ft (2,440 to 3,843 m) in close proximity to shrubs such as Low Sagebrush (*Artemisia arbuscula*) and to the Alpine Grasses and Forbs Alliance and within patches between stands of subalpine conifers such as Whitebark Pine (*Pinus albicaulis*) and Lodgepole Pine (*Pinus contorta* ssp. *murrayana*). Shrubs such as Low Sagebrush (*Artemisia arbuscula*) and the Alpine Grasses and Forbs Alliance are in the immediate vicinity.

Low Sagebrush Alliance (BL)

Low Sagebrush (*Artemisia arbuscula*), a dwarf and spreading shrub, has been mapped as a dominant shrub extensively in this zone in five subsections at elevations from about 7,000 to 11, 800 ft (2,134 to 3,600 m). It typically grows on sites too harsh for Big Sagebrush (*Artemisia tridentata*), such as those on dry, rocky slopes with shallow or alkaline soils and/or those with prominently exposed bedrock. It is often found in shallow claypan soils, for example, and on warmer slopes at high elevations. When found growing with Black Sagebrush (*Artemisia nova*), it may occupy more saline or alkaline sites. Within the Eastern Slopes Subsection, where the Low Sagebrush type is very common, associated conifers are chiefly Whitebark Pine (*Pinus albicaulis*) and Lodgepole Pine (*Pinus contorta* ssp. *murrayana*) at these high altitudes. Quaking Aspen (*Populus tremuloides*) is sometimes found adjacent to Low Sagebrush sites, as well as the Alpine Grasses and Forbs Alliance. In addition, other Great Basin species, including Mountain Sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and Curlleaf Mountain Mahogany (*Cercocarpus ledifolius*) are typically found within the vicinity of these sites.

Curlleaf Mountain Mahogany Alliance (BM)

This Alliance occurs on gently to steeply sloping mountain uplands and ridge tops, usually in association with rocky outcrops. Curlleaf Mountain Mahogany (*Cercocarpus ledifolius*) has been mapped more frequently in its shrub form than as a tree in the southern Sierras. It is abundant in the Eastern Slopes, Glaciated Batholith and Volcanic Flows and Markleeville Subsections mainly at elevations above about 5,400 ft (1,646 m) and has also been mapped in the Tehachapi - Piute Mountains Subsection. Great Basin shrubs such as Mountain and Low Sagebrush (*Artemisia tridentata* ssp. *vaseyana*, *Artemisia arbuscula*) and conifers such as Jeffrey, Lodgepole and Singleleaf Pinyon Pines (*Pinus jeffreyi*, *Pinus contorta* ssp. *murrayana*, *Pinus monophylla*) occur in the vicinity of this Alliance. Quaking Aspen (*Populus tremuloides*) is occasionally associated with it.

Great Basin Mixed Scrub Alliance (BQ)

A mixture of common Great Basin shrubs defines this type, which has been mapped abundantly in the Eastern Slopes and Markleeville Subsections and less frequently in the Glaciated Batholith, Glaciated Batholith and Volcanic Flows, and Kern Plateau Subsections. Elevation ranges are commonly within about 5,000 to 10,600 ft (1,524 to 3,233 m) in the southern Sierras. The species mixture includes Big Basin Sagebrush (*Artemisia tridentata* ssp. *tridentata*), Mountain Sagebrush (*Artemisia tridentata* ssp. *vaseyana*), Low Sagebrush (*Artemisia arbuscula*), Bitterbrush (*Purshia tridentata*), Curlleaf Mountain Mahogany (*Cercocarpus ledifolius*) and species of Currant (*Ribes* spp.), Snowberry (*Symphoricarpos* spp.) and/or Interior Rose (*Rosa woodsii*). Trees most often found in the vicinity of the Great Basin Mixed Scrub type include Quaking Aspen (*Populus tremuloides*), Jeffrey Pine (*Pinus jeffreyi*), Whitebark Pine (*Pinus albicaulis*) and Lodgepole Pine (*Pinus contorta* ssp. *murrayana*).

Big Sagebrush Alliance (BS)

Big Sagebrush (*Artemisia tridentata*), the dominant shrub of this Alliance, has been mapped separately as Mountain Sagebrush (*Artemisia tridentata* ssp. *vaseyana*) and Big Basin Sagebrush (*Artemisia tridentata* ssp. *tridentata*) in parts of the southern Sierras and especially in the Great Basin Calveg Zone. The subspecies are merged in this alliance and it has been consequently mapped within a wide elevation range, mainly from 3,600 to over 10,000 ft (1,098 to 3,050 m). This alliance is very prominent in the Eastern Slopes and Kern Plateau Subsections, and less so in five others. Big Sagebrush is usually found on frigid soils having little or no soil profile development and in coarse depositional areas, being strongly associated with other Great Basin or dry-site shrubs such as Curlleaf Mountain Mahogany (*Cercocarpus ledifolius*), Bitterbrush (*Purshia tridentata*) and Rabbitbrush (*Chrysothamnus* spp.). It is a main component of several types of mixed shrub communities that are often found in close proximity, including the Great Basin Mixed Scrub, the Great Basin – Mixed Chaparral Transition and the Great Basin – Desert Mixed Scrub Alliances. Eastside trees such as Singleleaf Pinyon Pine (*Pinus monophylla*), Junipers (*Juniperus* spp.), Jeffrey Pine (*Pinus jeffreyi*) and Quaking Aspen (*Populus tremuloides*) occur in the vicinity of this alliance.

Great Basin – Mixed Chaparral Transition Alliance (BX)

This Alliance is a transition type that includes shrub species associated with the Great Basin such as Mountain Big Sagebrush (*Artemisia tridentata* ssp. *vaseyana*), Big Basin Sagebrush (*Artemisia tridentata* ssp. *tridentata*), Low Sagebrush (*Artemisia arbuscula*), Bitterbrush (*Purshia tridentata*), Rabbitbrush (*Chrysothamnus* spp.) and Curlleaf Mountain Mahogany (*Cercocarpus ledifolius*) with an equivalent vegetation cover of upper montane hard chaparral species such as Snowbrush (*Ceanothus velutinus*), Mountain Whitethorn (*Ceanothus cordulatus*), Thimbleberry (*Rubus parviflorus*), and Snowberry (*Symphoricarpos* spp.). Bladderpod (*Isomeris arborea*) and California Buckwheat (*Eriogonum fasciculatum*) may also be present on some of these sites. This type has been mapped frequently at moderate elevations in the Tehachapi – Piute Mountains Subsection (3,800 to 5800 ft or 1,160 to 1,770 m), where this type is adjacent to lower elevation trees such as Canyon Live Oak (*Quercus chrysolepis*), Interior Live Oak (*Quercus wislizenii*) and Gray Pine (*Pinus sabiniana*) and Blue Oak (*Quercus douglasii*) in the west. It occasionally has been mapped at much higher elevations in the Eastern Slopes Subsection (7,400 to 9,600 ft or 2,256 to 2,928 m), where tree associates might include Quaking Aspen (*Populus tremuloides*), Singleleaf Pinyon Pine (*Pinus monophylla*), and Lodgepole Pine (*Pinus contorta* ssp. *murrayana*). It also occurs less abundantly in five other subsections.

Snowbrush Alliance (CV)

Snowbrush (*Ceanothus velutinus* var. *velutinus*), a strongly sprouting shrub, is the dominant shrub species on the eastside slopes of the southern Sierra Nevada in this Alliance. The brush fields of the Snowbrush Alliance occur in upper montane elevation ranges, from about 6,200 to 10,000 ft (1,890 to 3,050 m). Trees such as Jeffrey Pine (*Pinus jeffreyi*), Western (Mountain) Juniper (*Juniperus occidentalis* var. *australis* or *Juniperus grandis*) and Red and White Firs (*Abies magnifica*, *Abies concolor*), and shrubs

such as Greenleaf Manzanita (*Arctostaphylos patula),* Sierra Plum (*Prunus subcordata*), Bitter Cherry (*Prunus emarginata*) and Great Basin shrubs such as Mountain and Low Sagebrush (*Artemisia tridentata* ssp. *vaseyana*, *Artemisia arbuscula*) and Curlleaf Mountain Mahogany (*Cercocarpus ledifolius*) may be found in minor amounts on these sites or in the near vicinity. It may invade deep, well drained soils after fire or logging but occurs on both good and poor soils, with density and vigor of the stand being an indicator of local site conditions. The Snowbrush Alliance has been mapped infrequently in this area in three subsections.

Upper Montane Mixed Chaparral Alliance (CX)

The Upper Montane Mixed Chaparral Alliance is a mid- to upper-elevation shrub type in which no single species is dominant. It has been mapped abundantly in this zone. Species that are commonly found in the mixture include Greenleaf Manzanita (*Arctostaphylos patula*), Mountain Whitethorn (*Ceanothus cordulatus*), Mountain Misery (*Chamaebatia foliolosa*), Deerbrush (*Ceanothus integerrimus*), Huckleberry Oak (*Quercus vaccinifolia*), Bush Chinquapin (*Chrysolepis sempervirens*) and Bitter Cherry (*Prunus emarginata*). Site differences, autoecological factors, and especially fire history account for variability in the mixtures. For example, Deerbrush, a prolific deciduous-leaved seeder, is found on mesic, well-drained soils on westside slopes while Greenleaf Manzanita, a prolific evergreen root-sprouter and seeder, most often is found on xeric sites or on coarse soils on both eastside and westside slopes. Mountain Whitethorn, an evergreen stump-sprouter and prolific seeder, found mainly on the westside, is preferred browse for deer and is often heavily cropped after fires. In the eastside condition, Big Sagebrush (*Artemisia tridentata*), Snowbrush (*Ceanothus velutinus*), an evergreen prolific seeder and vigorous rootcrown-sprouter, Fern Bush (*Chamaebatiaria millefolium*), Snowberry (*Symphoricarpos* spp.) and Squirreltail (*Elymus elymoides*) may occur as species associated with this Alliance.

Shrub Willow Alliance (WL)

Shrub Willows (*Salix* spp.) may dominate stretches of low to high elevation streams, springs and seeps in the southern Sierras. Depending on location and elevation, species may include Geyer's (*Salix geyeriana*), Gray-leaved Sierra (*Salix orestera*), Lemmon's (*Salix lemmonii*), Narrow-leaved (*Salix exigua*), Shining (*Salix lucida*), Yellow (*Salix lutea*), or other Willows. This type has been mapped extensively over ten subsections, most frequently in the Glaciated Batholith, Eastern Slopes, Glaciated Batholith and Volcanic Flows, and Upper Batholith Subsections. On the eastside, it is often found adjacent to upland Great Basin types such as Low, Mountain and Big Sagebrushes (*Artemisia arbuscula*, *Artemisia tridentata* var. *vaseyana*, *Artemisia tridentata*), subalpine and upper montane trees such as Lodgepole Pine (*Pinus contorta* ssp. *murrayana*), Western White Pine (*Pinus monticola*), Red Fir (*Abies magnifica*), Whitebark Pine (*Pinus albicaulis*), Mountain Hemlock (*Tsuga mertensiana*) and Quaking Aspen (*Populus tremuloides*). Mesic shrubs of these elevations, such as Huckleberry Oak (*Quercus vaccinifolia*) also are often found near the Shrub Willow Alliance. As this type may occupy the wettest upland sites, the Wet Meadows Alliance is very frequently associated with it, as are riparian shrubs such as Blue Elderberry (*Sambucus mexicana*), White-stemmed Gooseberry (*Ribes inerme*) and California Blackberry (*Rubus ursinus*). The mapped elevation range of this alliance is extremely broad, ranging from about 3,000 to 12,000 ft (915 – 3,660 m).

TREE-DOMINATED ALLIANCES

Eastside Pine Alliance (EP)

Jeffrey Pine (*Pinus jeffreyi*) alone or in combination with Ponderosa Pine (*Pinus ponderosa*) is a dominant conifer in association with Great Basin understory conifers, trees and shrubs in the Eastside Pine Alliance. Some of the more common shrubs in or adjacent to this Alliance include Mountain Sagebrush (*Artemisia tridentata* ssp. *vaseyana*), Big Basin Sagebrush (*Artemisia tridentata* ssp. *tridentata*), Curlleaf Mountain Mahogany (*Cercocarpus ledifolius*), Rabbitbrush (*Chrysothamnus* spp.), Bitterbrush (*Purshia tridentata*), Snowberry (*Symphoricarpos* spp.), and Ocean Spray (*Holodiscus* spp.). In this region, these sites generally occur at moderate to upper montane elevations, especially between about 5,400 to 10,000 ft (1,646 to 3,050 m), having been mapped extensively in the Eastern Slopes, Kern Plateau, Glaciated Batholith and Volcanic Flows and Tehachapi – Piute Mountains Subsections. This type also has been identified less commonly in two other subsections. Tree associates also occasionally include Singleleaf Pinyon Pine (*Pinus monophylla*), Utah Juniper (*Juniperus osteosperma*), White Fir (*Abies concolor*), Lodgepole Pine (*Pinus contorta* ssp*. murrayana*) and Quaking Aspen (*Populus tremuloides*).

Curlleaf Mountain Mahogany Alliance (FM)

The single-stemmed tree form of Curlleaf Mountain Mahogany (*Cercocarpus ledifolius* var. *intermontanus*) occurs as a dominant hardwood on gently to steeply sloping mountain uplands and ridge tops, usually in association with rocky outcrops. On xeric sites, Curlleaf Mountain Mahogany may occur as the dominant woody species in association with grasses such as Idaho Fescue (*Festuca idahoensis*) and Squirreltail (*Elymus elymoides*). On more mesic sites, associates may include Quaking Aspen (*Populus tremuloides*), Jeffrey Pine (*Pinus jeffreyi*), Singleleaf Pinyon Pine (*Pinus monophylla*) and White Fir (*Abies concolor*) in the southern Sierras. The shrub form of Curlleaf Mountain Mahogany and other Great Basin shrubs such as Mountain and Low Sagebrush (*Artemisia tridentata* ssp. *vaseyana*, *Artemisia arbuscula*) are often found in close proximity to these sites. This Alliance has been mapped occasionally in four subsections, most notably in the Eastern Slopes Subsection at elevations chiefly above about 7,000 ft (2,135 m).

Jeffrey Pine Alliance (JP)

Jeffrey Pine (*Pinus jeffreyi*) assumes dominance on some west slopes of the Sierra Nevada with glacial deposits or on open granitic outcrops above the Ponderosa Pine Alliance. It is considered to be more adaptable to harsher or drier environments than Ponderosa Pine (*Pinus ponderosa*). The Jeffrey Pine Alliance has been mapped very extensively in the Glaciated Batholith, Kern Plateau, Tehachapi - Piute Mountains and Upper Batholith Subsections and frequently in the Lower Batholith, Eastern Slopes, Glaciated Batholith and Volcanic Flows, Upper Batholith and Volcanic Flows and Batholith and Volcanic Flows Subsections. Elevations are generally in the 4,800 to 9,800 ft (1,464 – 2,989 m) range, being higher on the eastside. Associates include White and Red Fir (*Abies concolor*, *Abies magnifica*), Western (Mountain) Juniper (*Juniperus occidentalis* var. *australis*, also called *Juniperus grandis*), Canyon Live and Black Oaks (*Quercus chrysolepis*, *Quercus kelloggii*), and the shrubs Huckleberry Oak (*Quercus vaccinifolia*),

Greenleaf Manzanita (*Arctostaphylos patula*) and Bush Chinquapin (*Chrysolepis sempervirens*).

Lodgepole Pine Alliance (LP)

The Lodgepole Pine (*Pinus contorta* ssp. *murrayana*) Alliance generally occurs within the Red Fir (*Abies magnifica*) elevation range in the southern Sierras, growing in open or closed stands on poorly drained soils or adjacent to meadows. The dominance of this pine in this alliance is usually an indicator of shallow soils formed by glacial scouring or areas having shallow water tables. It has been mapped abundantly in six subsections and less frequently in two others at elevations from about 5,800 to 11,200 ft (1,768 to 3,416 m). Lodgepole Pine is an important invader species following fire or disturbance in the Sierra Nevadas and areas to the east and associates with other upper montane conifers such as Western White Pine (*Pinus monticola*), Foxtail Pine (*Pinus balfouriana*), and Whitebark Pine (*Pinus albicaulis*). It is often found adjacent to those Alliances as well as to the Subalpine Conifer, Wet Meadows, Mixed Conifer – Fir, Upper Montane Mixed Chaparral and Shrub Willow Alliances. In eastside conditions, higher elevation Great Basin shrubs such as Mountain Sagebrush (*Artemisia tridentata* var. *vaseyana*), Rothrock Sagebrush (*Artemisia rothrockii*) and Low Sagebrush (*Artemisia arbuscula*) may be found in close proximity to these sites.

Mixed Conifer – Fir Alliance (MF)

The Mixed Conifer – Fir Alliance is the higher elevation counterpart of the Mixed Conifer - Pine Alliance and is the second most prevalent conifer type of this zone, having been mapped within all subsections. It is especially abundant in the Upper Batholith, Lower Batholith, Kern Plateau, Upper Batholith and Volcanic Flows and Glaciated Batholith Subsections. This Alliance is mostly found within the elevation range of 5,000 to 10,400 ft (1,520 to 3,172 m) on frigid soils in the Southern Sierras. The major species of this mixture include Red Fir (*Abies magnifica*), Western White Pine (*Pinus monticola*) and Lodgepole Pine (*Pinus contorta* ssp. *murrayana*) at the upper elevations and Jeffrey and Ponderosa Pines (*Pinus jeffreyi*, *Pinus ponderosa*) and White Fir (*Abies concolor*) on lower sites. Other shrub associates, including Greenleaf Manzanita (*Arctostaphylos patula*), Huckleberry Oak (*Quercus vaccinifolia*) and Mountain Whitethorn (*Ceanothus cordulatus*) are sometimes present in the understory.

Willow Alliance (QO)

This Alliance is dominated by mixed or single species of tree Willow (*Salix* spp.). It has been mapped most frequently on the east side of the Sierra Nevada where stream or pond conditions provide sufficient moisture in seven subsections at low to moderate elevations, mostly from about 2,600 to 7,400 ft (792 to 2,256 m). Riparian hardwoods such as Water Birch (*Betula occidentalis*) and Fremont Cottonwood (*Populus fremontii*) often occur in close proximity to these areas, while Great Basin upland shrub species such as Rabbitbrush (*Chrysothamnus* spp.), Interior Rose (*Rosa woodsii*), and Big Sagebrush (*Artemisia tridentata*) may occur in narrow canyons adjacent to this Alliance.

Quaking Aspen Alliance (QQ)

Quaking Aspen (*Populus tremuloides*) forms clonal stands and dominates the hardwoods in this Alliance. In the southern Sierras, it occurs at high elevations as an indicator of moist conditions in association with Red Fir (*Abies magnifica*), Lodgepole Pine (*Pinus contorta* ssp. *murrayana*), Whitebark Pine (*Pinus albicaulis*), and Jeffrey Pine (*Pinus jeffreyi*). The Quaking Aspen Alliance has been mapped with some frequency in the Eastern Slopes Subsection, generally above an elevation of about 4,600 ft (1,402 m). In this eastside region, its associated shrubs have Great Basin affinities: Mountain Sagebrush (*Artemisia tridentata* ssp. *vaseyana*), Curlleaf Mountain Mahogany (*Cercocarpus ledifolius*) and Low Sagebrush (*Artemisia arbuscula*). It also occurs less commonly in seven other subsections. At higher elevations and under exposed conditions, Quaking Aspen stands may maintain a shrub-like form and never reach tree sizes.

Subalpine Conifers Alliance (SA)

A mixture of high-elevation conifers in this region has been identified as the Subalpine Conifers Alliance. Depending on latitude and other environmental factors, the mixture includes three or more of the following species: Mountain Hemlock (*Tsuga mertensiana*), Lodgepole Pine (*Pinus contorta* ssp. *murrayana*), Western White Pine (*Pinus monticola*), Foxtail Pine (*Pinus balfouriana*), Red Fir (*Abies magnifica*), Limber Pine (*Pinus flexilis*) and/or Whitebark Pine (*Pinus albicaulis*). Hardwoods such as Aspen (*Populus tremuloides*) are rarely associated with this Alliance, but shrubs such as Willows (*Salix* spp.) and Low Sagebrush (*Artemisia arbuscula*) are often found adjacent to this type. The Subalpine Conifers Alliance has been abundantly mapped on westside and eastside sites in five subsections and less frequently in four others, where the general elevation range is approximately 7,600 to 11,800 ft (2,318 to 3,599 m).

Whitebark Pine Alliance (WB)

This Alliance is dominated by Whitebark Pine (*Pinus albicaulis*), occurring on high windswept ridges at the uppermost Red Fir or subalpine zone, having been mapped most frequently within the elevation range 8,600 to 12,000 ft (2,623 to 3,660 m) in this zone. In these areas, a krummholzed form is common, but an upright form also grows in areas of glacial scouring where soil development is poor. It has been identified with some abundance in the Glaciated Batholith and Eastern Slopes Subsections, and also occurs in four other subsections in the southern Sierras. Lodgepole Pine (*Pinus contorta* ssp. *murrayana*), Western White Pine (*Pinus monticola*) and Foxtail Pine (*Pinus balfouriana*) are the main conifer associates on these open sites with typical understories of alpine grasses and forbs.

White Fir Alliance (WF)

White Fir (*Abies concolor*) occurs in pure stands in this Alliance, which is usually found at elevations higher than the Mixed Conifer-Fir Alliance in which White Fir has favorable conditions for its regeneration. This type has been mapped in scattered locations of all ten subsections of the southern Sierras zone at elevations generally between about 4,800 to 9,400 feet (1,464 to 2,866 m), the higher altitudes being on the eastside. Ponderosa and Jeffrey Pines (*Pinus ponderosa*, *P. jeffreyi*) are very occasionally associated. These

stands usually have both a White Fir overstory and understory. There are few understory shrubs as litter accumulation is usually quite high but scattered Pipsissewa and Wintergreen (*Chimaphila menziesii* and *Pyrola picta*) may occur. At its higher elevations, White Fir overlaps the elevational distribution of Red Fir (*Abies magnifica*) and they often occur together.

Western (Mountain) Juniper Alliance (WJ)

Western or Mountain Juniper (*Juniperus occidentalis* var. *australis*, also called *Juniperus grandis*), a very long-lived, shade-intolerant conifer, is characteristic of warm, dry and often windy upper slopes. Although fairly wind-firm, its short form becomes windtrained and picturesque on exposed sites. Scattered junipers on open sites may dominate such areas and form this alliance. This type has been mapped in the southern Sierras at elevations mainly between about 6,400 to 10,000 ft (1,952 to 3,050 m). It occurs, commonly in association with Jeffrey Pine (*Pinus jeffreyi*); on relatively open stands, on granitic, exposed sites of higher slopes and ridges. The Mountain Juniper Alliance has been mapped extensively in the Glaciated Batholith Subsection and more sparsely in five others. Species adjacent to and within this type include Huckleberry Oak (*Quercus vaccinifolia*), Red Fir (*Abies magnifica*), Western White Pine (*Pinus monticola*), Lodgepole Pine (*Pinus contorta* ssp. *murrayana*) and Mountain Whitethorn (*Ceanothus cordulatus*).

NON-VEGETATED AREAS

Barren (BA)

Landscapes generally devoid of vegetation as seen from a high-altitude image source such as aerial photography, are labeled as Barren. This category includes mappable landscape units in which surface lithology is dominant, such as exposed bedrock, cliffs, interior sandy or gypsum areas, and the like. It does not include areas considered as modified or developed, as in urban areas, but may include quarries and mine sites.

Urban-related Non-vegetated (IB)

Urban development in California occurs in phases. When land is cleared prior to being paved, this category represents the occurrence of non-vegetated barren ground that is caused by urbanization. This land-use type also represents other mechanically-caused barren ground, such as open quarries or mined areas, barren ground along highways, and other areas cleared of vegetation prior to, during, and after construction. This category has been mapped throughout this state, usually adjacent to agricultural areas, already established urbanized centers or other paved areas.

Water (WA)

Water is labeled in Calveg mapping in those cases in which permanent sources of surface water are identified within a landscape unit of sufficient size to be mapped. The category includes lakes, streams and canals of various size, bays and estuaries and similar water bodies. These areas are considered to have a minimum of vegetation components, except along the edges, which may be mapped as types such as Wet Meadows, Tule-Cattail

freshwater marshes, or Pickleweed-Cordgrass saline or mixed marshes. Islands within water bodies may be mapped according to their terrestrial dominant vegetation types.

In addition, surface water bodies have recently been mapped separately in some parts of this zone under the following categories:

- W1: Rivers and Streams (natural, flowing surface waters)
- W2: Perennial Lakes and Ponds (natural lacustrine bodies)
- W3: Reservoirs (man-made lakes and ponds)
- W5: Playas (desert basin features)
- W6: Intermittent Stream Channel (seasonally flowing channeled waters)
- W8: Intermittent or Seasonal Lake or Pond (occasionally drained surface waters)
- W9: Exposed non-water features such as gravel, sand bars, etc.

APPENDIX D

Special-Status Plant Species Known to Occur or Potentially Occurring in the Study Area

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Appendix D. Special-Status Plant Species Known to Occur or Potentially Occurring in the Study Area.

Scientific/Common Name	Federal/ State Status	Inyo National Forest Status	California Rare Plant Rank (CRPR)	Blooming Period/Fertile	Habitat	Likelihood for Occurrence
Known to Occur in the Study Area						
Pinus albicaulis whitebark pine	FT	—	—	Year-round	An alpine white pine that typically occurs on cold and windy high elevation sites in western North America in subalpine forest from 7,000 to 12,000 feet.	**Known to occur in the FERC Project boundary.** A total of 38 whitebark pine populations were conclusively identified in the FERC Project boundary during surveys in 2023. An additional 11 populations lacked mature bark and cones and therefore were identified as unknown five-needle pines. A total of 1,194 whitebark pine individuals were identified. A population of whitebark pine (6 individuals) is present approximately 500 feet downstream of Rush Meadows Dam adjacent to the south bank of Rush Creek (SCE 2018). A population of 6 individuals and 9 seedlings is present along the southeastern side of Gem Lake Dam, between the bunkhouse and the Gem Lake Dam spillway (SCE 2020). Refer to Map TERR 1-3 for the location of all whitebark pine observations.
Suitable Habitat is Present, Not Observed During 2023 Surveys						
Agrostis humilis alpine bentgrass	—	FSCC	2B.3	July – September	Wetlands and meadows within subalpine forest habitats from 5,000 to 11,200 feet.	May potentially occur in appropriate habitat. This species was observed in 2022 at two long-term riparian monitoring sites along Rush Creek Below Rush Meadows Dam (E. Read and Associates, Inc. 2023). The species was observed at very low (<1%) cover while conducting belt transect studies at these sites. Alpine bentgrass has been observed at low cover intermittently on these transects since long-term monitoring was initiated in 1999 (E. Read and Associate, Inc. 2023), but the species was not detected in every year that the monitoring was conducted (it was not detected during 2009 or 2018 monitoring visits). Alpine bentgrass was not observed during the special-status plant surveys in 2023, perhaps because climatic conditions were not suitable for this species to emerge.
Arabis repanda var. *greenei* Greene's rockcress	—	—	3.3	July – August	Rock outcrops, talus, gravelly soil in meadows, and open pine forest from 7,600 to 11,850 feet.	May potentially occur in appropriate habitat.
Astragalus johannis-howellii Long Valley milk-vetch	SR	FSCC	1B.2	Jun – August	Sandy areas and sagebrush scrub east of Sierra Nevada from 6,600 to 8,300 feet.	May potentially occur in appropriate habitat.

Scientific/Common Name	Federal/ State Status	Inyo National Forest Status	California Rare Plant Rank (CRPR)	Blooming Period/Fertile	Habitat	Likelihood for Occurrence
Astragalus lemmonii Lemmon's milk-vetch	—	FSCC	1B.2	May – August	Great Basin scrub, meadows and seeps, marshes and swamps (lake shores) from 3,300 to 7,220 feet.	May potentially occur in appropriate habitat.
Astragalus monoensis Mono milk-vetch	SR	FSCC	1B.2	June – August	Endemic to Mono County. Open areas, pumice flats in ashy to sandy soil or gravel with sparse vegetation. East of Sierra Nevada from 6,900 to 11,000 feet.	May potentially occur in appropriate habitat.
Astragalus serenoi var. *shockleyi* Shockley's milk-vetch	—	FSCC	2B.2	May – July	Found on alkaline or granitic alluvium within Great Basin scrub or pinyon-juniper woodland habitats from 5,000 to 7,800 feet.	May potentially occur in appropriate habitat.
Boechera bodiensis Bodie Hills rockcress	—	FSCC	1B.3	June – July	Alpine boulder and rock field, Great Basin scrub, pinyon and juniper woodland, and subalpine coniferous forest from 6,840 to 11,580 feet.	May potentially occur in appropriate habitat.
Boechera cobrensis masonic rockcress	—	—	2B.3	June – July	Sandy soils in Great Basin scrub and pinyon and juniper woodland from 4,510 to 10,185 feet.	May potentially occur in appropriate habitat.
Boechera tularensis Tulare rockcress	—	FSCC	1B.3	June – July	Rocky slopes in montane, subalpine habitats in the high Sierra Nevada from 5,900 to 11,000 feet.	May potentially occur in appropriate habitat.
Botrychium ascendens upswept moonwort	—	FSCC	2B.3	July – August (spores)	Grows in lower montane coniferous forest, meadows, and seeps from 4,900 to 7,500 feet.	May potentially occur in appropriate habitat.
Botrychium crenulatum scalloped moonwort	—	FSCC	2B.2	June – September (spores)	Meadows, marshes, bogs, and fens in lower and upper montane conifer forest from 4,100 to 10,800 feet.	May potentially occur in appropriate habitat.
Botrychium lineare slender moonwort	—	FSCC	1B.1	Unknown	Meadows and seeps, subalpine coniferous forest, upper montane coniferous forest (often in disturbed areas) from 8,395 to 8,530 feet.	May potentially occur in appropriate habitat.
Botrychium neolunaria common moonwort	—	—	2B.3	August (spores)	Meadows and seeps, moist riparian areas, subalpine coniferous forest and upper montane coniferous forest from 6,400 to 11,200 feet.	May potentially occur in appropriate habitat.
Botrychium paradoxum paradox moonwort	—	—	2B.1	August (spores)	Moist meadows, shrubby slopes from 5,800 to 13,000 feet.	May potentially occur in appropriate habitat.
Bruchia bolanderi Bolander's bruchia	—	FSCC	4.2	N/A	Meadows and seeps with damp soil within montane coniferous forest from 5,500 to 9,200 feet.	May potentially occur in appropriate habitat.
Calyptridium pygmaeum pygmy pussypaws	—	FSCC	1B.2	June – August	Subalpine coniferous forest and upper montane coniferous forest from 6,495 to 10,205 feet.	May potentially occur in appropriate habitat.
Carex davyi Davy's sedge	—	FSCC	1B.3	May – August	Dry meadows and slopes in subalpine coniferous forest and upper montane coniferous forest from 4,900 to 10,500 feet.	May potentially occur in appropriate habitat.
Carex idahoa Idaho sedge	—	FSCC	2B.3	July	Meadows and seeps and subalpine coniferous forest from 9,500 to 10,700 feet.	May potentially occur in appropriate habitat.

Scientific/Common Name	Federal/ State Status	Inyo National Forest Status	California Rare Plant Rank (CRPR)	Blooming Period/Fertile	Habitat	Likelihood for Occurrence
Carex petasata Liddon's sedge	—	FSCC	2B.3	May – July	Dry to wet meadows from 1,900 to 10,900 feet.	May potentially occur in appropriate habitat.
Carex praticola northern meadow sedge	—	FSCC	2B.2	May – July	Meadows and seeps up to 10,500 feet.	May potentially occur in appropriate habitat.
Carex scirpoidea ssp. *pseudoscirpoidea* western single-spiked sedge	—	FSCC	2B.2	July – September	Rocky, occasionally limey seasonally wet places in subalpine forest and alpine fell-fields from 6,800 to 12,200 feet.	May potentially occur in appropriate habitat.
Carex stevenii Steven's sedge	—	FSCC	2B.2	August	Along creeks or dry meadows within alpine boulder and rock fields from 9,500 to 11,300 feet.	May potentially occur in appropriate habitat.
Carex vallicola western valley sedge	—	FSCC	2B.3	July – August	Dry to moist montane slopes from 5,000 to 9,200 feet.	May potentially occur in appropriate habitat.
Cinna bolanderi Bolander's woodreed	—	—	1B.2	July – September	Mesic streamsides in meadows and seeps and upper montane coniferous forest from 5,500 to 8,200 feet.	May potentially occur in appropriate habitat.
Cusickiella (=Draba) quadricostata Bodie Hills cusickiella	—	—	1B.2	May – July	Sagebrush scrub and pinyon-juniper woodland from 6,700 to 9,300 feet.	May potentially occur in appropriate habitat.
Claytonia megarhiza fell-fields claytonia	—	FSCC	2B.3	July – September	Gravel, talus, and rocky crevices in lodgepole forest, subalpine forest, and alpine fell-fields from 8,500 to 12,600 feet.	**Known to occur within 1 mile of the FERC Project boundary**. There is an occurrence approximately 0.6 mile southwest of Waugh Lake (CNDDB 2023).
Cymopterus globosus globose cymoptera	—	FSCC	2B.2	March – June	Sandy substrates and open flats within Great Basin scrub habitats from 4,000 to 7,200 feet.	May potentially occur in appropriate habitat.
Dermatocarpon meiophyllizum silverskin lichen	—	—	2B.3	N/A	Aquatic to semi-aquatic, within the splash zone of lakes or streams. Preferred habitat is undisturbed, exposed streams with large rocks or bedrock at high elevations and cold, deep canyons at lower elevations. Found in coastal prairie, lower and upper montane coniferous forest, North Coast coniferous forest, and subalpine conifer forest from 970 to 11,465 feet.	May potentially occur in appropriate habitat.
Draba asterophora var. *asterophora* Tahoe draba	—	—	1B.2	July – August	Decomposed granite, open talus slopes, rock outcrops and crevices in subalpine coniferous woodland and alpine rock fields from 8,200 to 11,500 feet.	May potentially occur in appropriate habitat.
Draba cana canescent draba	—	—	2B.3	July	Rock crevices and outcrops in subalpine to alpine meadows from 8,000 to 13,000 feet.	May potentially occur in appropriate habitat.
Draba cruciata Mineral King draba	—	—	1B.3	June – August	Gravelly substrates in subalpine coniferous forest from 8,200 to 10,875 feet.	May potentially occur in appropriate habitat.
Draba incrassata Sweetwater Mountains draba	—	—	1B.3	July – August	Alpine boulder and rock field from 8,200 to 13,010 feet.	May potentially occur in appropriate habitat.

Scientific/Common Name	Federal/ State Status	Inyo National Forest Status	California Rare Plant Rank (CRPR)	Blooming Period/Fertile	Habitat	Likelihood for Occurrence
Draba praealta tall draba	—	—	2B.3	July – August	Wetlands, streambanks, or riparian areas in montane or subalpine moist meadows, forests, or cliffs in the high Sierra Nevada from 8,200 to 11,200 feet.	May potentially occur in appropriate habitat.
Dryopteris filix-mas male fern	—	FSCC	2B.3	July – September	Rocky and granitic substrates within upper montane coniferous forest habitats from 6,100 to 10,400 feet.	May potentially occur in appropriate habitat.
Elodium (=Helodium) blandowii Blandow's bog moss	—	FSCC	2B.2	N/A	Grows in wet meadows, fens, and seeps in subalpine coniferous forest and alpine lakes from 6,100 to 9,000 feet.	May potentially occur in appropriate habitat.
Erigeron aequifolius Hall's daisy	—	—	1B.3	June – August	Broadleafed upland forest, lower montane coniferous forest, pinyon and juniper woodland, upper montane coniferous forest from 4,920 to 8,005 feet.	May potentially occur in appropriate habitat.
Erigeron uncialis var. *uncialis* limestone daisy	—	FSCC	1B.2	May – July	Great Basin scrub, pinyon and juniper woodland, and subalpine coniferous forest from 6,230 to 9,515 feet.	May potentially occur in appropriate habitat.
Eriogonum mensicola Pinyon Mesa buckwheat	—	FSCC	1B.3	July – September	Rocky or gravelly substrates within Great Basin scrub, pinyon-juniper woodland, or upper montane coniferous forest habitats from 6,000 to 9,400 feet.	May potentially occur in appropriate habitat.
Eriogonum nutans var. *nutans* nodding buckwheat	—	—	2B.3	May – September	Sagebrush scrub, northern juniper woodland, chenopod scrub, and Great Basin scrub from 4,000 to 10,000 feet.	May potentially occur in appropriate habitat.
Festuca minutiflora small-flowered fescue	—	—	2B.3	July	Moist, shady banks in subalpine forest, bristlecone pine forest, and alpine fell-fields from 9,000 to 13,300 feet.	May potentially occur in appropriate habitat. There is an occurrence approximately 4.2 miles north from the Project Area (CNDDB 2023).
Hackelia brevicula Poison Canyon stickseed	—	FSCC	3.3	July – August	Dry creek bottoms and openings (often rocky) within broadleaf upland forest, Great Basin scrub, and subalpine coniferous forest habitats from 8,600 to 10,700 feet.	May potentially occur in appropriate habitat.
Helodium blandowii Blandow's bog moss	—	FSCC	2B.3	N/A	Grows in wet meadows, fens, and seeps in subalpine coniferous forest and alpine lakes from 6,100 to 9,000 feet.	May potentially occur in appropriate habitat.
Hulsea brevifolia short-leaved hulsea	—	FSCC	1B.2	May – August	Granitic or volcanic soils in openings and under canopy in mixed conifer and red fir forest from 4,500 to 10,500 feet.	May potentially occur in appropriate habitat.
Hulsea vestita ssp. *inyoensis* Inyo hulsea	—	FSCC	2B.2	April – June	Rocky soils in chenopod scrub, Great Basin scrub, and pinyon and juniper woodland from 5,400 to 10,000 feet.	May potentially occur in appropriate habitat.
Jamesia americana var. *rosea* fivepetal (rosy-petalled) cliffbush	—	FSCC	4.3	May – September	Granitic or carbonate rocky soils in alpine boulder and rock field, Great Basin scrub, pinyon and juniper woodland, and subalpine coniferous forest from 6,600 to 12,400 feet.	May potentially occur in appropriate habitat.

Scientific/Common Name	Federal/ State Status	Inyo National Forest Status	California Rare Plant Rank (CRPR)	Blooming Period/Fertile	Habitat	Likelihood for Occurrence
Kobresia myosuroides (= bellardii) seep kobresia	—	FSCC	2B.2	August	Alpine boulder and rock field on mesic soils, carbonate meadows and seeps, and subalpine coniferous forest from 5,000 to 10,900 feet. Only known from Mono County in California.	May potentially occur in appropriate habitat.
Lupinus duranii Mono Lake lupine	—	FSCC	1B.2	May – August	Sparsely vegetated open pumice flats in loose sandy or gravelly soil in Great Basin scrub, subalpine coniferous, and upper montane coniferous forest from 6,500 to 9,900 feet.	May potentially occur in appropriate habitat.
Lupinus lepidus var. *culbertsonii* Hockett Meadows lupine	—	—	1B.3	July – August	Meadows and seeps, and mesic, rocky soils in upper montane coniferous forest from 8,005 to 9,845 feet.	May potentially occur in appropriate habitat.
Lupinus padre-crowleyi Father Crowley's lupine	SR	FSCC	1B.2	July – August	Decomposed granite soils in Great Basin scrub, riparian forest, riparian scrub, and upper montane coniferous forest from 7,215 to 13,125 feet.	May potentially occur in appropriate habitat.
Meesia longiseta long seta hump moss	—	—	2B.3	N/A	Moss found in bogs, fens, meadows and seeps in upper mountain coniferous forest from 5,700 to 10,000 feet.	May potentially occur in appropriate habitat.
Meesia uliginosa broad-nerved hump moss	—	—	2B.2	July – October (spores)	Grows in permanently wet, primarily spring-fed meadows and fens in montane to subalpine coniferous forest from 4,200 to 9,200 feet.	May potentially occur in appropriate habitat.
Mentzelia torreyi Torrey's blazing star	—	FSCC	2B.2	June – August	Great Basin scrub, Mojavean desert scrub, and pinyon and juniper woodland from 3,835 to 9,300 feet.	May potentially occur in appropriate habitat.
Monardella beneolens sweet-smelling monardella	—	FSCC	1B.3	June - September	Alpine boulder and rock field, subalpine coniferous forest, and upper montane coniferous forest from 8,120 to 11,485 feet.	May potentially occur in appropriate habitat.
Parnassia parviflora small-flowered grass-of-Parnassus	—	—	2B.2	August – September	Wetlands, riparian areas, and rocky seeps in the high Sierra Nevada from 6,300 to 9,500 feet.	May potentially occur in appropriate habitat.
Pedicularis crenulata scalloped-leaved lousewort	—	—	2B.2	June – July	Meadows and seeps, and wetland-riparian areas from 7,000 to 7,700 feet.	May potentially occur in appropriate habitat.
Petrophytum (=Petrophyton) caespitosum ssp. *acuminatum* marble rockmat	—	FSCC	1B.3	August – September	Rocky crevices in lower montane coniferous forest and upper montane coniferous forest from 3,330 to 7,545 feet.	May potentially occur in appropriate habitat.
Phacelia monoensis Mono County phacelia	—	FSCC	1B.1	May – July	Great Basin scrub and pinyon and juniper woodland from 6,230 to 9,515 feet.	May potentially occur in appropriate habitat.
Physaria ludoviciana silver bladderpod	—	FSCC	2B.2	May – June	Great Basin scrub habitats.	May potentially occur in appropriate habitat.
Pohlia tundrae tundra thread moss	—	—	2B.3	N/A	Alpine meadows and seeps from 8,888 to 9,900 feet.	May potentially occur in appropriate habitat.

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Polyctenium williamsiae Williams' combleaf	—	FSCC	1B.2	March – July	Great Basin scrub, marshes and swamps, pinyon and juniper woodland, playas, and vernal pools from 4,415 to 8,860 feet.	May potentially occur in appropriate habitat.
Potamogeton praelongus white-stemmed pondweed	—	—	2B.3	July – August	Deep water in lakes, marshes, and swamps from 6,000 to 10,000 feet.	May potentially occur in appropriate habitat.
Potamogeton robbinsii Robbins' pondweed	—	—	2B.3	July – August	Shallow to deep water of ponds, lakes, and slow-flowing rivers from 5,000 to 10,900 feet.	May potentially occur in appropriate habitat.
Potentilla pulcherrima beautiful cinquefoil	—	FSCC	2B.2	July	Great basin scrub habitats.	May potentially occur in appropriate habitat.
Ranunculus hydrocharoides frog's-bit buttercup	—	FSCC	2B.1	June – September	Freshwater marshes and swamps and sinks, flats, and lake margins from 3,700 to 9,000 feet.	May potentially occur in appropriate habitat.
Sabulina stricta bog sandwort	—	—	2B.3	July – September	Granitic gravels, sandy wet spots, meadows and seeps, alpine areas from 8,000 to 13,000 feet.	**Known to occur within 1 mile of the FERC Project boundary.** There is an occurrence approximately 0.5 mile south of the Waugh Lake (CNDDB 2023).
Salix brachycarpa var. *brachycarpa* short-fruited willow	—	—	2B.3	June – August	Subalpine forest, alpine fell-fields, and wetland or riparian areas, especially on limestone, from 4,900 to 8,200 feet.	May potentially occur in appropriate habitat.
Sclerocactus polyancistrus redspined fishhook cactus	—	FSCC	4.2	April – July	Carbonate soils in Great Basin scrub, Joshua tree woodland, and Mojave desert scrub from 2,100 to 7,800 feet.	May potentially occur in appropriate habitat.
Silene oregana Oregon campion	—	—	2B.2	July – September	Sagebrush scrub and subalpine conifer forest from 4,900 to 8,200 feet.	May potentially occur in appropriate habitat.
Solorina spongiosa fringed chocolate chip lichen	—	FSCC	2B.2	N/A	Carbonate moss mats in meadows and seeps in subalpine coniferous forest.	May potentially occur in appropriate habitat.
Sphaeromeria potentilloides var. *nitrophila* fivefinger chickensage (alkali tansy-sage)	—	FSCC	2B.2	June – July	Alkaline soils in meadows and seeps and playas from 7,000 to 8,000 feet.	May potentially occur in appropriate habitat.
Tetradymia tetrameres dune horsebrush	—	FSCC	2B.2	August	Sandy soils in Great Basin scrub from 4,000 to 7,200 feet.	May potentially occur in appropriate habitat.
Thelypodium integrifolium ssp. *complanatum* foxtail thelypodium	—	FSCC	2B.2	June – October	Alkaline or subalkaline, mesic soils in Great Basin scrub and meadows and seeps from 3,600 to 8,400 feet.	May potentially occur in appropriate habitat.
Thelypodium milleflorum many-flowered theylopodium	—	FSCC	2B.2	April – June	Chenopod scrub and sandy soils in Great Basin scrub from 4,000 to 8,400 feet.	May potentially occur in appropriate habitat.
Trichophorum pumilum little bulrush	—	FSCC	2B.2	August	Riverbanks and carbonate soils in bogs and fens, marshes and swamps, and riparian scrub from 9,500 to 10,900 feet.	May potentially occur in appropriate habitat.

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Trifolium bolanderi Bolander's clover	—	—	1B.2	June – August	Mesic soils in meadows and seeps and lower and upper montane coniferous forest from 6,700 to 8,700 feet.	May potentially occur in appropriate habitat.
Trifolium dedeckerae (= kingii ssp. *dedeckerae)* Dedecker's clover	—	FSCC	1B.3	May – July	Granitic, rocky soils in pinyon and juniper woodland, lower and upper montane coniferous forest, and subalpine coniferous forest from 7,000 to 11,700 feet.	May potentially occur in appropriate habitat.
Triglochin palustris marsh arrow-grass	—	—	2B.3	July – August	Meadows and seeps, freshwater marshes and swamps, and subalpine coniferous forest from 7,495 to 12,140 feet.	May potentially occur in appropriate habitat.
Viola pinetorum ssp. *grisea* gray-leaved violet	—	—	1B.2	April – July	Meadows and seeps, subalpine coniferous forest, and upper montane coniferous forest from 5,000 to 11,400 feet.	May potentially occur in appropriate habitat.
Viola purpurea ssp. *aurea* golden violet	—	FSCC	2B.2	April – June	Sandy slopes in sagebrush scrub and pinyon-juniper woodland from 3,200 to 8,200 feet.	May potentially occur in appropriate habitat.
Unlikely to Occur in the FERC Project Boundary or Within 1 Mile of the Boundary						
Abronia alpina alpine sand verbena (Ramshaw Meadows abronia)	—	FSCC	1B.1	July – August	Meadows and seeps (granitic, gravelly margins) from 7,870 to 8,860 feet. Only known from the Ramshaw Meadows area of the Kern Plateau.	Unlikely to occur. The Project is outside the geographic range of the species.
Allium atrorubens var. *atrorubens* Great Basin onion	—	FSCC	2B.3	May – June	Sagebrush scrub and pinyon-juniper woodland from 4,000 to 7,000 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Astragalus cimae var. *sufflatus* inflated milk-vetch	—	FSCC	1B.3	April – June	Great Basin scrub, pinyon and juniper woodland from 4,920 to 6,810 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Astragalus inyoensis Inyo milk-vetch	—	FSCC	4.2	May – June	Pinyon-juniper woodland from 5,000 to 8,900 feet.	Unlikely to occur. The Project vicinity does not support pinyon-juniper woodland habitat.
Astragalus kentrophyta var. *elatus* spiny-leaved milk-vetch	—	FSCC	2B.2	June – September	Subalpine forest from 9,600 to 10,700 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Astragalus lentiginosus var. *kernensis* Kern Plateau milk-vetch	—	FSCC	1B.2	June – July	Meadows and seeps, subalpine coniferous forest from 7,345 to 9,020 feet. Only known from the Kern Plateau and vicinity.	Unlikely to occur. The Project is outside the geographic range of the species.
Astragalus ravenii Raven's milk-vetch	—	FSCC	1B.3	July – September	Alpine boulder and rock field, upper montane coniferous forest from 11,005 to 11,350 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Astragalus subvestitus Kern County milk-vetch	—	FSCC	4.3	June – July	Found on sandy or gravelly substrates within meadows, Great Basin scrub, or pinyon-juniper woodland habitats from 7,700 to 9,200 feet. Only known from the Kern Plateau region on the Inyo National Forest.	Unlikely to occur. The Project is outside the geographic range of the species.
Atriplex pusilla smooth saltbush	—	—	2B.1	June – September	Found on alkali soils in Great Basin scrub, meadows and seeps near hot springs from 4,300 to 6,700 feet.	Unlikely to occur. The Project is outside the elevational range of the species.

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Boechera pendulina rabbit-ear rockcress	—	FSCC	2B.1	April – June	Gravelly or rocky soils within Great Basin scrub or pinyon-juniper woodland habitats from 10,100 to 10,700 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Boechera pinzliae Pinzl's rockcress	—	FSCC	1B.3	July	Gravelly granitic soil in alpine and subalpine areas in the White and Inyo Mountains from 9,800 to 11,200 feet.	Unlikely to occur. The Project is outside the elevational and geographic range of the species.
Boechera shockleyi Shockley's rockcress	—	FSCC	2B.2	May – June	Carbonate or quartzite, rocky or gravelly soils in pinyon and juniper woodland from 2,870 to 7,580 feet. Only known from the White and Inyo Mountains.	Unlikely to occur. The Project is outside the geographic range of the species.
Boechera (=*Arabis*) *tiehmii* Tiehm's rockcress	—	FSCC	1B.3	July – August	Rock outcrops, gravelly soil on windswept rocky ridges and in crevices in the high Sierra Nevada from 9,800 to 11,800 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Botrychium minganense Mingan moonwort	—	FSCC	4.2	July – September (spores)	Meadows, marshes, bogs, and fens in lower and upper montane conifer forest from 4,500 to 7,000 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Botrychium tunux moosewort	—	—	2B.1	August – September (spores)	Alpine boulder and rock field at approximately 10,005 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Botrychium yaaxudakeit giant moonwort	—	—	2B.1	August (spores)	Alpine boulder and rock field (meadows) at approximately 10,500 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Calochortus excavatus Inyo County star-tulip	—	FSCC	1B.1	April – July	Chenopod scrub, meadows and seeps from 3,770 to 6,560 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Carex duriuscula spikerush sedge	—	FSCC	2B.3	July – August	Great Basin scrub and subalpine coniferous forest from 11,600 to 13,700 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Carex tiogana Tioga Pass sedge	—	FSCC	1B.3	July – August	Coarse, wet, limey soil; subalpine to alpine meadows, seeps, and lake margins from 9,800 to 11,000 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Chaetadelpha wheeleri Wheeler’s dune-broom	—	FSCC	2B.2	April – September	Sandy substrates within dunes, Great Basin scrub, or Mojavean desert habitats from 2,650 to 6,400 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Cladium californicum California sawgrass	—	—	2B.2	June – September	Meadows and seeps, marshes and swamps alkaline or freshwater from 195 to 5,250 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Cordylanthus eremicus ssp. *kernensis* Kern Plateau bird's beak	—	FSCC	1B.3	July – September	Great Basin scrub, Joshua tree woodland, pinyon and juniper woodland, upper montane coniferous forest from 5,495 to 9,845 feet. Only known from the Kern Plateau and vicinity.	Unlikely to occur. The Project is outside the geographic range of the species.
Crepis runcinata ssp. *hallii* Hall’s meadow hawksbeard	—	FSCC	—	May – July	Mesic areas with alkaline soils within Mojavean desert or pinyon-juniper woodland habitats from 4,200 to 4,900 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Cryptantha incana Tulare cyptantha	—	—	1B.3	June – August	Gravelly or rocky soils in lower montane coniferous forest from 4,690 to 7,055 feet.	Unlikely to occur. The Project is outside the elevational range of the species.

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Cuniculotinus (=Chrysothamnus) gramineus Panamint rock-goldenrod	—	FSCC	2B.3	June – August	Carbonate or rocky substrates within pinyon-juniper woodlands and subalpine coniferous forest habitats from 6,800 to 9,700 feet. Only known from the Inyo and Panamint mountains.	Unlikely to occur. The Project is outside the geographic range of the species.
Dedeckera eurekensis July gold	SR	FSCC	1B.3	May – August	Carbonate substrates in Mojave and desert scrub from 3,985 to 7,220 feet	Unlikely to occur. No appropriate habitat is present in the Project vicinity.
Draba californica California draba	—	FSCC	4.2	July – August	Meadows and seeps within alpine boulder and rock fields from 10,000 to 14,000 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Draba monoensis White Mountains draba	—	FSCC	1B.2	August	Alpine boulder and rock field, meadows and seeps from 9,840 to 12,990 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Draba sharsmithii Mt. Whitney draba	—	FSCC	1B.3	July – August	Alpine boulder and rock field, subalpine coniferous forest from 10,825 to 12,990 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Elymus scribneri Scribner's wheat grass	—	—	2B.3	July – August	Alpine boulder and rock fields from 9,510 to 13,780 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Eremothera boothii ssp. *boothii* Booth's evening-primrose	—	—	2B.3	April – September	Sandy flats and slopes in Joshua tree and pinyon/juniper woodland from 2,600 to 7,900 feet.	Unlikely to occur. No appropriate habitat is present in the Project vicinity.
Eremothera boothii ssp. *intermedia* Booth's hairy evening-primrose	—	—	2B.3	June	Sandy soils in sagebrush scrub from 4,900 to 7,054 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Ericameria gilmanii Gilman's goldenbush	—	FSCC	1B.3	August – September	Subalpine coniferous forest, upper montane coniferous forest from 6,885 to 11,155 feet. Only known from a single population in the White Mountains on the Inyo National Forest.	Unlikely to occur. The Project is outside the geographic range of the species.
Erigeron compactus compact daisy	—	FSCC	2B.3	May – July	Rocky or gravelly substrates within pinyon-juniper woodland habitats from 4,300 to 9,700 feet.	Unlikely to occur. No appropriate habitat is present in the Project vicinity.
Erigeron multiceps Kern River daisy	—	—	1B.2	June – September	Meadows and seeps, and openings in upper montane coniferous forest from 4,920 to 8,315 feet. Known only from the Kern Plateau.	Unlikely to occur. The Project is outside the geographic range of the species.
Eriogonum alexanderae (=Eriogonum ochrocephalum var. ochrocephalum) Alexander's buckwheat	—	FSCC	1B.1	May – July	Shale or gravelly substrates within Great Basin scrub or pinyon-juniper woodland habitats. Known only between Potato Peak and Bodie Mountain.	Unlikely to occur. The Project is outside the geographic range of the species.
Eriogonum wrightii var. *olanchense* Olancha Peak buckwheat	—	FSCC	1B.3	July – September	Alpine boulder and rock field and gravelly, rocky areas in subalpine coniferous forest from 10,695 to 11,600 feet	Unlikely to occur. The Project is outside the elevational range of the species.
Erythranthe utahensis Utah monkeyflower	—	—	2B.1	April	Meadows and seeps, pinyon and juniper woodland from 2,000 to 6,560 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Goodmania luteola yellow spinecape	—	FSCC	4.2	April – August	Alkaline or clay substrates within meadows, seeps, or playas within Mojavean desert scrub or valley/foothill grassland habitats from 70 to 7,400 feet.	Unlikely to occur. No appropriate habitat is present in the Project vicinity.

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Greeneocharis (=Cryptantha) circumscissa var. *rosulata* Rosetta cushion cryptantha	—	FSCC	1B.2	July – August	Alpine boulder and rock field, subalpine coniferous forest from 9,675 to 12,010 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Grusonia pulchella beautiful cholla	—	FSCC	2B.2	May	Sandy substrates within desert dunes, Great Basin scrub, or Mojavean desert scrub habitats from 5,000 to 6,600 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Hackelia sharsmithii Sharsmith's stickseed	—	FSCC	2B.3	July – September	Granitic or rocky substrates within alpine boulder/rock fields or subalpine coniferous forest habitats from 10,000 to 12,400 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Hesperidanthus jaegeri Jaeger's hesperidanthus	—	FSCC	1B.2	May – July	Great Basin scrub, pinyon and juniper woodland, and subalpine coniferous forest from 7,000 to 9,185 feet. Known only from the Inyo Mountains.	Unlikely to occur. The Project is outside the geographic range of the species.
Hordeum intercedens vernal barley	—	—	3.2	March – June	Coastal dunes, Coastal scrub, valley and foothill grassland (saline flats and depressions), vernal pools from 15 to 3,280 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Horkelia hispidula White Mountains horkelia	—	FSCC	1B.3	June – August	Alpine dwarf scrub, Great Basin scrub, and subalpine coniferous forest from 9,840 to 11,155 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Ivesia campestris field ivesia	—	FSCC	1B.2	May – August	Edges of meadows and seeps, subalpine coniferous forest, and upper montane coniferous forest from 6,500 to 11,400 feet. Endemic to the Kern Plateau.	Unlikely to occur. The Project is outside the geographic range of the species.
Ivesia kingii var. *kingii* alkali ivesia	—	FSCC	2B.2	May – August	Mesic, alkaline, or clay soils in Great Basin scrub, meadows and seeps, and playas from 4,000 to 7,100 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Ladeania lanceolata (=Psoralidium lanceolatum) lanceleaved scurf-pea	—	FSCC	2B.3	April – August	Sandy soils in Great Basin scrub from 4,000 to 8,400 feet. Only known east of Highway 395 in Mono County.	Unlikely to occur. The Project is outside the geographic range of the species.
Lomatium foeniculaceum ssp. *inyoense* Inyo biscuitroot	—	FSCC	4.3	June – July	Carbonate soils in subalpine coniferous forest from 7,300 to 10,700 feet. Only known from the White and Inyo Mountains in California.	Unlikely to occur. The Project is outside the geographic range of the species.
Lupinus gracilentus slender lupine	—	—	1B.3	July – August	Subalpine coniferous forest from 6,000 to 11,500 feet. Currently known only from the Yosemite Valley.	Unlikely to occur. The Project is outside the geographic range of the species.
Mentzelia inyoensis Inyo blazing star	—	FSCC	1B.1	April – October	Rocky, carbonate soils in Great Basin scrub and pinyon and juniper woodland from 3,795 to 6,495 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Oreocarya (=*Cryptantha*) *roosiorum* bristlecone cryptantha	SR	FSCC	1B.2	June – July	Carbonate, rocky soils in subalpine coniferous forest from 8,005 to 10,595 feet. Only known from the Inyo Mountains.	Unlikely to occur. The Project is outside the geographic range of the species.
Oxytropis deflexa var. *sericea* blue pendant-pod oxytrope	—	FSCC	2B.1	June – August	Meadows and seeps and upper montane coniferous forest from 9,300 to 11,200 feet. Known only from the White Mountains.	Unlikely to occur. The Project is outside the geographic range of the species.

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Penstemon calcareus limestone beardtongue	—	FSCC	1B.3	April – May	Carbonate and rocky soils in Joshua tree woodland, Mojave desert scrub, and pinyon and juniper woodland from 3,500 to 6,800 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Phacelia inyoensis Inyo phacelia	—	FSCC	1B.2	April – August	Alkaline meadow margins and desert scrub seeps from 3,000 to 10,500 feet.	Unlikely to occur. No appropriate habitat is present in the Project vicinity.
Phacelia nashiana Charlotte's phacelia	—	FSCC	1B.2	March – June	Granitic, sandy soils in Joshua tree woodland, Mojave desert scrub, and pinyon and juniper woodland from 2,000 to 7,400 feet in elevation.	Unlikely to occur. No appropriate habitat is present in the Project vicinity.
Physocarpus alternans Nevada ninebark	—	FSCC	2B.3	June – July	Rocky carbonate soils in pinyon and juniper woodland from 6,000 to 10,400 feet.	Unlikely to occur. No appropriate habitat is present in the Project vicinity.
Plagiobothrys parishii Parish's popcornflower	—	FSCC	1B.1	March – June	Alkaline or mesic soils in Great Basin scrub and Joshua tree woodland from 2,460 to 4,595 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Polemonium chartaceum Mason's sky pilot	—	FSCC	1B.3	June – August	Alpine boulder and rock field, subalpine coniferous forest from 10,790 to 14,010 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Populus angustifolia narrow-leaved cottonwood	—	FSCC	2B.2	March – April	Riparian forests on the east slope of the Sierras and other mountain ranges from 4,000 to 6,000 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Potentilla morefieldii Morefield's cinquefoil	—	FSCC	1B.3	July – September	Carbonate substrates in alpine boulder and rock field from 10,710 to 13,125 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Puccinellia simplex California alkali grass	—	—	1B.2	March – May	Alkaline, vernally mesic areas in chenopod scrub, meadows and seeps, valley and foothill grassland, and vernal pools from 5 to 3,050 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Salix nivalis snow willow	—	—	2B.3	June – July	Alpine cirques from 10,000 to 11,500 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Sibaropsis hammittii Hammitt's clay-cress	—	—	1B.2	March – April	Openings in chaparral and valley and foothill grassland from 2,360 to 3,495 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Sphenopholis obtusata prairie wedge grass	—	FSCC	2B.2	April – July	Mesic soils in cismontane woodland and meadows and seeps from 1,000 to 6,700 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Stipa divaricata small-flowered ricegrass	—	FSCC	2B.3	June – September	Gravelly or carbonate soils in pinyon and juniper woodland from 2,300 to 9,900 feet.	Unlikely to occur. No appropriate habitat is present in the Project vicinity.
Strepthantus gracilis alpine jewelflower	—	FSCC	1B.3	July – August	Granitic, rocky soils in subalpine coniferous forest and upper montane coniferous forest from 9,300 to 11,700 feet. Only known from the Kings-Kern Divide at the intersection of Tulare, Fresno, and Inyo counties.	Unlikely to occur. The Project is outside the geographic range of the species.
Streptanthus howellii Howell's jewelflower	—	—	1B.2	July – August	Serpentinite and rocky soils in lower montane coniferous forest from 1,000 to 4,920 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Streptanthus oliganthus masonic mountain jewelflower	—	FSCC	1B.2	June – July	Volcanic or granitic soils in pinyon-juniper woodland from 6,600 to 10,200 feet.	Unlikely to occur. No appropriate habitat is present in the Project vicinity.

Scientific/Common Name	Federal/ State Status	Inyo National Forest Status	California Rare Plant Rank (CRPR)	Blooming Period/Fertile	Habitat	Likelihood for Occurrence
Stuckenia filiformis ssp. *alpina* slender-leaved pondweed	—	—	2B.2	May – July	Shallow, clear water of freshwater wetlands, lakes, and drainage channels from 900 to 7,100 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Stylocline masonii Mason's neststraw	—	—	1B.1	March – May	Sandy soils in chenopod scrub and pinyon and juniper woodland from 325 to 3,935 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Taraxacum ceratophorum horned dandelion	—	FSCC	2B.1	June – July	Carbonate soils in alpine boulder and rock fields, meadows and seeps, and mesic valley and foot hill grassland from 9,600 to 12,100 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Townsendia leptotes slender townsendia	—	FSCC	2B.3	June – August	Alpine boulder and rock fields from 10,900 to 12,700 feet.	Unlikely to occur. The Project is outside the elevational range of the species.
Transberingia bursifolia ssp. *virgata (=Halimolobos virgata)* virgate halimolobos	—	FSCC	2B.3	July	Meadows and seeps and pinyon and juniper woodland from 6,600 to 10,000 feet. Known only from the Inyo and White mountains.	Unlikely to occur. The Project is outside the geographic range of the species.

Sources: CNDDB 2020, SCE 2018, SCE 2020

LEGEND:

Federal Status
FC = Candidate Species
FE = Federal Endangered
FT = Federal Threatened

Inyo National Forest Status
FSCC = Inyo National Forest Service Species of Conservation Concern

State Status
SR = California Rare
ST = California Threatened
SE = California Endangered

CRPR = California Native Plant Society Rare Plant Rank
1B = rare, threatened or endangered in California and elsewhere
2B = rare in California but more common elsewhere
3 = need more information
4 = plants of limited distribution, a watch list
_.1 = Seriously threatened in California (over 80% of occurrences threatened/high degree and immediacy of threat)
_.2 = Moderately threatened in California (20 – 80% of occurrences threatened)
_.3 = Not very threatened in California (less than 20% of occurrences threatened or no current threats known)

Sources:

1. CNDDB (California Natural Diversity Database). 2023. Rarefind, Version 5.0. Online Database. Accessed November 28, 2023.
2. E. Read and Associates, Inc. 2023. Analysis of Riparian Vegetation: 2022 Field Season and Comparison to Previous Years. Rush Creek (FERC No. 1389). Final Report, April 25, 2023.
3. SCE. 2018. Pre-Construction Survey Report. Rush Meadows Dam Modification, Rush Creek Hydroelectric System Runoff Management Project. July.
4. SCE. 2020. Biological Resources Technical Report. Gem Lake Dam Arch 8 Valve Replacement Project. April.

APPENDIX E

Comprehensive List of Plant Species Identified within the Project Area

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Appendix E. Comprehensive List of Plant Species Identified within the Study Area.

Scientific Name	Common Name	Native/Non-Native	Family	Treatment Strategy Level[1]	Status
Special Status Species					
Pinus albicaulis	Whitebark pine	Native	Pinaceae	-	Federal Threatened
Agrostis humilis[2]	Mountain bentgrass	Native	Poaceae	-	California Rare Plant Rank 1B.2
Non-Native Invasive Plant Species					
Bromus tectorum	Cheatgrass	Non-native	Poaceae	Group 3	-
Centaurea stoebe	Spotted knapweed	Non-native	Asteraceae	Group 1	-
Cirsium vulgare	Bull thistle	Non-native	Asteraceae	Group 3	-
Melilotus albus	White sweet clover	Non-native	Fabaceae	Group 3	-
Polygonum aviculare	Common knotgrass	Non-native	Polygonaceae	Group 4	-
Rumex crispus	Curly dock	Non-native	Polygonaceae	Group 4	-
Salsola tragus	Russian thistle (tumbleweed)	Non-native	Chenopodiaceae	Group 3	-
Saponaria officinalis	Soapwort	Non-native	Caryophyllaceae	Group 2	-
Spergularia rubra	Red sandspurry	Non-native	Caryophyllaceae	Group 4	-
Taraxacum officinale	Common dandelion	Non-native	Asteraceae	Group 4	-
Tragopogon dubius	Yellow salsify	Non-native	Asteraceae	Group 4	-
Trifolium repens	White clover	Non-native	Fabaceae	Group 4	-
Verbascum thapsus	Common mullein	Non-native	Scrophulariaceae	Group 4	-
All Other Plant Species					
Abies concolor	White fir	Native	Pinaceae	-	-
Achillea millefolium	Yarrow	Native	Asteraceae	-	-
Aconitum columbianum	Monkshood	Native	Ranunculaceae	-	-
Ageratina occidentalis	Western eupatorium	Native	Asteraceae	-	-
Agoseris glauca	Pale dandelion	Native	Asteraceae	-	-
Agoseris monticola	Mountain agoseris	Native	Asteraceae	-	-
Agrostis idahoensis	Idaho bentgrass	Native	Poaceae	-	-
Agrostis scabra	Rough bent grass	Native	Poaceae	-	-
Allium bisceptrum	Twincrest onion	Native	Alliaceae	-	-
Allium validum	Swamp onion	Native	Alliaceae	-	-
Ambrosia acanthicarpa	Annual bur-sage	Native	Asteraceae	-	-
Amelanchier utahensis	Utah service-berry	Native	Rosaceae	-	-
Anaphalis margaritacea	Pearly everlasting	Native	Asteraceae	-	-
Angelica capitellata	Ranger's Buttons	Native	Apiaceae	-	-
Angelica lineariloba	Poison angelica	Native	Apiaceae	-	-
Antennaria corymbosa	Flat top pussytoes	Native	Asteraceae	-	-
Antennaria media	Alpine pussytoes	Native	Asteraceae	-	-
Apocynum androsaemifolium	Bitter dogbane	Native	Apocynaceae	-	-
Aquilegia Formosa	Western columbine	Native	Ranunculaceae	-	-
Arctostaphylos nevadensis	Pine mat manzanita	Native	Ericaceae	-	-

Scientific Name	Common Name	Native/Non-Native	Family	Treatment Strategy Level[1]	Status
Arctostaphylos patula	Greenleaf manzanita	Native	Ericaceae	-	-
Argemone corymbosa	Leafy prickly poppy	Native	Papaveraceae	-	-
Arnica chamissonis	Chamisso arnica	Native	Asteraceae	-	-
Arnica nevadensis	Sierra arnica	Native	Asteraceae	-	-
Artemisia arbuscula	Low sagebrush	Native	Asteraceae	-	-
Artemisia cana	Silver sagebrush	Native	Asteraceae	-	-
Artemisia douglasiana	California mugwort	Native	Asteraceae	-	-
Artemisia dracunculus	Tarragon	Native	Asteraceae	-	-
Artemisia ludoviciana	Silver wormwood	Native	Asteraceae	-	-
Artemisia tridentata ssp. vaseyana	Mountain sagebrush	Native	Asteraceae	-	-
Aspidotis densa	Dense lace fern	Native	Pteridaceae	-	-
Athyrium distentifolium	Alpine lady fern	Native	Athyriaceae	-	-
Balsamorhiza sagittata	Arrow leaved balsamroot	Native	Asteraceae	-	-
Boechera depauperata	Soldier rockcress	Native	Brassicaceae	-	-
Boechera howellii	Howell's rockcress	Native	Brassicaceae	-	-
Boechera paupercula	Small-flowered rockcress	Native	Brassicaceae	-	-
Boechera platysperma	Pioneer rockcress	Native	Brassicaceae	-	-
Boechera rectissima	Bristly leaf rockcress	Native	Brassicaceae	-	-
Boechera retrofracta	Reflexed rockcress	Native	Brassicaceae	-	-
Bromus arenarius	Australian chess	Non-native	Poaceae	-	-
Bromus sitchensis var. marginatus	Mountain brome	Native	Poaceae	-	-
Calamagrostis canadensis	Bluejoint reed grass	Native	Poaceae	-	-
Calochortus leichtlinii	Leichtlin's mariposa lily	Native	Liliaceae	-	-
Calyptridium monospermum	One seeded pussypaws	Native	Montiaceae	-	-
Calyptridium umbellatum	Pussy paws	Native	Montiaceae	-	-
Cardamine breweri	Brewer's bitter cress	Native	Brassicaceae	-	-
Carex abrupta	Abrupt-beaked sedge	Native	Cyperaceae	-	-
Carex aquatilis var. aquatilis	Water sedge	Native	Cyperaceae	-	-
Carex athrostachya	Long-bracted sedge	Native	Cyperaceae	-	-
Carex aurea	Golden sedge	Native	Cyperaceae	-	-
Carex capitata	Capitate sedge	Native	Cyperaceae	-	-
Carex douglasii	Douglas' sedge	Native	Cyperaceae	-	-
Carex filifolia var. filifolia	Thread-leaved sedge	Native	Cyperaceae	-	-
Carex fracta	Fragile-sheathed sedge	Native	Cyperaceae	-	-
Carex heteroneura	Smooth-fruited sedge	Native	Cyperaceae	-	-
Carex lemmonii	Lemmon’s sedge	Native	Cyperaceae	-	-
Carex microptera	Small-winged sedge	Native	Cyperaceae	-	-
Carex pachystachya	Starry broomsedge	Native	Cyperaceae	-	-
Carex pellita	Woolly sedge	Native	Cyperaceae	-	-
Carex praegracilis	Black creeper	Native	Cyperaceae	-	-
Carex rossi	Ross' sedge	Native	Cyperaceae	-	-

Scientific Name	Common Name	Native/Non-Native	Family	Treatment Strategy Level[1]	Status
Carex subfusca	Pale broomsedge	Native	Cyperaceae	-	-
Carex utriculata	Southern beaked sedge	Native	Cyperaceae	-	-
Cassiope mertensiana	White heather	Native	Ericaceae	-	-
Castilleja applegatei	Wavy leaf paint brush	Native	Orobanchaceae	-	-
Castilleja applegatei ssp. disticha	Forked wavy leaf paintbrush	Native	Orobanchaceae	-	-
Castilleja applegatei ssp. pinetorum	Pine wavy leaf paintbrush	Native	Orobanchaceae	-	-
Castilleja lemmonii	Lemmon's paintbrush	Native	Orobanchaceae	-	-
Castilleja linariifolia	Desert paintbrush	Native	Orobanchaceae	-	-
Castilleja miniata ssp. miniata	Scarlet indian paintbrush	Native	Orobanchaceae	-	-
Castilleja tenuis	Hairy owl’s clover	Native	Orobanchaceae	-	-
Caulanthus glaucus	Glaucous caulanthus	Native	Brassicaceae	-	-
Ceanothus velutinus	Snowbrush	Native	Rhamnaceae	-	-
Centaurea stoebe	Spotted knapweed	Non-native	Asteraceae	-	-
Cercocarpus ledifolius	Curl-leaf mountain mahogany	Native	Rosaceae	-	-
Chaenactis douglasii	Chaenactis	Native	Asteraceae	-	-
Chamerion angustifolium	Fireweed	Native	Onagraceae	-	-
Chenopodium album	Lamb's quarters	Non-native	Chenopodiaceae	-	-
Chenopodium berlandieri	Pitseed goosefoot	Native	Chenopodiaceae	-	-
Chenopodium desiccatum	Dry goosefoot	Native	Chenopodiaceae	-	-
Chrysolepis sempervirens	Bush chinquapin	Native	Fagaceae	-	-
Cicuta douglasii	Western water hemlock	Native	Apiaceae	-	-
Cirsium andersonii	Anderson’s thistle	Native	Asteraceae	-	-
Cirsium scariosum	Meadow thistle	Native	Asteraceae	-	-
Claytonia nevadensis	Sierra spring beauty	Native	Montiaceae	-	-
Collinsia parviflora	Blue-eyed mary	Native	Plantaginaceae	-	-
Collinsia torreyi var. wrightii	Wright's blue eyed mary	Native	Plantaginaceae	-	-
Corallorhiza maculata	Spotted coralroot	Native	Orchidaceae	-	-
Cornus sericea	American dogwood	Native	Cornaceae	-	-
Cornus sericea ssp. sericea	Red osier dogwood	Native	Cornaceae	-	-
Coronilla varia	Crown vetch	Non-native	Fabaceae	-	-
Cratoneuron filicinum	Fern-leaved hook-moss	Native	Amblystegiaceae	-	-
Crepis acuminata	Long leaved hawk's beard	Native	Asteraceae	-	-
Cryptantha echinella	Hedgehog cryptantha	Native	Boraginaceae	-	-
Cryptantha torreyana	Torrey's cryptantha	Native	Boraginaceae	-	-
Cryptogramma acrostichoides	American parsely fern	Native	Pteridaceae	-	-
Cystopteris fragilis	Brittle fern	Native	Cystopteridaceae	-	-
Dactylis glomerata	Orchardgrass	Non-native	Poaceae	-	-
Danthonia unispicata	One spiked oatgrass	Native	Poaceae	-	-
Dasiphora fruticosa	Shrubby cinquefoil	Native	Rosaceae	-	-
Deschampsia cespitosa ssp. cespitosa	Tufted hairgrass	Native	Poaceae	-	-
Descurainia incana	Mountain tansy mustard	Native	Brassicaceae	-	-

Scientific Name	Common Name	Native/Non-Native	Family	Treatment Strategy Level[1]	Status
Descurainia incisa	Mountain tansy mustard	Native	Brassicaceae	-	-
Dieteria canescens var. canescens	Hoary aster	Native	Asteraceae	-	-
Drymocallis glandulosa	Sticky cinquefoil	Native	Rosaceae	-	-
Drymocallis lactea var. lactea	Sierran woodbeauty	Native	Rosaceae	-	-
Dysphania ambrosioides	Mexican tea	Native	Chenopodiaceae	-	-
Eleocharis macrostachya	Common spikerush	Native	Cyperaceae	-	-
Elymus elymoides	Squirreltail grass	Native	Poaceae	-	-
Elymus glaucus	Blue wildrye	Native	Poaceae	-	-
Elymus lanceolatus ssp. riparius	Northern wheatgrass	Native	Poaceae	-	-
Elymus multisetus	Big squirreltail grass	Native	Poaceae	-	-
Elymus repens	Quackgrass	Non-native	Poaceae	-	-
Elymus trachycaulus ssp. trachycaulus	Slender wheatgrass	Native	Poaceae	-	-
Epilobium ciliatum	Slender willow herb	Native	Onagraceae	-	-
Epilobium ciliatum ssp. ciliatum	Fringed willow herb	Native	Onagraceae	-	-
Epilobium minutum	Chaparral willowherb	Native	Onagraceae	-	-
Epipactis gigantea	Stream orchid	Native	Orchidaceae	-	-
Equisetum arvense	Common horsetail	Native	Equisetaceae	-	-
Equisetum hyemale ssp. affine	Common scouring rush	Native	Equisetaceae	-	-
Equisetum laevigatum	Smooth horsetail	Native	Equisetaceae	-	-
Eremogone kingii	King’s sandwort	Native	Caryophyllaceae	-	-
Eremogone kingii var. glabrescens	King's smooth sandwort	Native	Caryophyllaceae	-	-
Eriastrum diffusum	Miniature wooly star	Native	Polemoniaceae	-	-
Ericameria cuneata var. cuneata	Cliff goldenbush	Native	Asteraceae	-	-
Ericameria nauseosa	Rubber rabbitbrush	Native	Asteraceae	-	-
Ericameria suffruticosa	Heath goldenrod	Native	Asteracaea	-	-
Erigeron aphanactis var. aphanactis	Rayless shaggy fleaban	Native	Asteraceae	-	-
Erigeron canadensis	Canada horseweed	Native	Asteraceae	-	-
Erigeron compositus	Cut leaved daisy	Native	Asteraceae	-	-
Erigeron coulteri	Coulter's daisy	Native	Asteraceae	-	-
Erigeron glacialis var. hirsutus	Wandering fleabane	Native	Asteraceae	-	-
Eriogonum cernuum	Nodding buckwheat	Native	Polygonaceae	-	-
Eriogonum incanum	Frosted buckwheat	Native	Polygonaceae	-	-
Eriogonum nudum	Naked buckwheat	Native	Polygonaceae	-	-
Eriogonum ovalifolium var. nivale	Cushion buckwheat	Native	Polygonaceae	-	-
Eriogonum umbellatum var. nevadense	Sulfur buckwheat	Native	Polygonaceae	-	-
Eriogonum wrightii var. subscaposum	Wright's buckwheat	Native	Polygonaceae	-	-
Erysimum capitatum	Western wallflower	Native	Brassicaceae	-	-
Erythranthe breweri	Brewer's monkeyflower	Native	Phrymaceae	-	-
Erythranthe floribunda	Many-flowered monkeyflower	Native	Phrymaceae	-	-
Erythranthe guttata	Seep monkeyflower	Native	Phrymaceae	-	-
Erythranthe lewisii	Lewis' monkeyflower	Native	Phrymaceae	-	-

Scientific Name	Common Name	Native/Non-Native	Family	Treatment Strategy Level[1]	Status
Erythranthe primuloides	Primrose monkeyflower	Native	Phrymaceae	-	-
Erythranthe rubella	Red stemmed monkeyflower	Native	Phrymaceae	-	-
Euphorbia serpillifolia ssp. serpillifolia	Thyme-leafed spurge	Native	Euphorbiaceae	-	-
Festuca idahoensis	Blue bunchgrass	Native	Poaceae	-	-
Frangula rubra	Sierra coffee berry	Native	Rhamnaceae	-	-
Frangula rubra ssp. obtusissim	Obtuse buckthorn	Native	Rhamnaceae	-	-
Galium bifolium	Low mountain bedstraw	Native	Rubiaceae	-	-
Galium multiflorum	Kellogg's bedstraw	Native	Rubiaceae	-	-
Gayophytum diffusum	Diffuse gayophytum	Native	Onagraceae	-	-
Gayophytum diffusum ssp. parviflorum	Diffuse gayophytum	Native	Onagraceae	-	-
Gayophytum heterozygum	Zig zag gayophytum	Native	Onagraceae	-	-
Gemmabryum caespiticium	Gemmabryum caespiticium	Native	Bryaceae	-	-
Gentiana calycosa	Rainier pleated gentian	Native	Gentianaceae	-	-
Geum macrophyllum	Large leaved avens	Native	Rosaceae	-	-
Gilia modocensis	Modoc gilia	Native	Polemoniaceae	-	-
Glyceria elata	Tall mannagrass	Native	Poaceae	-	-
Gnaphalium palustre	Lowland cudweed	Native	Asteraceae	-	-
Hackelia floribunda	Many flowered stickseed	Native	Boraginaceae	-	-
Hazardia whitneyi	Whitney's bristleweed	Native	Asteraceae	-	-
Helenium bigelovii	Bigelow’s sneezeweed	Native	Asteraceae	-	-
Heuchera rubescens	Pink alumroot	Native	Saxifragaceae	-	-
Hieracium horridum	Prickly hawkweed	Native	Asteraceae	-	-
Holodiscus discolor	Oceanspray	Native	Rosaceae	-	-
Holodiscus discolor var. microphyllus	Small-leaf creambush	Native	Rosaceae	-	-
Hordeum brachyantherum ssp. brachyantherum	Meadow barley	Native	Poaceae	-	-
Horkelia fusca var. parviflora	Tawny horkelia	Native	Rosaceae	-	-
Hypericum anagalloides	Creeping st. john's wort	Native	Hypericaceae	-	-
Iris missouriensis	Rocky mountain iris	Native	Iridaceae	-	-
Juncus balticus ssp. ater	Baltic rush	Native	Juncaceae	-	-
Juncus bufonius var. occidentalis	Common toad rush	Native	Juncaceae	-	-
Juncus drummondii	Drummond's rush	Native	Juncaceae	-	-
Juncus mertensianus	Merten’s rush	Native	Juncaceae	-	-
Juncus nevadensis	Sierra rush	Native	Juncaceae	-	-
Juncus orthophyllus	Straight leaved rush	Native	Juncaceae	-	-
Juncus parryi	Parry's rush	Native	Juncaceae	-	-
Juncus saximontanus	Rocky mountain rush	Native	Juncaceae	-	-
Juncus tiehmii	Tiehm's rush	Naive	Juncaceae	-	-
Juniperus grandis	Sierra juniper	Native	Cupressaceae	-	-
Lecidea atrobrunnea	Brown tile lichen	Native	Lecideaceae	-	-
Lepidium densiflorum	Common pepperweed	Native	Brassicaceae	-	-
Lepidium montanum	Mountain pepperweed	Native	Brassicaceae	-	-

Scientific Name	Common Name	Native/Non-Native	Family	Treatment Strategy Level[1]	Status
Lepidium nitidum	Shining pepperweed	Native	Brassicaceae	-	-
Lepidium virginicum	Virgina pepperweed	Native	Brassicaceae	-	-
Lepidium virginicum ssp. virginicum	Wild pepper grass	Native	Brassicaceae	-	-
Leptosiphon bicolor	True babystars	Native	Polemoniaceae	-	-
Leptosiphon ciliatus	Whiskerbrush	Native	Polemoniaceae	-	-
Leptosiphon harknessii	Harkeness' flaxflower	Native	Polemoniaceae	-	-
Leucanthemum vulgare	Oxe eye daisy	Non-native	Asteraceae	-	-
Leymus cinereus	Great Basin Wild Rye	Native	Poaceae	-	-
Ligusticum grayi	Gray's licorice root	Native	Apiaceae	-	-
Lilium kelleyanum	Kelley's lily	Native	Liliaceae	-	-
Lilium parvum	Sierra tiger lily	Native	Liliaceae	-	-
Linanthus pungens	Granite prickly phlox	Native	Polemoniaceae	-	-
Linanthus pungens ssp. pulchriflorus	Linanthus pugens	Native	Polemoniaceae	-	-
Linum lewisii	Blue flax	Native	Linaceae	-	-
Listera convallarioides	Broad leaved tway blade	Native	Orchidaceae	-	-
Lithophragma glabrum	Bulbed woodland star	Native	Saxifragaceae	-	-
Lonicera involucrata var. involucrata	Twin berry	Native	Caprifoliaceae	-	-
Lupinus argenteus var. heteranthus	Silvery lupine	Native	Fabaceae	-	-
Lupinus breweri var. breweri	Brewer's lupine	Native	Fabaceae	-	-
Lupinus lepidus var. sellulus	Dwarf tidy lupine	Native	Fabaceae	-	-
Lupinus polyphyllus var. burkei	Large leaved lupine	Native	Fabaceae	-	-
Luzula parviflora	Small flowered wood rush	Native	Juncaceae	-	-
Luzula subcongesta	Donner wood rush	Native	Juncaceae	-	-
Maianthemum stellatum	Starry false lily of the valley	Native	Ruscaceae	-	-
Malus pumila	Paradise apple	Non-native	Rosaceae	-	-
Matricaria discoidea	Pineapple weed	Native	Asteraceae	-	-
Medicago lupulina	Black medick	Non-native	Fabaceae	-	-
Melica stricta	Nodding melica	Native	Poaceae	-	-
Mentha canadensis	Wild mint	Native	Lamiaceae	-	-
Mentzelia congesta	Clustered blazing star	Native	Loasaceae	-	-
Mentzelia laevicaulis	Giant blazingstar	Native	Loasaceae	-	-
Micranthes aprica	Sierra saxifrage	Native	Saxifragaceae	-	-
Micranthes nidifica	Peak saxifrage	Native	Saxifragaceae	-	-
Mimetanthe pilosa	Snouted monkey flower	Native	Phrymaceae	-	-
Mollugo verticillata	Indian chickweed	Non-native	Molluginaceae	-	-
Monardella odoratissima	Coyote-Mint	Native	Lamiaceae	-	-
Montia chamissoi	Spring beauty	Native	Montiaceae	-	-
Muhlenbergia asperifolia	Scratchgrass	Native	Poaceae	-	-
Muhlenbergia filiformis	Pullup muhly	Native	Poaceae	-	-
Muhlenbergia richardsonis	Richardson's muhly	Native	Poaceae	-	-
Myriopteris gracillima	Lace lip fern	Naitve	Pteridaceae	-	-

Scientific Name	Common Name	Native/Non-Native	Family	Treatment Strategy Level[1]	Status
Navarretia capillaris	Miniature gilia	Native	Polemoniaceae	-	-
Oenothera elata ssp. hirsutissima	Hooker's evening primrose	Native	Onagraceae	-	-
Osmorhiza berteroi	Sweet cicely	Native	Apiaceae	-	-
Osmorhiza occidentalis	Mountain sweet cicely	Native	Apiaceae	-	-
Oxyria digyna	Alpine mountain sorrel	Native	Polygonaceae	-	-
Panicum acuminatum var. fasciculatum	Pacific panic grass	Native	Poaceae	-	-
Parnassia palustris	Marsh grass of parnassus	Native	Parnassiaceae	-	-
Pectiantia breweri	Brewer's miterwort	Native	Saxifragaceae	-	-
Pedicularis groenlandica	Elephant head lousewort	Native	Orobanchaceae	-	-
Pellaea breweri	Brewer's cliff brake	Native	Pteridaceae	-	-
Pellaea bridgesii	Bridges' cliff brake	Native	Pteridaceae	-	-
Pellaea mucronata	Bird’s foot fern	Native	Pteridaceae	-	-
Penstemon heterodoxus	Sierra beardtongue	Native	Plantaginaceae	-	-
Penstemon newberryi	Mountain pride	Native	Plantaginaceae	-	-
Penstemon rostriflorus	Bridge penstemon	Native	Plantaginaceae	-	-
Penstemon rydbergii	Rydberg's penstemon	Native	Plantaginaceae	-	-
Penstemon speciosus	Royal beardtongue	Native	Plantaginaceae	-	-
Perideridia parishii	Parish's yampah	Native	Apiaceae	-	-
Phacelia hastata var. hastata	Mountain phacelia	Native	Boraginaceae	-	-
Phacelia heterophylla	Varileaf phacelia	Native	Boraginaceae	-	-
Philonotis pumila	Philonotis moss	Native	Bartramiaceae	-	-
Phleum pratense	Common timothy	Non-native	Poaceae	-	-
Phlox diffusa	Spreading phlox	Native	Polemoniaceae	-	-
Phoenicaulis cheiranthoides	Dagger pod	Native	Brassicaceae	-	-
Phoradendron juniperinum	Juniper mistletoe	Native	Viscaceae	-	-
Phyllodoce breweri	Brewer's mountain heather	Native	Ericaceae	-	-
Pinus contorta	Lodgepole pine	Native	Pinaceae	-	-
Pinus flexilis	Limber pine	Native	Pinaceae	-	-
Pinus jeffreyi	Jeffrey Pine	Native	Pinaceae	-	-
Pinus monophyla	Single-leaf pinyon pine	Native	Pinaceae	-	-
Pinus monticola	Western white pine	Native	Pinaceae	-	-
Piperia unalascensis	Rein orchid	Native	Orchidaceae	-	-
Plantago lanceolata	Ribwort	Non-native	Plantaginaceae	-	-
Plantago major	Common plaintain	Non-native	Plantaginaceae	-	-
Platanthera dilatata var. leucostachys	Sierra bog orchid	Native	Orchidaceae	-	-
Pleopsidium flavum	Gold cobblestone lichen	Native	Acarosporaceae	-	-
Poa compressa	Canada blue grass	Non-native	Poaceae	-	-
Poa cusickii ssp. epilis	Cusick’s bluegrass	Native	Poaceae	-	-
Poa fendleriana ssp. longiligula	Fendler’s blue grass	Native	Poaceae	-	-
Poa palustris	Fowl blue grass	Non-native	Poaceae	-	-
Poa pratensis	Kentucky blue grass	Non-native	Poaceae	-	-

Scientific Name	Common Name	Native/Non-Native	Family	Treatment Strategy Level[1]	Status
Poa secunda var. secunda	Rush blue grass	Native	Poaceae	-	-
Poa wheeleri	Wheeler's blue grass	Native	Poaceae	-	-
Pohlia camptotrachela	Pohlia camptotrachela	Native	Bryaceae	-	-
Pohlia nutans	Nodding thread-moss	Native	Bryaceae	-	-
Polygonum douglasii	Douglas knotweed	Native	Polygonaceae	-	-
Polygonum polygaloides	Milkwort knotweed	Native	Polygonaceae	-	-
Populus tremuloides	Quaking aspen	Native	Salicaceae	-	-
Populus trichocarpa	Black Cottonwood	Native	Salicaceae	-	-
Potentilla biennis	Biennial cinquefoi	Native	Rosaceae	-	-
Potentilla breweri	Brewer's cinquefoil	Native	Rosaceae	-	-
Potentilla gracilis var. elmeri	Elmer’s cinquefoil	Native	Rosaceae	-	-
Potentilla gracilis var. fastigiata	Slender cinquefoil	Native	Rosaceae	-	-
Primula tetrandra	Alpine shooting star	Native	Primulaceae	-	-
Prunus emarginata	Bitter cherry	Native	Rosaceae	-	-
Prunus ssp. (Cultivar)	-	-	Rosaceae	-	-
Pteridium aquilinum	Western brackenfern	Native	Dennstaedtiaceae	-	-
Pterospora andromedea	Pine drops	Native	Ericaceae	-	-
Ptychostomum creberrimum	Creberrimum fork-moss	Native	Bryaceae	-	-
Ptychostomum pseudotriquetrum	Long-leaved thread moss	Native	Bryaceae	-	-
Ptychostomum sp.	Ptychostomum sp.	Native	Bryaceae	-	-
Purshia tridentata	Bitterbrush	Native	Rosaceae	-	-
Pyrola asarifolia	Bog wintergreen	Native	Ericaceae	-	-
Pyrola dentata	Toothed wintergreen	Native	Ericaceae	-	-
Pyrola picta	Wintergreen	Native	Ericaceae	-	-
Pyrrocoma apargioides	Alpine pyrrocoma	Native	Asteraceae	-	-
Pyrrocoma uniflora	Plaintain goldenweed	Native	Asteraceae	-	-
Ranunculus cymbalaria	Alkali buttercup	Native	Asteraceae	-	-
Rhizoplaca melanophthalma	Green rock-posy	Native	Lecanoraceae	-	-
Rhodiola integrifolia ssp. integrifolia	Ledge stonecrop	Native	Crassulaceae	-	-
Rhododendron columbianum	Western labrador tea	Native	Ericaceae	-	-
Rhododendron occidentale	Western azalea	Native	Ericaceae	-	-
Ribes cereum	Wax current	Native	Grossulariaceae	-	-
Ribes montigenum	Alpine prickly current	Native	Grossulariaceae	-	-
Rorippa curvipes	Blunt leaf yellow cress	Native	Brassicaceae	-	-
Rorippa curvisiliqua	Curvepod yellow cress	Native	Brassicaceae	-	-
Rosa woodsii ssp. ultramontana	Interior rose	Native	Rosaceae	-	-
Rubus parviflorus	Thimbleberry	Native	Rosaceae	-	-
Rumex salicifolius	Willow leaved dock	Native	Polygonaceae	-	-
Rusavskia elegans	Elegant sunburst lichen	Native	Teloschistaceae	-	-
Salix exigua	Narrowleaf willow	Native	Salicaceae	-	-
Salix geyeriana	Geyers’ willow	Native	Salicaceae	-	-

Scientific Name	Common Name	Native/Non-Native	Family	Treatment Strategy Level[1]	Status
Salix lasiandra var. caudata	Shining willow	Native	Salicaceae	-	-
Salix lasiolepis	Arroyo willow	Native	Salicaceae	-	-
Salix lemmonii	Lemmon's willlow	Native	Salicaceae	-	-
Salix lutea	Yellow willow	Native	Salicaceae	-	-
Salix orestera	Sierra willow	Native	Salicaceae	-	-
Salix scouleriana	Scouler's willow	Native	Salicaceae	-	-
Salsola tragus	Russian thistle	Non-native	Chenopodiaceae	-	-
Sambucus mexicana	Blue elderberry	Native	Viburnaceae	-	-
Sambucus racemosa var. racemosa	Pacific red elderberry	Native	Viburnaceae	-	-
Saponaria officinalis	Bouncing bet	Non-native	Caryophyllaceae	-	-
Schoenoplectus pungens	Common threesquare	Native	Cyperaceae	-	-
Scirpus microcarpus	Small-fruited bulrush	Native	Cyperaceae	-	-
Scrophularia californica	California bee plant	Naive	Scrophulariaceae	-	-
Sedum obtusatum	Sierra stonecrop	Native	Crassulaceae	-	-
Selaginella watsonii	Watson's spike moss	Native	Selaginellaceae	-	-
Senecio aronicoides	California butterweed	Native	Asteraceae	-	-
Senecio integerrimus var. exaltatus	Columbia ragwort	Native	Asteraceae	-	-
Senecio scorzonella	Sierra ragwort	Native	Asteraceae	-	-
Senecio triangularis	Arrow leaved ragwort	Native	Asteraceae	-	-
Sidalcea oregana	Oregon checker mallow	Native	Malvaceae	-	-
Silene bernardina	Palmer's campion	Native	Caryophyllaceae	-	-
Silene menziesii	Menzie's campion	Native	Caryophyllaceae	-	-
Sisyrinchium idahoense var. occidentale	Idaho blue eyed grass	Native	Iridaceae	-	-
Solanum xanti	Chaparral nightshade	Native	Solanaceae	-	-
Solidago elongata	West coast Canada goldenrod	Native	Asteraceae	-	-
Solidago spectabilis	Nevada goldenrod	Native	Asteraceae	-	-
Sorbus californica	California mountain ash	Native	Rosaceae	-	-
Spiraea splendens	Rose meadowsweet	Native	Rosaceae	-	-
Stephanomeria exigua	Small wirelettuce	Native	Asteraceae	-	-
Stipa comata var. comata	Needle & thread grass	Native	Poaceae	-	-
Stipa hymenoides	Indian rice grass	Native	Poaceae	-	-
Stipa nevadensis	Nevada needle grass	Native	Poaceae	-	-
Stipa occidentalis var. pubescens	Common western needle grass	Native	Poaceae	-	-
Stipa pulchra	Purple needle grass	Native	Poaceae	-	-
Streptanthus tortuosus	Mountain jewelflower	Native	Brassicaceae	-	-
Symphoricarpos mollis	Creeping snowberry	Native	Caprifoliaceae	-	-
Symphoricarpos rotundifolius var. rotundifolius	Roundleaf snowberry	Native	Caprifoliaceae	-	-
Symphyotrichum spathulatum var. spathulatum	Western mountain aster	Native	Asteraceae	-	-
Thalictrum fendleri	Fendler's meadow rue	Native	Ranunculaceae	-	-
Thelypodium crispum	Wavy leaved thelypodium	Native	Brassicaceae	-	-
Trichostema austromontanum	Southern bluecurls	Native	Lamiaceae	-	-

Scientific Name	Common Name	Native/Non-Native	Family	Treatment Strategy Level[1]	Status
Trifolium cyathiferum	Bowl clover	Native	Fabaceae	-	-
Trifolium longipes	Long stalked clover	Native	Fabaceae	-	-
Trifolium microcephalum	Hairy clover	Native	Fabaceae	-	-
Trisetum canescens	Tall false oat grass	Native	Poaceae	-	-
Trisetum spicatum	Narrow oatgrass	Native	Poaceae	-	-
Triteleia ixioides	Pretty face	Native	Themidaceae	-	-
Triticum aestivum	Common wheat	Non-native	Poaceae	-	-
Tsuga mertensiana	Mountain hemlock	Native	Pinaceae	-	-
Umbilicaria hyperborea	Blistered rock tripe	Native	Umbilicariaceae	-	-
Vaccinium uliginosum	Blueberry	Native	Ericaceae	-	-
Valeriana californica	California valerian	Native	Valerianaceae	-	-
Veratrum californicum	California corn lily	Native	Melanthiaceae	-	-
Veronica americana	American brooklime	Native	Plantaginaceae	-	-
Veronica peregrina ssp. xalapensis	Purslane speedwell	Native	Plantaginaceae	-	-
Veronica serpyllifolia ssp. humifusa	Bright blue speedwell	Native	Plantaginaceae	-	-
Viola macloskeyi	Macloskey's violet	Native	Violaceae	-	-
Viola purpurea	Goosefoot violet	Native	Violaceae	-	-
Wyethia mollis	Mule ears	Native	Asteraceae	-	-

[1] Treatment strategy levels are based on the Inyo National Forest (INF) Invasive Plant Species List (INF 2023) and are classified as follows:
1. Eradicate: Annually treat and monitor the infestation with the goal of complete elimination of the species.
2. Control: Treat and monitor a portion of the infestations each year, focusing on reducing the acreage and percent cover over time.
3. Contain: Treat leading edge or new satellite infestations, or where concurrent with high-value resources.
4. Limited/No treatment: Limited to site-specific restoration projects or no treatment efforts at this time.

[2] Data was collected by E Read and Associates, Inc. in 2022 as part of long-term riparian monitoring sites within this reach. This species was not seen during TERR 1 technical studies completed in 2023.

APPENDIX F
CNDDB Forms

(CONFIDENTIAL)

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CONFIDENTIAL INFORMATION

The following appendix is being withheld from public disclosure in accordance with applicable regulations. It contains details on the locations of special-status biological resources and qualifies as Confidential Information (18 Code of Federal Regulations § 385.1112). Disclosure of such information could be harmful to these resources. To further understand the Federal Energy Regulatory Commission's regulations regarding confidential filings, visit: https://www.ferc.gov/foia.

TERR 1, Appendix F CNDDB Forms (Confidential)

TERR 1, Appendix F will not be distributed to the general public. Documents containing Confidential Information may be requested by entities and organizations with jurisdiction over these resources. To request copies, please contact Matthew Woodhall, SCE Relicensing Project Manager at (909) 362-1764 or matthew.woodhall@sce.com.

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APPENDIX G

Representative Photographs of Special Status Plants and Habitat

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Waugh Lake



Mature whitebark pine cluster found in the PIAL 1 polygon (left). This habitat is on a north-facing slope in a Lodgepole Pine / Subalpine Conifer alliance. Large mature whitebark pines can be seen in the background (right)



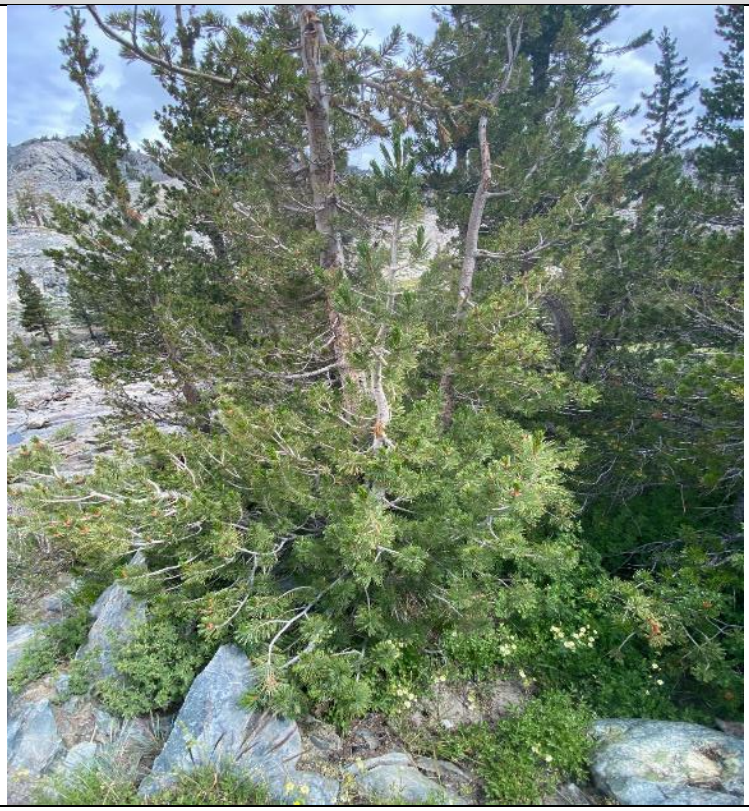
Mature whitebark pine (left) and whitebark pine cone (right) found in PIAL 2 polygon. This habitat is on a south-facing slope in the Subalpine Conifer Alliance.



Mature whitebark pine growing above Rush Meadows Dam on south facing rocky slope.



Mature whitebark pine found in PIAL 6 polygon. Habitat is south facing and in the Alpine Grasses and Forbs alliance.

Rush Meadows Dam

Unknown five-needle pine cluster found in U5NP 3 polygon near Rush Meadows Dam. This habitat is on a northwest-facing slope in a Lodgepole Pine Alliance.

Whitebark pine found in the PIAL 7 polygon. This habitat is on a south facing slope in a barren area.



Unknown five-needle pine growing out of rocks near Rush Meadows Dam in the PIAL 9 polygon.

Rush Creek Below Rush Meadows Dam



Clump of mature whitebark pines found along the south shore of Rush Creek near Rush Meadows Dam. The habitat is north facing and within the Lodgepole Pine Alliance.



Mature whitebark pine found in PIAL 12 polygon. Thia habitat is along the south shore (north-facing aspect) of Rush Creek in the Lodgepole Pine Alliance.



Mature whitebark pine clump found in polygon PIAL 18. This habitat is along the south shore of Rush Creek (north-facing slope) and within the Lodgepole Pine Alliance.



Mature whitebark pine found in PIAL 22 polygon (left) with a whitebark pine cone found nearby (right). This habitat is along the north shore of Rush Creek (southwest-facing aspect) within the Lodgepole Pine Alliance.



Mature whitebark pine in the polygon PIAL 10. This habitat is on the north shore of Rush Creek (south-facing slope) and within the Willow (Shrub) Alliance.

Gem Lake



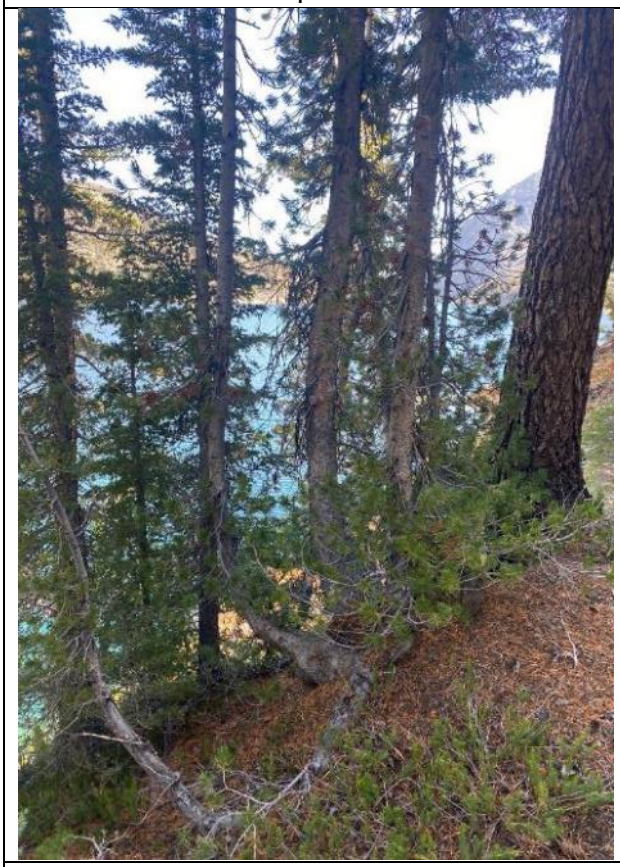
Mature whitebark pine (left) and nearby whitebark pinecone (right) found along north shore of Gem Lake in the Low Sagebrush Alliance.

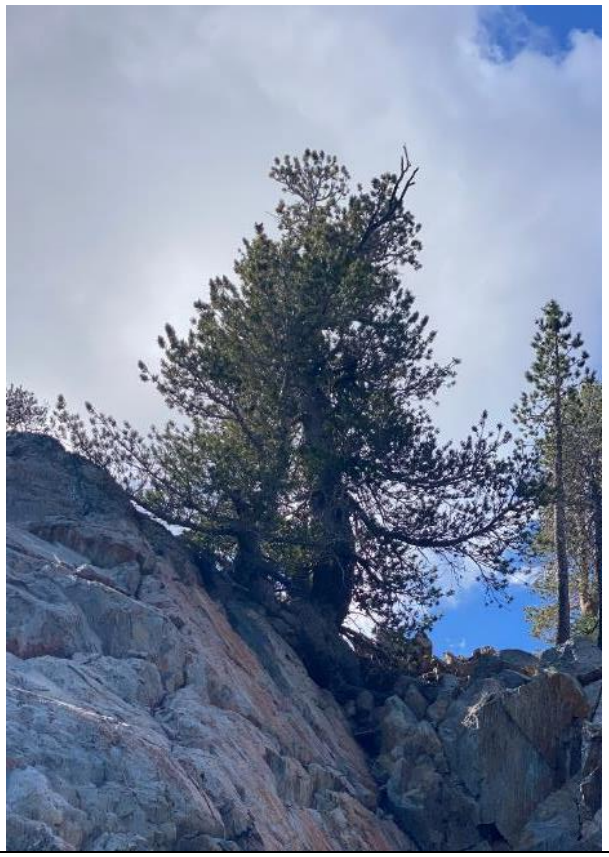


Mature whitebark pine found on northeast shore of Gem Lake (southwest-facing slope) within the Subalpine Conifer Alliance.



Mature whitebark pine found in polygon PIAL 34. This habitat is on the north shore of Gem Lake within the Subalpine Conifer Alliance.





Mature whitebark pines found in the PIAL 30 polygon. Thia habitat is on the southwest shore of Gem Lake (northeast-facing slope) and within the Subalpine Conifer Alliance

Gem Dam

Whitebark pine habitat around Gem Dam and Rush Creek. Mature whitebark pine trees were observed around Rush Creek. Unknown five-needle pines were observed growing out of rocky areas around Gem Dam and along Rush Creek.

Agnew Lake

Mature whitebark pine found in polygon PIAL 38. This habitat is on the southeast shore of Agnew Lake (northwest-facing slope) and within the Lodgepole Pine Alliance.

Unknown five-needle pine found in the polygon U5NP 11 near Rush Creek below Gem Dam. This habitat is on a north-facing slope in the Subalpine Conifer Alliance.

APPENDIX H
Target Non-Native Invasive Plant Species

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Appendix H. Target Non-Native Invasive Plant Species

Scientific Name	Common Name
Treatment Strategy 1: Eradicate[1]	
Acroptilon repens	Russian knapweed
Ailanthus altissima	tree of heaven
Centaurea diffusa	diffuse knapweed
Centaurea solstitialis	yellow star-thistle
Centaurea stoebe ssp. *micranthos*	spotted knapweed
Cirsium arvense	Canada thistle
Lepidium appelianum	hairy whitetop
Lepidium chalepensis	lens-podded hoary cress
lepidium draba	heart-podded hoary cress
Lepidium latifolium	perennial pepperweed
Linaria dalmatica	Dalmatian toadflax
Linaria vulgaris	butter and eggs
Spartium junceum	Spanish broom
Treatment Strategy 2: Control	
Dipsacus fullonum	Fuller's teasel
Elaeagnus angustifolia	Russian olive
Halogeton glomeratus	saltlover
Rubus armeniacus	Himalayan blackberry
Saponaria officinalis	bouncingbet
Tamarix ramosissima	saltcedar
Tribulus terrestris	puncturevine
Ulmus pumila	Siberian elm
Treatment Strategy 3: Contain	
Bassia hyssopifolia	fivehorn smotherweed
Bromus madritensis ssp. *rubens*	red brome
Bromus tectorum	cheatgrass
Cirsium vulgare	bull thistle
Convolvulus arvensis	field bindweed
Hirschfeldia incana	shortpod mustard
Holcus lanatus	common velvetgrass
Lotus corniculatus	bird's-foot trefoil
Marubium vulgare	horehound
Melilotus sp.	sweetclover
Penstemon subglaber	smooth penstemon
Robinia pseudoacacia	black locust

Scientific Name	Common Name
Salsola tragus	prickly Russian thistle
Sonchus oleraceus	common sowthistle
Treatment Strategy 4: Limited or No Treatment	
Bromus diandrus	ripgut brome
Bromus japonicus	field brome
Ceratocephala testiculata	curveseed butterwort
Chorispora tenella	crossflower
Descurainia sophia	herb sophia
Erodium cicutarium	redstem stork's bill
Grindelia squarrosa var. *serrulata*	curlycup gumweed
Hordeum murinum	foxtail barley
Lactuca serriola	prickly lettuce
Malva neglecta	common mallow
Poa bulbosa	bulbous bluegrass
Polygonum arenastrum	oval-leaf knotweed
Polygonum aviculare	prostrate knotweed
Polypogon monspeliensis	annual rabbitsfoot grass
Rumex crispus	curly dock
Schismus arabicus	Arabian schismus
Sisymbrium altissimum	tall tumblemustard
Spergularia rubra	red sandspurry
Taraxacum officinale	common dandelion
Tragopogon dubius	yellow salsify
Trifolium repens	white clover
Verbascum thapsus	common mullein
Vulpia myuros	annual fescue

Source: INF (Inyo National Forest). 2023. List of At-Risk and Invasive Plants for the Inyo National Forest. Provided by Blake Engelhardt, INF Botanist on February 8, 2023.

[1] Mapped infestations and treatment strategy for all currently known invasive plant species on the Inyo NF; population and acreage information from Inyo NF Invasive Plant Inventory Database (NRIS, April 2018).

1. Eradicate: Annually treat and monitor the infestation with the goal of complete elimination of the species.
2. Control: Treat and monitor a portion of the infestations each year, focusing on reducing the acreage and percent cover over time.
3. Contain: Treat leading edge or new satellite infestations, or where concurrent with high-value resources.
4. Limited/No treatment: Limited to site-specific restoration projects or no treatment efforts at this time.

APPENDIX I

Representative Photographs of Non-Native Invasive Plants and Habitat

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Appendix I. Representative Photographs of Non-Native Invasive Plants and Habitat



Cheatgrass. Cheatgrass (*Bromus tectorum*) growing in the Rush Creek Powerhouse area (right) and along the tram tracks to Agnew Lake (left).



Spotted knapweed. Spotted knapweed (*Centaurea stoebe*) found near South Rush Creek Cottage.



Bull thistle. Bull thistle (*Cirsium vulgare*) found in the Rush Creek Powerhouse area.



White sweetclover. white sweetclover (*Melilotus albus*) growing behind the machine shop in the Rush Creek Powerhouse area.



Common knotgrass. Common knotgrass (*Polygonum aviculare*) found near South Rush Creek structures growing in gravelly area.



Curly dock. Curly dock (*Rumex crispus*) growing along the shore of Gem Lake.



Russian thistle. Russian thistle (*Salsola tragus*) found in the Rush Creek Powerhouse Enhancement Area in a gravel patch.



Soapwort. Soapwort (*Saponaria officinalis*) found near the Rush Creek Powerhouse Cottage and Woodshed growing alongside pavement.



Red sandspurry. Red sandspurry (*Spergularia rubra*) found in the Rush Creek Powerhouse Enhancement Area in a gravel patch.



Common dandelion. Common dandelion (*Taraxacum officinale*) growing along the tram tracks to Agnew Lake.



Yellow salsify. Yellow salsify (*Tragopogon dubius*) near Rush Creek Powerhouse and South Rush Creek structures.



White clover. White clover (*Trifolium repens*) found in the Rush Creek Powerhouse area near the garage and pump house.



Common mullein. Common mullein (*Verbascum thapsus*) and bull thistle near the Rush Creek Powerhouse Enhancement Area.



Filamentous algae. Limited filamentous algae growth in Rush Creek below Silver Lake observed by biologists conducting studies for the AQ 1 – Instream Flow Technical Study Plan.

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APPENDIX J

Photographs of Botanical Transects within the Historic Inundation Zone of Project Reservoirs

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Waugh Lake



Photo 1: Waugh Lake Transect 1, photo taken from the start of the transect at the waterline (i.e., WL-T1 Start).



Photo 2: Waugh Lake Transect 2, photo taken from the end of the transect above the OHWM (i.e., WL-T2 End).



Photo 3: Waugh Lake Transect 3, photo taken from the start of the transect at the waterline (i.e., WL-T3 Start).

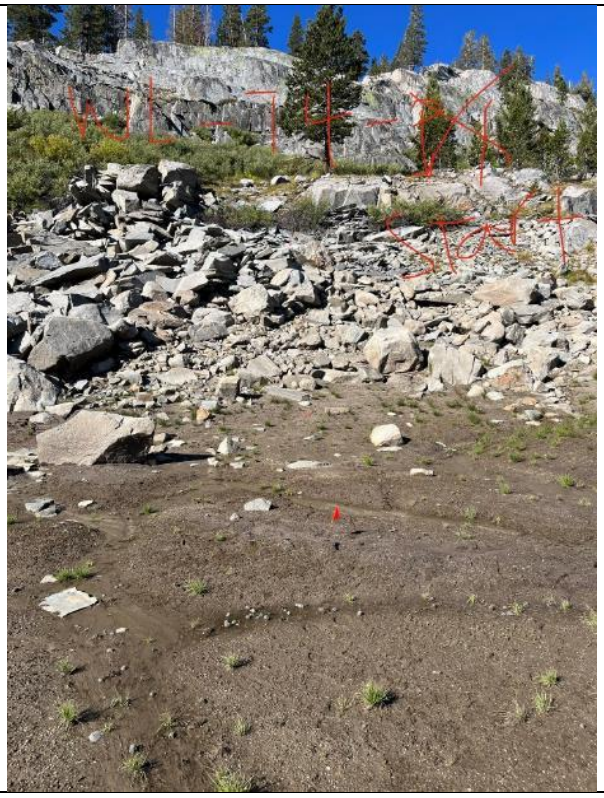


Photo 4: Waugh Lake Transect 4, photo taken from the start of the transect at the waterline (i.e., WL-T4 Start).



Photo 5: Waugh Lake Transect 5, photo taken from the start of the transect at the waterline (i.e., WL-T5 Start).

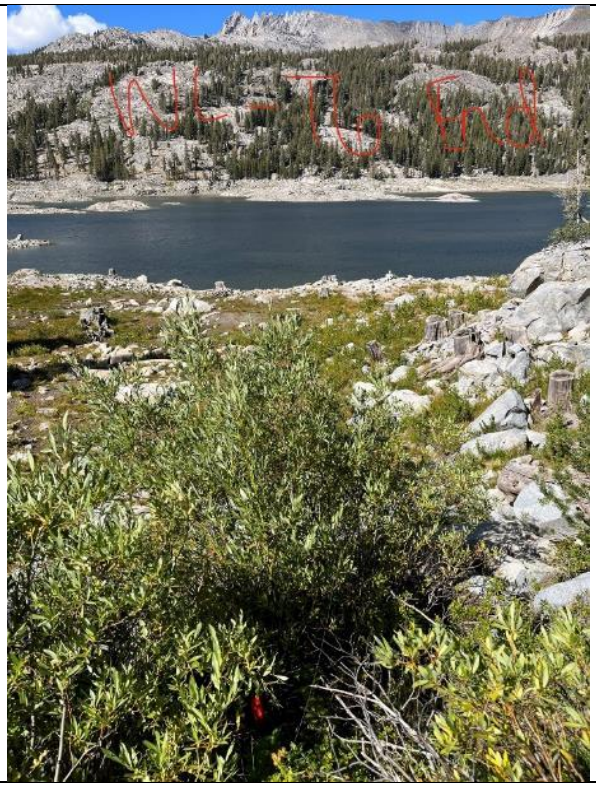


Photo 6: Waugh Lake Transect 6, photo taken from the end of the transect above the OHWM (i.e., WL-T6 End).

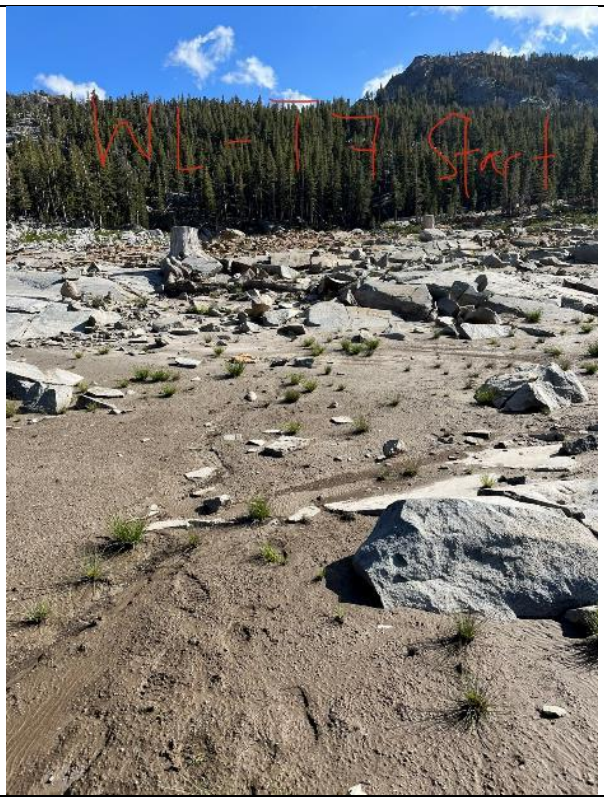


Photo 7: Waugh Lake Transect 7, photo taken from the start of the transect at the waterline (i.e., WL-T7 Start).



Photo 8: Waugh Lake Transect 8, photo taken from the start of the transect at the waterline (i.e., WL-T8 Start).



Photo 9: Waugh Lake Transect 9, photo taken from the start of the transect at the waterline (i.e., WL-T9 Start).

Gem Lake



Photo 10: Gem Lake Transect 1, photo taken from the start of the transect at the waterline (i.e., GL-T1 Start).

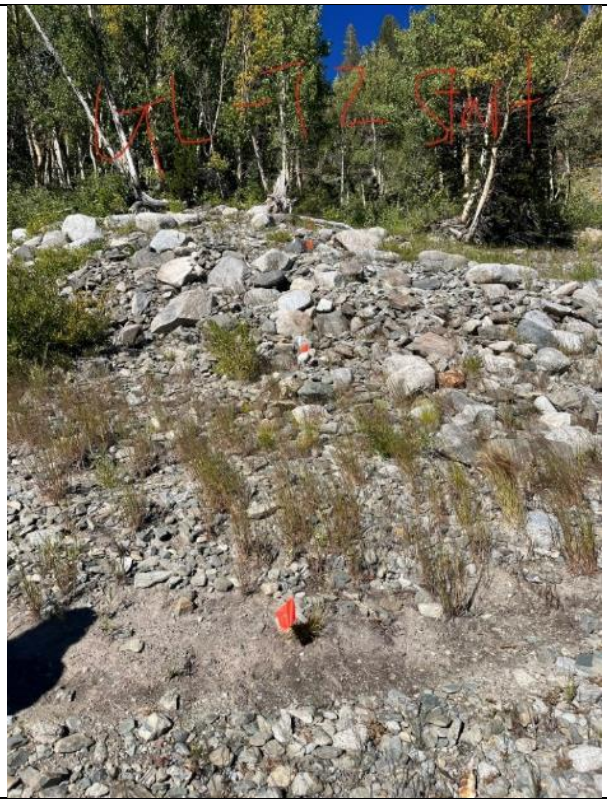


Photo 11: Gem Lake Transect 2, photo taken from the start of the transect at the waterline (i.e., GL-T2 Start).

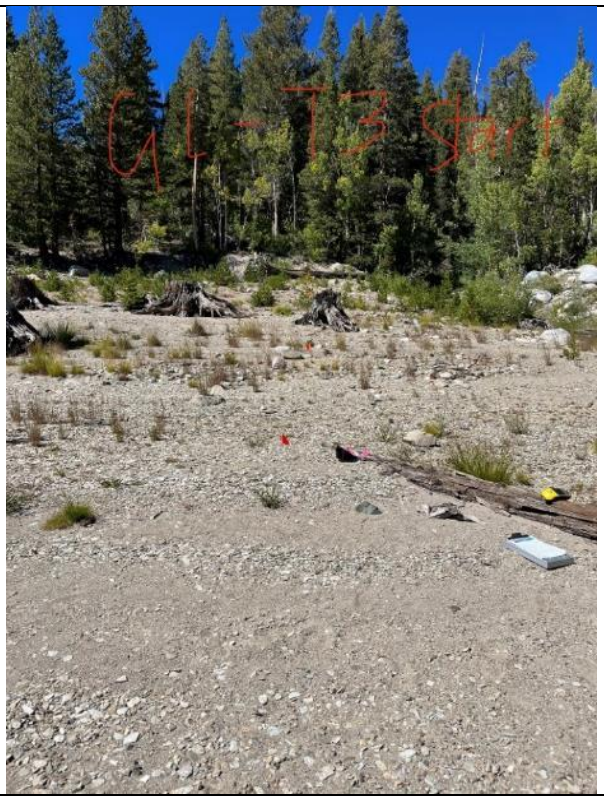


Photo 12: Gem Lake Transect 3, photo taken from the start of the transect at the waterline (i.e., GL-T3 Start).



Photo 13: Gem Lake Transect 4, photo taken from the end of the transect above the OHWM (i.e., GL-T4 End).

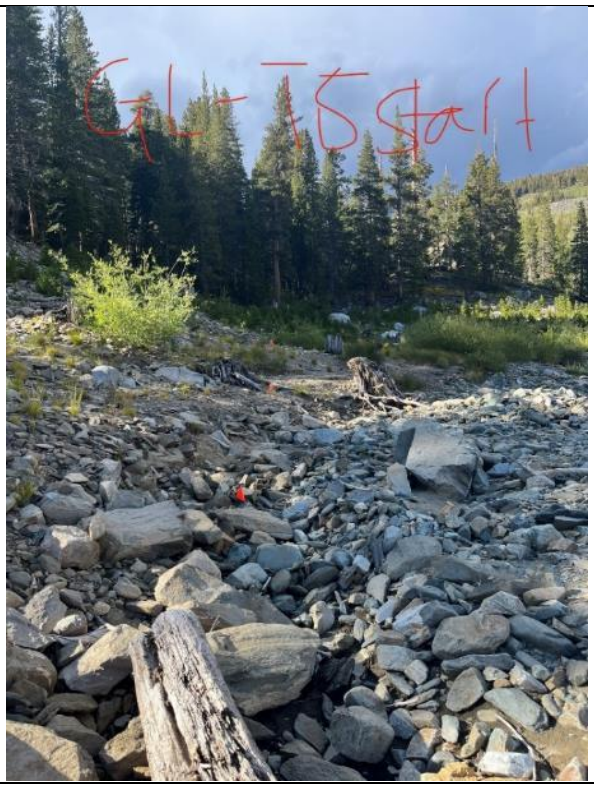


Photo 14: Gem Lake Transect 5, photo taken from the start of the transect at the waterline (i.e., GL-T5 Start).



Photo 15: Gem Lake Transect 6, photo taken from the start of the transect at the waterline (i.e., GL-T6 Start).

Agnew Lake



Photo 16: Agnew Lake Transect 1, photo taken from the start of the transect at the waterline (i.e., AL-T1 Start).

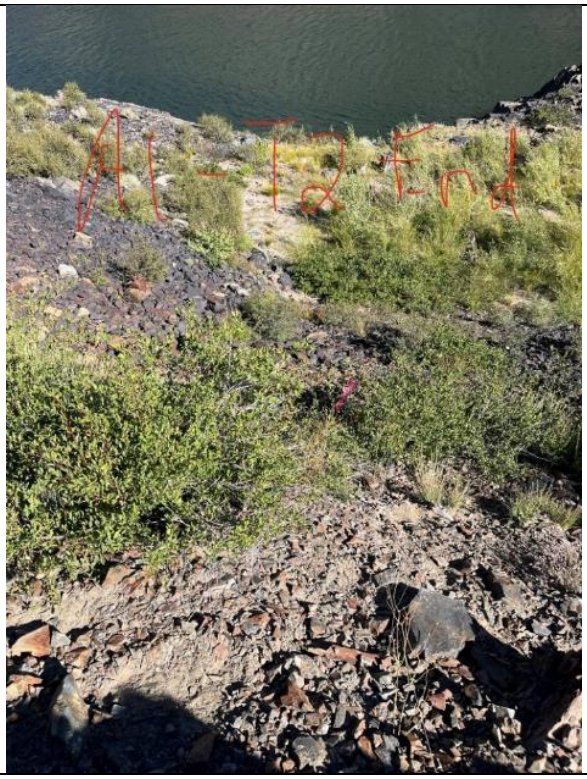


Photo 17: Agnew Lake Transect 2, photo taken from the end of the transect above the OHWM (i.e., AL-T2 End).

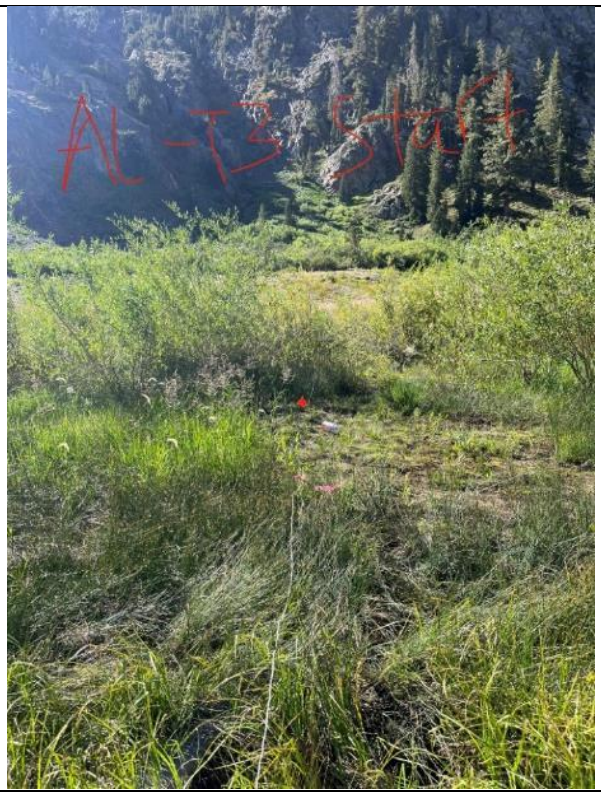


Photo 18: Agnew Lake Transect 3, photo taken from the start of the transect at the waterline (i.e., AL-T3 Start).



Photo 19: Agnew Lake Transect 4, photo taken from the start of the transect at the waterline (i.e., AL-T4 Start).



Photo 20: Agnew Lake Transect 5, photo taken from the end of the transect at the waterline (i.e., AL-T5 Start).

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APPENDIX K

Waugh Lake Transects Plotted Against a Time Series of Waugh Lake Reservoir Elevations Since 2017

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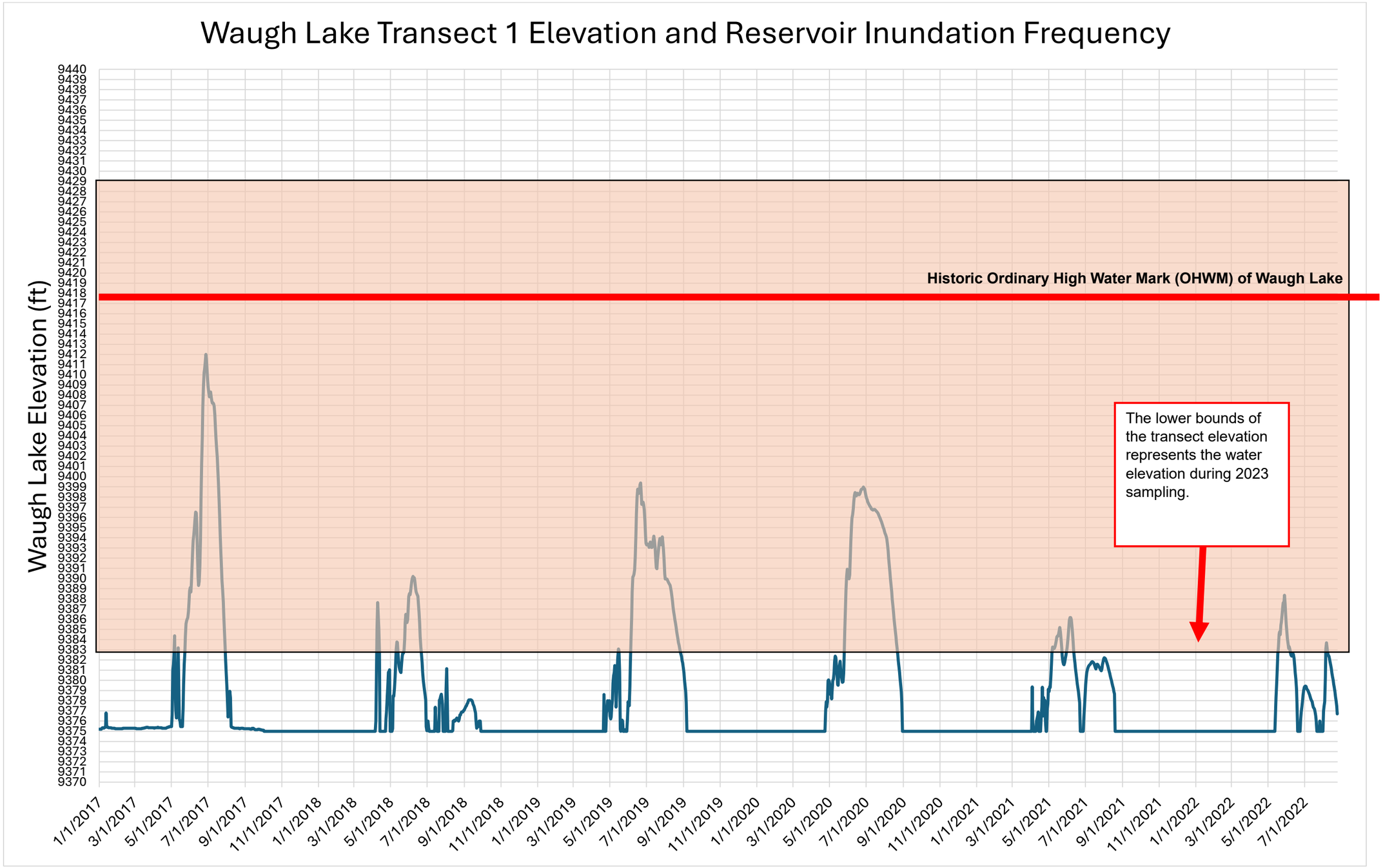


Figure J-1. Frequency of Inundation along Waugh Lake Transect 1 Since 2017.
The orange box represents the elevation range of Transect 1. The blue line presents a time series of reservoir elevation levels since 2017.

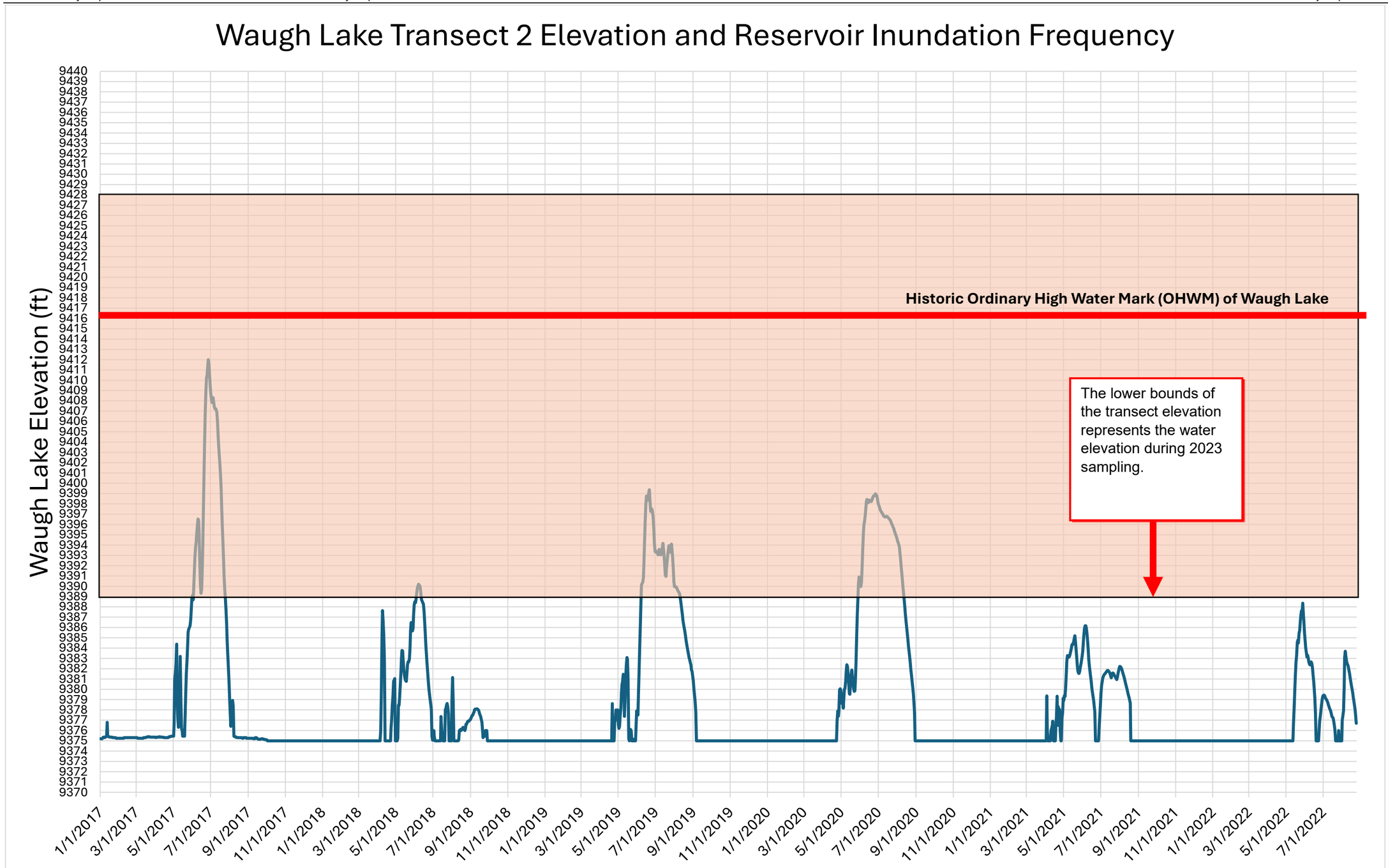


Figure J-2. Frequency of Inundation along Waugh Lake Transect 2 Since 2017.
The orange box represents the elevation range of Transect 1. The blue line presents a time series of reservoir elevation levels since 2017.

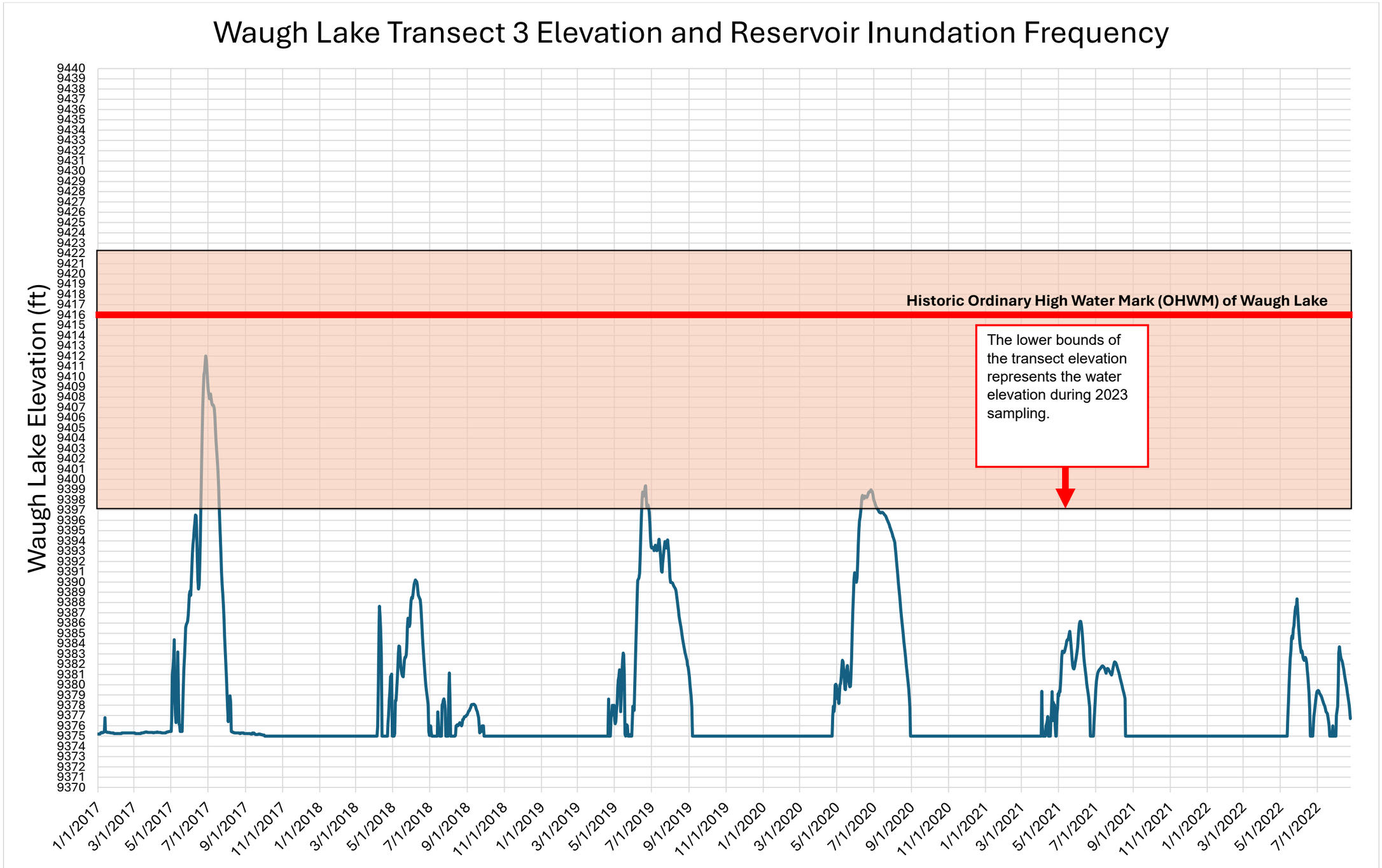


Figure J-3. Frequency of Inundation along Waugh Lake Transect 3 Since 2017.
The orange box represents the elevation range of Transect 1. The blue line presents a time series of reservoir elevation levels since 2017.

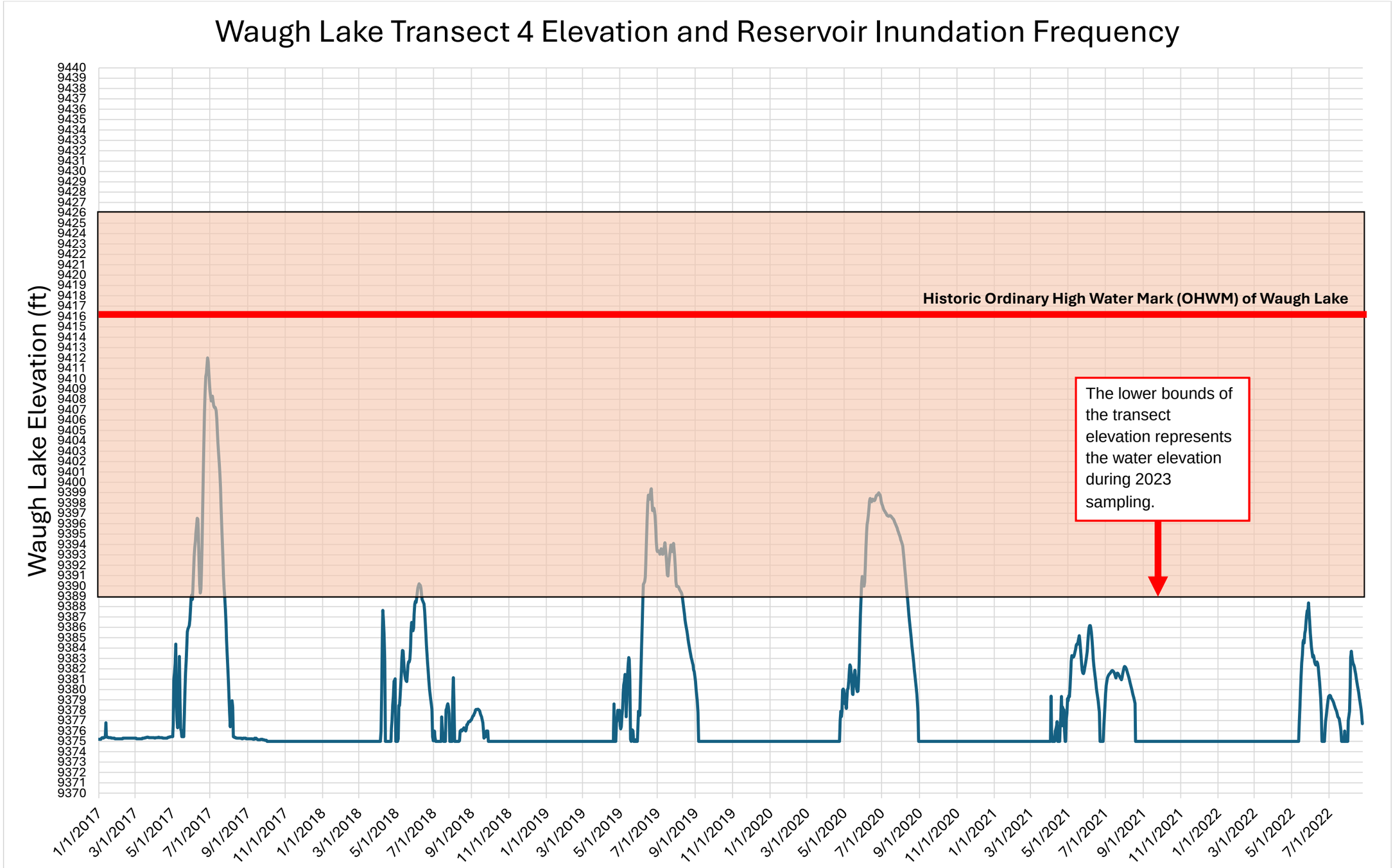


Figure J-4 Frequency of Inundation along Waugh Lake Transect 4 Since 2017.
The orange box represents the elevation range of Transect 1. The blue line presents a time series of reservoir elevation levels since 2017.

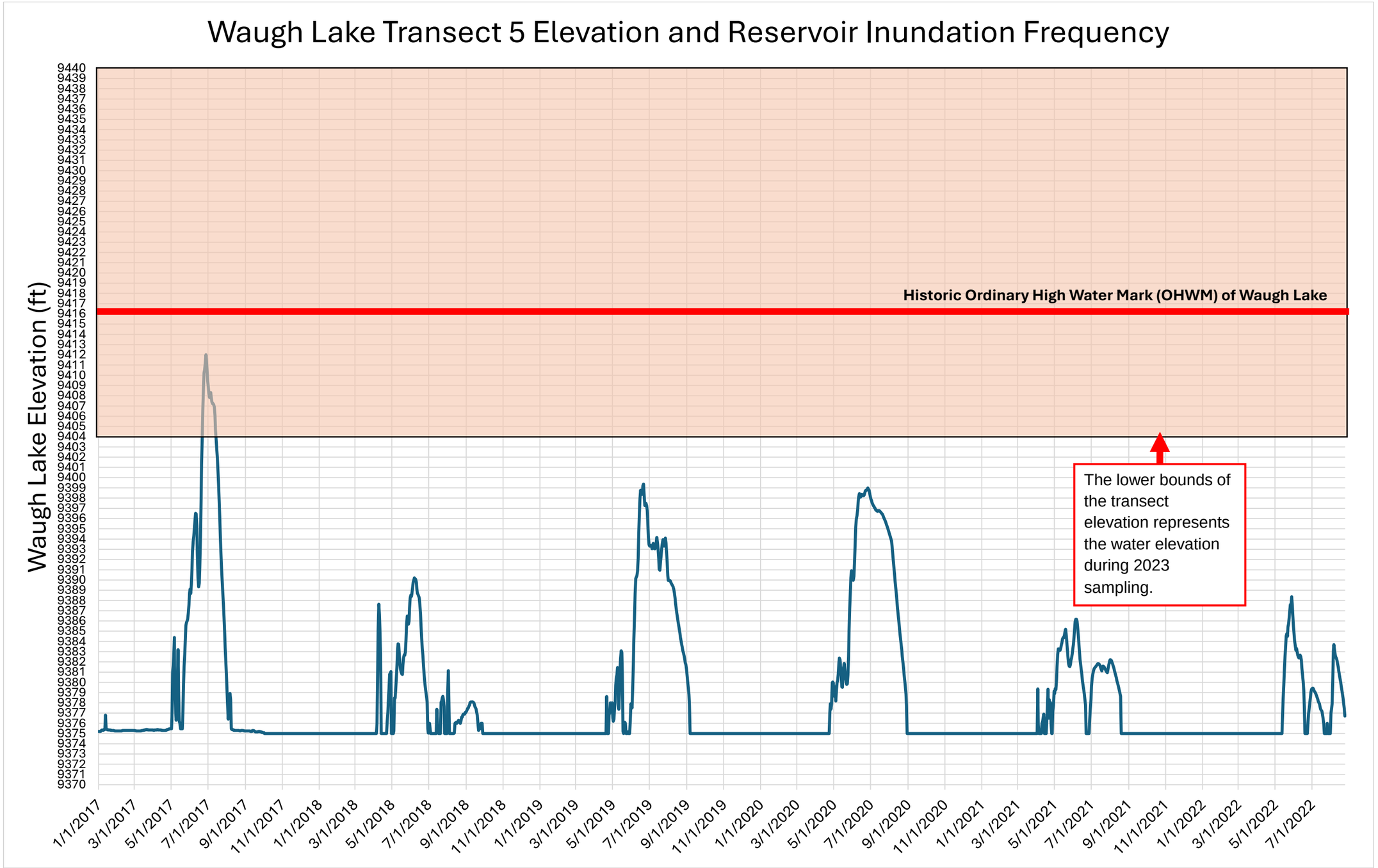


Figure J-5. Frequency of Inundation along Waugh Lake Transect 5 Since 2017.
The orange box represents the elevation range of Transect 1. The blue line presents a time series of reservoir elevation levels since 2017.

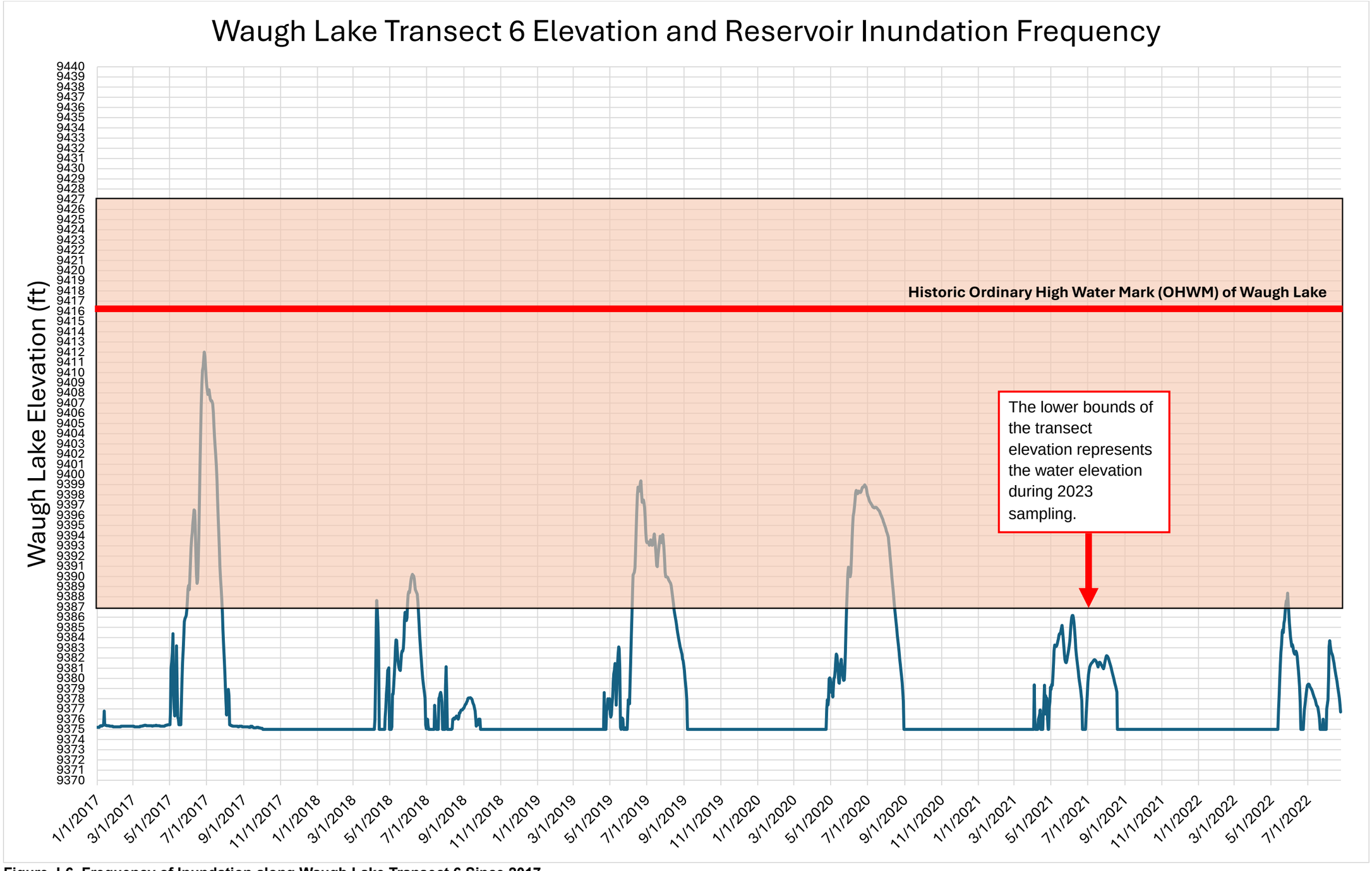


Figure J-6. Frequency of Inundation along Waugh Lake Transect 6 Since 2017.
The orange box represents the elevation range of Transect 1. The blue line presents a time series of reservoir elevation levels since 2017.

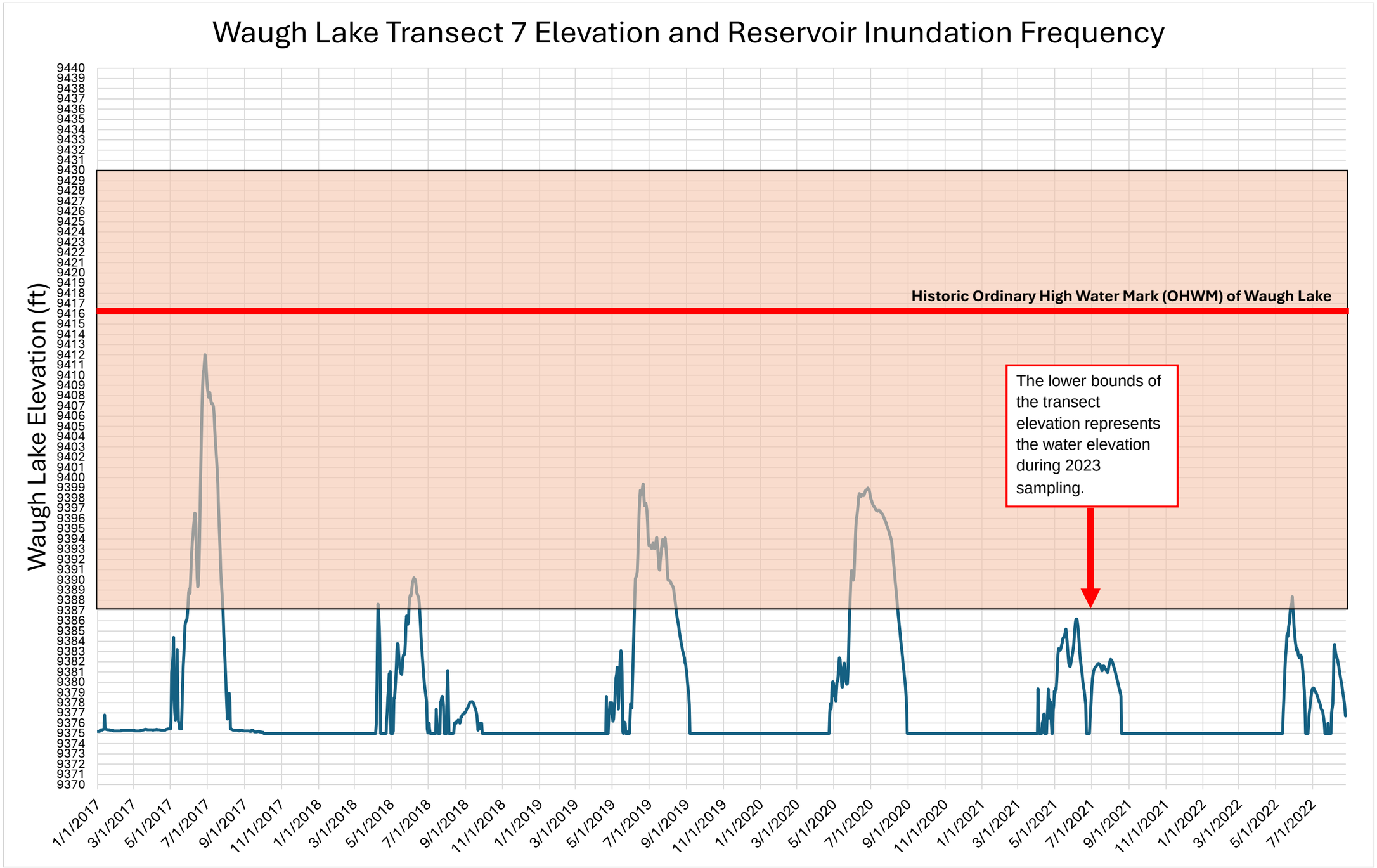


Figure J-7. Frequency of Inundation along Waugh Lake Transect 7 Since 2017.
The orange box represents the elevation range of Transect 1. The blue line presents a time series of reservoir elevation levels since 2017.

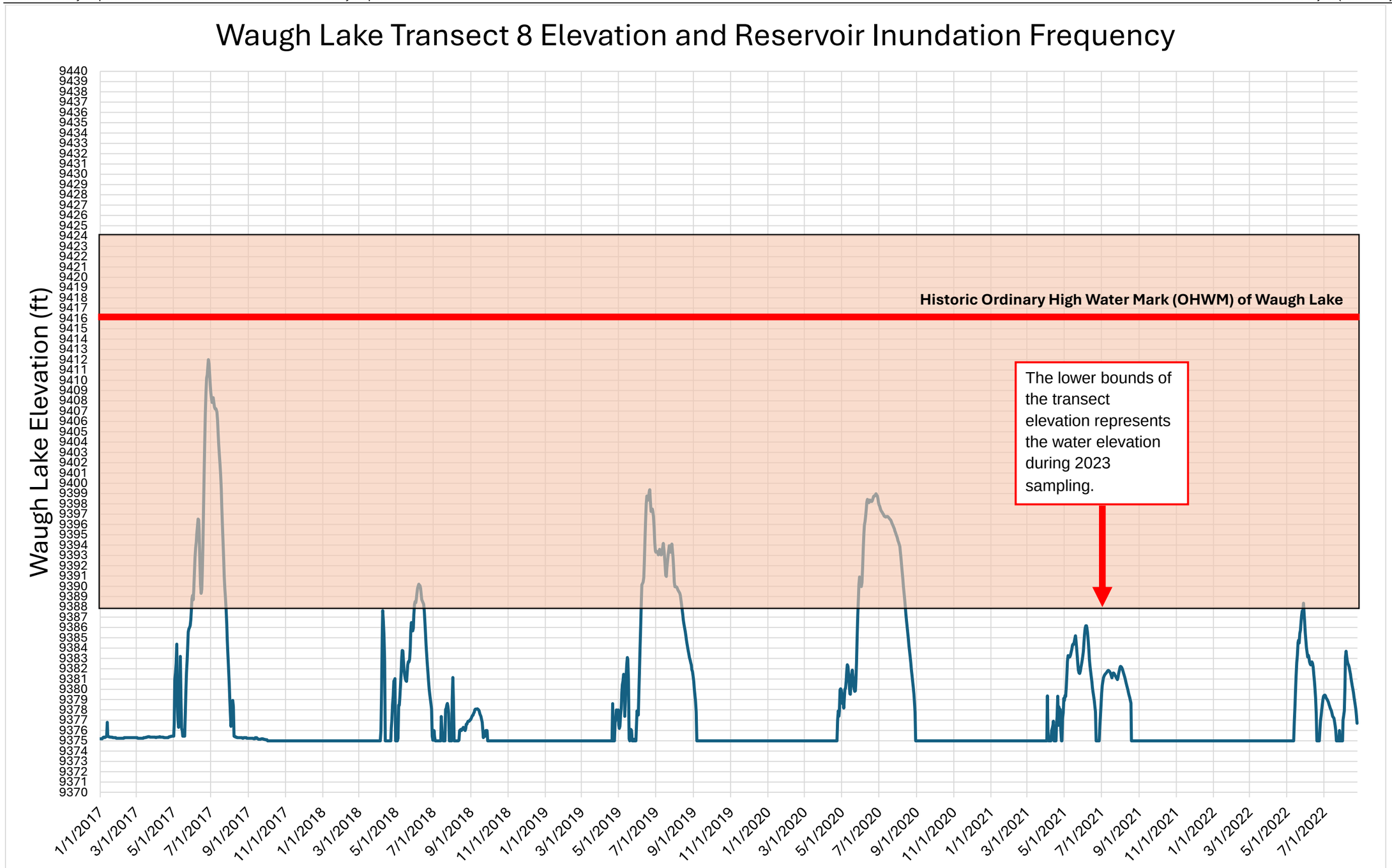


Figure J-8. Frequency of Inundation along Waugh Lake Transect 8 Since 2017.
The orange box represents the elevation range of Transect 1. The blue line presents a time series of reservoir elevation levels since 2017.

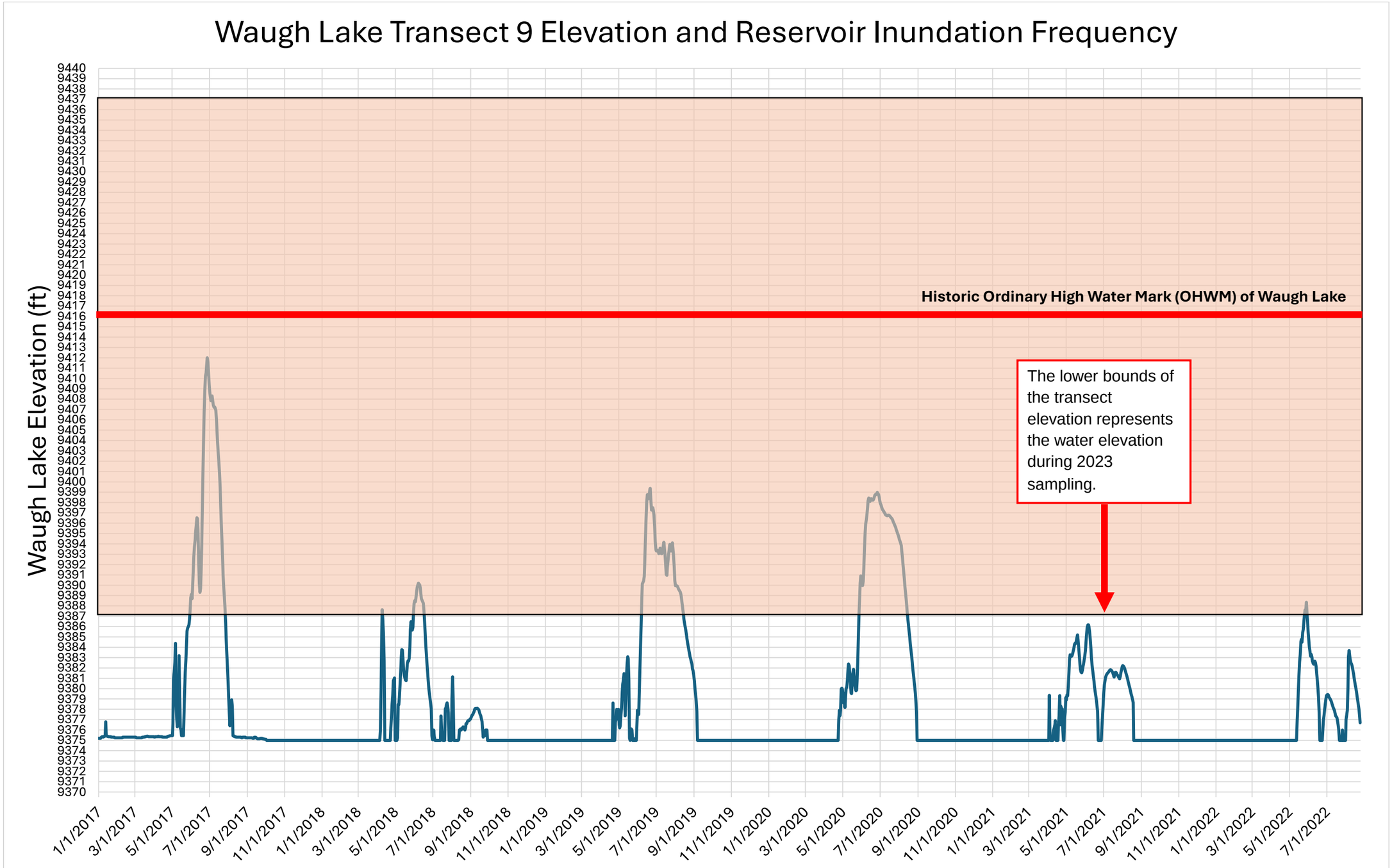


Figure J-9. Frequency of Inundation along Waugh Lake Transect 9 Since 2017.
The orange box represents the elevation range of Transect 1. The blue line presents a time series of reservoir elevation levels since 2017.

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Plant Species Observed			Waugh Lake Transects									Gem Lake Transects						Agnew Lake Transects				
Scientific Name	**Common Name**	**Native Status**	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T7**	**T8**	**T9**	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T1**	**T2**	**T3**	**T4**	**T5**
GRAMINOIDS																						
Agrostis idahoensis	Idaho bentgrass	Native			X		X	X	X											X	X	
Agrostis scabra	rough bentgrass	Native	X	X			X	X	X		X			X	X		X	X				X
Agrostis variabilis	mountain redtop	Native	X		X	X								X								
Bromus sitchensis	Alaska brome	Native	X	X	X			X	X		X	X	X	X	X	X	X	X		X	X	X
Bromus tectorum[1]	cheatgrass	Invasive, Non-Native																		X		
Calamagrostis canadensis	bluejoint	Native																			X	
Carex abrupta	abruptbeak sedge	Native	X	X	X	X	X	X	X	X	X											X
Carex aquatilis	water sedge	Native																X		X	X	X
Carex athrostachya	slenderbeak sedge	Native	X	X	X		X	X	X	X	X		X	X	X	X	X	X		X		X
Carex douglasii	Douglas' sedge	Native		X																X		
Carex filifolia	threadleaf sedge	Native		X	X	X		X	X						X							
Carex fissuricola	cleft sedge	Native		X										X	X							
Carex helleri	Heller's sedge	Native						X														
Carex microptera	smallwing sedge	Native	X													X	X	X				
Carex pachystachya	chamisso sedge	Native				X	X			X		X	X	X	X			X	X	X	X	X
Carex praegracilis	clustered field sedge	Native			X																	
Carex spp.	unknown Carex species	N/A				X	X	X		X						X						X
Carex spectabilis	showy sedge	Native	X	X	X	X		X			X				X							
Carex subfusca	brown sedge	Native	X		X		X		X		X		X		X	X		X		X	X	X
Carex utriculata	Northwest territory sedge	Native																		X		
Carex whitneyi	Whitney's sedge	Native				X		X														
Eleocharis macrostachya	pale spikerush	Native																				X
Eleocharis spp.	unknown Eleocharis species	N/A	X																			
Elymus elymoides	squirreltail	Native	X	X	X	X	X			X	X	X	X	X	X		X	X	X	X	X	X
Elymus glaucus	blue wildrye	Native														X						
Elymus multisetus	big squirreltail	Native											X									
Festuca idahoensis	Idaho fescue	Native					X															
Juncus balticus	mountain rush	Native				X		X	X													
Juncus bufonius	toad rush	Native									X				X							X
Juncus covillei	Coville's rush	Native	X																			
Juncus mertensianus	Mertens' rush	Native					X															
Juncus mexicanus	Mexican rush	Native			X		X			X					X	X		X		X	X	X
Juncus nevadensis	Sierra rush	Native	X		X	X	X		X	X	X				X							
Juncus parryi	Parry's rush	Native	X	X	X	X	X	X			X					X						X
Juncus spp.	unknown Juncus species	N/A			X																	
Juncus xiphioides	irisleaf rush	Native						X												X	X	X
Luzula parviflora	smallflowered woodrush	Native						X	X													
Luzula spicata	spiked woodrush	Native	X																			
Muhlenbergia asperifolia	scratchgrass	Native	X																			
Muhlenbergia filiformis	pullup muhly	Native																		X		
Phleum pratense	timothy grass	Non-Native						X	X		X											
Poaceae	unknown grass species	N/A		X	X			X		X	X											
Poa compressa	Canada bluegrass	Non-Native									X						X	X	X	X		X
Poa cusickii	Cusick's bluegrass	Native																				X
Poa palustris	fowl bluegrass	Non-Native				X			X	X	X			X	X	X	X	X	X	X		X
Poa secunda	Sandberg bluegrass	Native			X	X	X	X							X	X						
Poa stebbinsii	Stebbins' bluegrass	Native														X						
Poa wheeleri	Wheeler's bluegrass	Native	X				X			X	X	X	X	X	X				X	X		X
Stipa comata	needle and thread	Native															X					
Stipa hymenoides	Indian ricegrass	Native																				X

Plant Species Observed			Waugh Lake Transects									Gem Lake Transects						Agnew Lake Transects				
Scientific Name	**Common Name**	**Native Status**	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T7**	**T8**	**T9**	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T1**	**T2**	**T3**	**T4**	**T5**
Stipa occidentalis	western needlegrass	Native	X													X						
Stipa pulchra	purple needlegrass	Native									X										X	X
Trisetum spicatum	spike trisetum	Native	X		X		X	X			X											
Total Graminoid Species by Transect			**18**	**11**	**17**	**13**	**16**	**18**	**12**	**10**	**17**	**4**	**7**	**9**	**15**	**12**	**8**	**12**	**5**	**15**	**11**	**19**
HERBS																						
Ageratina occidentalis	western snakeroot	Native																			X	
Angelica lineariloba	poison angelica	Native										X		X	X				X			
Antennaria corymbosa	flat-top pussytoes	Native	X	X	X																	
Antennaria media	Rocky Mountain pussytoes	Native	X		X	X	X	X	X		X											X
Apocynum androsaemifolium	spreading dogbane	Native										X							X			
Artemisia douglasiana	Douglas' sagewort	Native									X							X		X		
Artemisia dracunculus	tarragon	Native					X						X		X	X	X			X	X	
Arnica nevadensis	Nevada arnica	Native															X					
Boechera paupercula	littleleaf rockcress	Native	X																			
Boechera retrofracta	second rockcress	Native															X					
Boechera spp.	unknown rockcress species	N/A		X			X		X		X	X		X	X		X		X	X		X
Bryophyta	unknown moss species	N/A			X	X		X	X		X		X							X	X	X
Calyptridium umbellatum	pussypaws	Native			X		X															
Castilleja applegatei	wavyleaf Indian paintbrush	Native										X										
Castilleja linariifolia	Wyoming Indian paintbrush	Native										X										
Chamerion angustifolium	fireweed	Native	X	X	X			X					X							X	X	
Chaenactis douglasii	Douglas' dustymaiden	Native																		X		
Cirsium andersonii	rose thistle	Native										X										
Cirsium scariosum	meadow thistle	Native				X																
Cryptantha echinella	prickly cryptantha	Native																		X		
Dieteria canescens	hoary tansyaster	Native												X								
Drymocallis lactea	Nevada cinquefoil	Native				X					X						X			X		X
Epilobium ciliatum	fringed willowherb	Native				X		X	X		X	X	X						X	X	X	X
Erigeron glacialis	subalpine fleabane	Native	X	X				X														
Eriogonum nudum	naked buckwheat	Native										X		X					X	X	X	X
Eriogonum ovalifolium	cushion buckwheat	Native										X		X	X				X	X	X	
Eriogonum umbellatum	sulphur-flower buckwheat	Native															X					
Erysimum capitatum	western wallflower	Native															X					
Erythranthe breweri	Brewer's monkeyflower	Native			X						X											
Erythranthe guttata	seep monkeyflower	Native			X			X	X		X											
Erythranthe lewisii	purple monkeyflower	Native														X						
Fragaria spp.	strawberry species	N/A						X														
Gayophytum diffusum	spreading groundsmoke	Native												X	X			X	X		X	
Geranium richardsonii	Richardson's geranium	Native				X		X														
Gnaphalium palustre	western marsh cudweed	Native											X						X			
Hackelia floribunda	manyflower stickseed	Native															X					
Lichen	unknown lichen species	N/A						X														
Linanthus pungens	granite prickly phlox	Native																		X		
Lonicera involucrata	twinberry honeysuckle	Native																		X		
Lupinus breweri	Brewer's lupine	Native			X		X				X											
Lupinus lepidus	Pacific lupine	Native						X														
Maianthemum stellatum	starry false lily of the valley	Native																X			X	
Marchantiophyta	unknown liverwort species	N/A																		X	X	
Mentzelia laevicaulis	smoothstem blazingstar	Native																X				
Monardella odoratissima	mountain monardella	Native					X				X	X					X			X		
Oenothera elata	Hooker's evening-primrose	Native																				X

Plant Species Observed			Waugh Lake Transects									Gem Lake Transects						Agnew Lake Transects				
Scientific Name	**Common Name**	**Native Status**	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T7**	**T8**	**T9**	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T1**	**T2**	**T3**	**T4**	**T5**
Oxyria digyna	alpine mountainsorrel	Native		X	X	X															X	
Pellaea breweri	Brewer's cliffbrake	Native				X			X													
Penstemon heterodoxus	Sierra beardtongue	Native	X	X																		
Penstemon newberryi	mountain pride	Native			X		X			X					X							X
Penstemon rostriflorus	Bridge penstemon	Native					X				X	X						X	X	X		X
Penstemon spp.	unknown penstemon species	N/A				X																
Perideridia parishii	Parish's yampah	Native						X														
Phacelia hastata	silverleaf phacelia	Native									X	X	X	X	X		X	X		X		
Phyllodoce breweri	purple mountain heather	Native						X														
Polygonum douglasii	Douglas' knotweed	Native													X							
Potentilla breweri	Brewer's cinquefoil	Native	X																			
Primula spp.	shootingstar species	N/A			X																	
Pteridium aquilinum	western brackenfern	Native				X											X					
Pyrola asarifolia	liverleaf wintergreen	Native							X													
Rorippa curvipes	bluntleaf yellowcress	Native		X				X			X		X	X	X		X					
Rorippa curvisiliqua	curvepod yellowcress	Native											X									
Rumex salicifolius	willow dock	Native											X	X	X							X
Sedum obtusatum	Sierra stonecrop	Native																				X
Selaginella spp.	unknown Selaginella moss species	N/A		X	X	X		X	X											X		
Senecio aronicoides	rayless ragwort	Native	X				X															
Senecio triangularis	arrowleaf ragwort	Native						X														
Stephanomeria tenuifolia	narrowleaf wirelettuce	Native										X										
Streptanthus tortuosus	mountain jewelflower	Native				X	X		X										X			
Thalictrum fendleri	Fendler's meadow rue	Native				X					X		X	X						X	X	
Trifolium microcephalum	smallhead clover	Native											X									
Trifolium spp.	clover species	N/A											X									
Verbascum thapsus[2]	woolly mullein	Invasive, Non-Native																X		X	X	
Veronica peregrina	neckweed	Native				X	X								X		X			X		
Total Herb Species by Transect			**8**	**8**	**12**	**15**	**11**	**15**	**10**	**1**	**16**	**13**	**12**	**10**	**12**	**2**	**13**	**7**	**10**	**21**	**13**	**11**
SHRUBS																						
Artemisia arbuscula	little sagebrush	Native										X		X				X	X	X	X	X
Ceanothus velutinus	snowbrush	Native																X	X		X	
Cercocarpus ledifolius	curl-leaf mountain mahogany	Native																X	X			
Cornus sericea	American dogwood	Native																	X			
Dasiphora fruticosa	shrubby cinquefoil	Native													X		X					
Ericameria nauseosa	rubber rabbitbrush	Native											X	X				X				
Ericameria spp.	unknown rabbitbrush species	N/A																		X		
Frangula rubra	red buckthorn	Native												X	X	X						X
Holodiscus discolor	oceanspray	Native					X								X	X						X
Prunus emarginata	bitter cherry	Native																	X			
Rhododendron columbianum	Labrador tea	Native						X														
Ribes cereum	wax currant	Native										X						X	X	X		X
Ribes montigenum	gooseberry currant	Native	X	X												X	X			X		
Rosa woodsii	Woods' rose	Native																	X			
Salix exigua	narrowleaf willow	Native						X	X				X		X			X	X	X	X	X
Salix geyeriana	Geyer's willow	Native						X	X						X							
Salix gooddingii	Goodding's willow	Native											X								X	
Salix lasiolepis	arroyo willow	Native						X							X	X	X	X	X	X	X	X
Salix lemmonii	Lemmon's willow	Native								X			X		X	X	X					
Salix lutea	yellow willow	Native	X	X	X	X		X	X	X			X		X	X	X			X		X
Salix orestera	Sierra willow	Native						X					X		X			X	X	X	X	X

Plant Species Observed			Waugh Lake Transects									Gem Lake Transects						Agnew Lake Transects				
Scientific Name	**Common Name**	**Native Status**	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T7**	**T8**	**T9**	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T1**	**T2**	**T3**	**T4**	**T5**
Salix spp.	unknown willow species	N/A				X		X			X											
Sambucus racemosa	red elderberry	Native															X					
Symphoricarpos rotundiflorus	roundleaf snowberry	Native											X			X		X		X		X
Total Shrub Species by Transect			**2**	**2**	**1**	**2**	**1**	**7**	**3**	**2**	**1**	**2**	**7**	**3**	**9**	**8**	**6**	**9**	**10**	**9**	**6**	**9**
TREES																						
Pinus albicaulis[3]	whitebark pine	Native		X				X	X							X				X		
Pinus contorta ssp. *murrayana*	lodgepole pine	Native	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X		X	X
Pinus jeffreyi	Jeffrey pine	Native																				X
Pinus spp. (5-needle)[4]	unknown 5-needle pine species	N/A								X												
Populus tremuloides	quaking aspen	Native										X	X	X	X		X	X	X		X	X
Tsuga mertensiana	mountain hemlock	Native		X					X							X	X					
Total Tree Species by Transect			**1**	**3**	**1**	**0**	**1**	**2**	**3**	**2**	**1**	**2**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**1**	**2**	**3**

[1] *Bromus tectorum* (cheatgrass) is an Inyo National Forest Invasive Plant Species listed at Treatment Strategy Level 3 (Contain).
[2] *Verbascum thapsus* (woolly mullein) is Inyo National Forest Invasive Plant Species listed at Treatment Strategy Level 4 (Limited or No Treatment).
[3] *Pinus albicaulis* (whitebark pine) is listed as threatened under the Endangered Species Act. Note that this species was only observed in plots above the historic OHWM of the reservoir. Refer to Section 6.2 for more information about whitebark pine in the Rush Creek Project study area.
[4] Five-needle pines that could not be identified to the species level were mapped as part of the special-status plant mapping effort (refer to Section 5.2 for more information).

APPENDIX L

Species Observed on Transects within the Historic Inundation Zone of Project Reservoirs

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Plant Species Observed			Waugh Lake Transects									Gem Lake Transects						Agnew Lake Transects				
Scientific Name	**Common Name**	**Native Status**	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T7**	**T8**	**T9**	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T1**	**T2**	**T3**	**T4**	**T5**
GRAMINOIDS																						
Agrostis idahoensis	Idaho bentgrass	Native			X		X	X	X											X	X	
Agrostis scabra	rough bentgrass	Native	X	X			X	X	X		X			X	X		X	X				X
Agrostis variabilis	mountain redtop	Native	X		X	X								X								
Bromus sitchensis	Alaska brome	Native	X	X	X			X	X		X	X	X	X	X	X	X	X		X	X	X
Bromus tectorum[1]	cheatgrass	Invasive, Non-Native																		X		
Calamagrostis canadensis	bluejoint	Native																			X	
Carex abrupta	abruptbeak sedge	Native	X	X	X	X	X	X	X	X	X											X
Carex aquatilis	water sedge	Native																X		X	X	X
Carex athrostachya	slenderbeak sedge	Native	X	X	X		X	X	X	X	X		X	X	X	X	X	X		X		X
Carex douglasii	Douglas' sedge	Native		X																X		
Carex filifolia	threadleaf sedge	Native		X	X	X		X	X						X							
Carex fissuricola	cleft sedge	Native		X										X	X							
Carex helleri	Heller's sedge	Native						X														
Carex microptera	smallwing sedge	Native	X													X	X	X				
Carex pachystachya	chamisso sedge	Native				X	X			X		X	X	X	X			X	X	X	X	X
Carex praegracilis	clustered field sedge	Native			X																	
Carex spp.	unknown Carex species	N/A				X	X	X		X						X						X
Carex spectabilis	showy sedge	Native	X	X	X	X		X			X				X							
Carex subfusca	brown sedge	Native	X		X		X		X		X		X		X	X		X		X	X	X
Carex utriculata	Northwest territory sedge	Native																		X		
Carex whitneyi	Whitney's sedge	Native				X		X														
Eleocharis macrostachya	pale spikerush	Native																				X
Eleocharis spp.	unknown Eleocharis species	N/A	X																			
Elymus elymoides	squirreltail	Native	X	X	X	X	X			X	X	X	X	X	X		X	X	X	X	X	X
Elymus glaucus	blue wildrye	Native														X						
Elymus multisetus	big squirreltail	Native											X									
Festuca idahoensis	Idaho fescue	Native					X															
Juncus balticus	mountain rush	Native				X		X	X													
Juncus bufonius	toad rush	Native									X				X							X
Juncus covillei	Coville's rush	Native	X																			
Juncus mertensianus	Mertens' rush	Native					X															
Juncus mexicanus	Mexican rush	Native			X		X			X					X	X		X		X	X	X
Juncus nevadensis	Sierra rush	Native	X		X	X	X		X	X	X				X							
Juncus parryi	Parry's rush	Native	X	X	X	X	X	X			X					X						X
Juncus spp.	unknown Juncus species	N/A			X																	
Juncus xiphioides	irisleaf rush	Native						X												X	X	X
Luzula parviflora	smallflowered woodrush	Native						X	X													
Luzula spicata	spiked woodrush	Native	X																			
Muhlenbergia asperifolia	scratchgrass	Native	X																			
Muhlenbergia filiformis	pullup muhly	Native																		X		
Phleum pratense	timothy grass	Non-Native						X	X		X											
Poaceae	unknown grass species	N/A		X	X			X		X	X											
Poa compressa	Canada bluegrass	Non-Native									X						X	X	X	X		X
Poa cusickii	Cusick's bluegrass	Native																				X
Poa palustris	fowl bluegrass	Non-Native				X			X	X	X			X	X	X	X	X	X	X		X
Poa secunda	Sandberg bluegrass	Native			X	X	X	X							X	X						
Poa stebbinsii	Stebbins' bluegrass	Native														X						
Poa wheeleri	Wheeler's bluegrass	Native	X				X			X	X	X	X	X	X				X	X		X
Stipa comata	needle and thread	Native															X					
Stipa hymenoides	Indian ricegrass	Native																				X

Plant Species Observed			Waugh Lake Transects									Gem Lake Transects						Agnew Lake Transects				
Scientific Name	**Common Name**	**Native Status**	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T7**	**T8**	**T9**	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T1**	**T2**	**T3**	**T4**	**T5**
Stipa occidentalis	western needlegrass	Native	X													X						
Stipa pulchra	purple needlegrass	Native									X										X	X
Trisetum spicatum	spike trisetum	Native	X		X		X	X			X											
Total Graminoid Species by Transect			**18**	**11**	**17**	**13**	**16**	**18**	**12**	**10**	**17**	**4**	**7**	**9**	**15**	**12**	**8**	**12**	**5**	**15**	**11**	**19**
HERBS																						
Ageratina occidentalis	western snakeroot	Native																			X	
Angelica lineariloba	poison angelica	Native										X		X	X				X			
Antennaria corymbosa	flat-top pussytoes	Native	X	X	X																	
Antennaria media	Rocky Mountain pussytoes	Native	X		X	X	X	X	X		X											X
Apocynum androsaemifolium	spreading dogbane	Native										X							X			
Artemisia douglasiana	Douglas' sagewort	Native									X							X		X		
Artemisia dracunculus	tarragon	Native					X						X		X	X	X			X	X	
Arnica nevadensis	Nevada arnica	Native															X					
Boechera paupercula	littleleaf rockcress	Native	X																			
Boechera retrofracta	second rockcress	Native															X					
Boechera spp.	unknown rockcress species	N/A		X			X		X		X	X		X	X		X		X	X		X
Bryophyta	unknown moss species	N/A			X	X		X	X		X		X							X	X	X
Calyptridium umbellatum	pussypaws	Native			X		X															
Castilleja applegatei	wavyleaf Indian paintbrush	Native										X										
Castilleja linariifolia	Wyoming Indian paintbrush	Native										X										
Chamerion angustifolium	fireweed	Native	X	X	X			X					X							X	X	
Chaenactis douglasii	Douglas' dustymaiden	Native																		X		
Cirsium andersonii	rose thistle	Native										X										
Cirsium scariosum	meadow thistle	Native				X																
Cryptantha echinella	prickly cryptantha	Native																		X		
Dieteria canescens	hoary tansyaster	Native												X								
Drymocallis lactea	Nevada cinquefoil	Native				X					X						X			X		X
Epilobium ciliatum	fringed willowherb	Native				X		X	X		X	X	X						X	X	X	X
Erigeron glacialis	subalpine fleabane	Native	X	X				X														
Eriogonum nudum	naked buckwheat	Native										X		X					X	X	X	X
Eriogonum ovalifolium	cushion buckwheat	Native										X		X	X				X	X	X	
Eriogonum umbellatum	sulphur-flower buckwheat	Native															X					
Erysimum capitatum	western wallflower	Native															X					
Erythranthe breweri	Brewer's monkeyflower	Native			X						X											
Erythranthe guttata	seep monkeyflower	Native			X			X	X		X											
Erythranthe lewisii	purple monkeyflower	Native														X						
Fragaria spp.	strawberry species	N/A						X														
Gayophytum diffusum	spreading groundsmoke	Native												X	X			X	X		X	
Geranium richardsonii	Richardson's geranium	Native				X		X														
Gnaphalium palustre	western marsh cudweed	Native											X						X			
Hackelia floribunda	manyflower stickseed	Native															X					
Lichen	unknown lichen species	N/A						X														
Linanthus pungens	granite prickly phlox	Native																		X		
Lonicera involucrata	twinberry honeysuckle	Native																		X		
Lupinus breweri	Brewer's lupine	Native			X		X				X											
Lupinus lepidus	Pacific lupine	Native						X														
Maianthemum stellatum	starry false lily of the valley	Native																X			X	
Marchantiophyta	unknown liverwort species	N/A																		X	X	
Mentzelia laevicaulis	smoothstem blazingstar	Native																X				
Monardella odoratissima	mountain monardella	Native					X				X	X					X			X		
Oenothera elata	Hooker's evening-primrose	Native																				X

Plant Species Observed			Waugh Lake Transects									Gem Lake Transects						Agnew Lake Transects				
Scientific Name	**Common Name**	**Native Status**	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T7**	**T8**	**T9**	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T1**	**T2**	**T3**	**T4**	**T5**
Oxyria digyna	alpine mountainsorrel	Native		X	X	X															X	
Pellaea breweri	Brewer's cliffbrake	Native				X			X													
Penstemon heterodoxus	Sierra beardtongue	Native	X	X																		
Penstemon newberryi	mountain pride	Native			X		X			X					X							X
Penstemon rostriflorus	Bridge penstemon	Native					X				X	X						X	X	X		X
Penstemon spp.	unknown penstemon species	N/A				X																
Perideridia parishii	Parish's yampah	Native						X														
Phacelia hastata	silverleaf phacelia	Native									X	X	X	X	X		X	X		X		
Phyllodoce breweri	purple mountain heather	Native						X														
Polygonum douglasii	Douglas' knotweed	Native													X							
Potentilla breweri	Brewer's cinquefoil	Native	X																			
Primula spp.	shootingstar species	N/A			X																	
Pteridium aquilinum	western brackenfern	Native				X											X					
Pyrola asarifolia	liverleaf wintergreen	Native							X													
Rorippa curvipes	bluntleaf yellowcress	Native		X				X			X		X	X	X		X					
Rorippa curvisiliqua	curvepod yellowcress	Native											X									
Rumex salicifolius	willow dock	Native											X	X	X							X
Sedum obtusatum	Sierra stonecrop	Native																				X
Selaginella spp.	unknown Selaginella moss species	N/A		X	X	X		X	X											X		
Senecio aronicoides	rayless ragwort	Native	X				X															
Senecio triangularis	arrowleaf ragwort	Native						X														
Stephanomeria tenuifolia	narrowleaf wirelettuce	Native										X										
Streptanthus tortuosus	mountain jewelflower	Native				X	X		X										X			
Thalictrum fendleri	Fendler's meadow rue	Native				X					X		X	X						X	X	
Trifolium microcephalum	smallhead clover	Native											X									
Trifolium spp.	clover species	N/A											X									
Verbascum thapsus[2]	woolly mullein	Invasive, Non-Native																X		X	X	
Veronica peregrina	neckweed	Native				X	X								X		X			X		
Total Herb Species by Transect			**8**	**8**	**12**	**15**	**11**	**15**	**10**	**1**	**16**	**13**	**12**	**10**	**12**	**2**	**13**	**7**	**10**	**21**	**13**	**11**
SHRUBS																						
Artemisia arbuscula	little sagebrush	Native										X		X				X	X	X	X	X
Ceanothus velutinus	snowbrush	Native																X	X		X	
Cercocarpus ledifolius	curl-leaf mountain mahogany	Native																X	X			
Cornus sericea	American dogwood	Native																	X			
Dasiphora fruticosa	shrubby cinquefoil	Native													X		X					
Ericameria nauseosa	rubber rabbitbrush	Native											X	X				X				
Ericameria spp.	unknown rabbitbrush species	N/A																		X		
Frangula rubra	red buckthorn	Native												X	X	X						X
Holodiscus discolor	oceanspray	Native					X								X	X						X
Prunus emarginata	bitter cherry	Native																	X			
Rhododendron columbianum	Labrador tea	Native						X														
Ribes cereum	wax currant	Native										X						X	X	X		X
Ribes montigenum	gooseberry currant	Native	X	X												X	X			X		
Rosa woodsii	Woods' rose	Native																	X			
Salix exigua	narrowleaf willow	Native						X	X				X		X			X	X	X	X	X
Salix geyeriana	Geyer's willow	Native						X	X						X							
Salix gooddingii	Goodding's willow	Native											X								X	
Salix lasiolepis	arroyo willow	Native						X							X	X	X	X	X	X	X	X
Salix lemmonii	Lemmon's willow	Native								X			X		X	X	X					
Salix lutea	yellow willow	Native	X	X	X	X		X	X	X			X		X	X	X			X		X
Salix orestera	Sierra willow	Native						X					X		X			X	X	X	X	X

Plant Species Observed			Waugh Lake Transects									Gem Lake Transects						Agnew Lake Transects				
Scientific Name	**Common Name**	**Native Status**	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T7**	**T8**	**T9**	**T1**	**T2**	**T3**	**T4**	**T5**	**T6**	**T1**	**T2**	**T3**	**T4**	**T5**
Salix spp.	unknown willow species	N/A				X		X			X											
Sambucus racemosa	red elderberry	Native															X					
Symphoricarpos rotundiflorus	roundleaf snowberry	Native											X			X		X		X		X
Total Shrub Species by Transect			**2**	**2**	**1**	**2**	**1**	**7**	**3**	**2**	**1**	**2**	**7**	**3**	**9**	**8**	**6**	**9**	**10**	**9**	**6**	**9**
TREES																						
Pinus albicaulis[3]	whitebark pine	Native		X				X	X							X				X		
Pinus contorta ssp. *murrayana*	lodgepole pine	Native	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X		X	X
Pinus jeffreyi	Jeffrey pine	Native																				X
Pinus spp. (5-needle)[4]	unknown 5-needle pine species	N/A								X												
Populus tremuloides	quaking aspen	Native										X	X	X	X		X	X	X		X	X
Tsuga mertensiana	mountain hemlock	Native		X					X							X	X					
Total Tree Species by Transect			**1**	**3**	**1**	**0**	**1**	**2**	**3**	**2**	**1**	**2**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**1**	**2**	**3**

[1] *Bromus tectorum* (cheatgrass) is an Inyo National Forest Invasive Plant Species listed at Treatment Strategy Level 3 (Contain).

[2] *Verbascum thapsus* (woolly mullein) is Inyo National Forest Invasive Plant Species listed at Treatment Strategy Level 4 (Limited or No Treatment).

[3] *Pinus albicaulis* (whitebark pine) is listed as threatened under the Endangered Species Act. Note that this species was only observed in plots above the historic OHWM of the reservoir. Refer to Section 6.2 for more information about whitebark pine in the Rush Creek Project study area.

[4] Five-needle pines that could not be identified to the species level were mapped as part of the special-status plant mapping effort (refer to Section 5.2 for more information).

APPENDIX M
Representative Photographs of Riparian Sampling Sites

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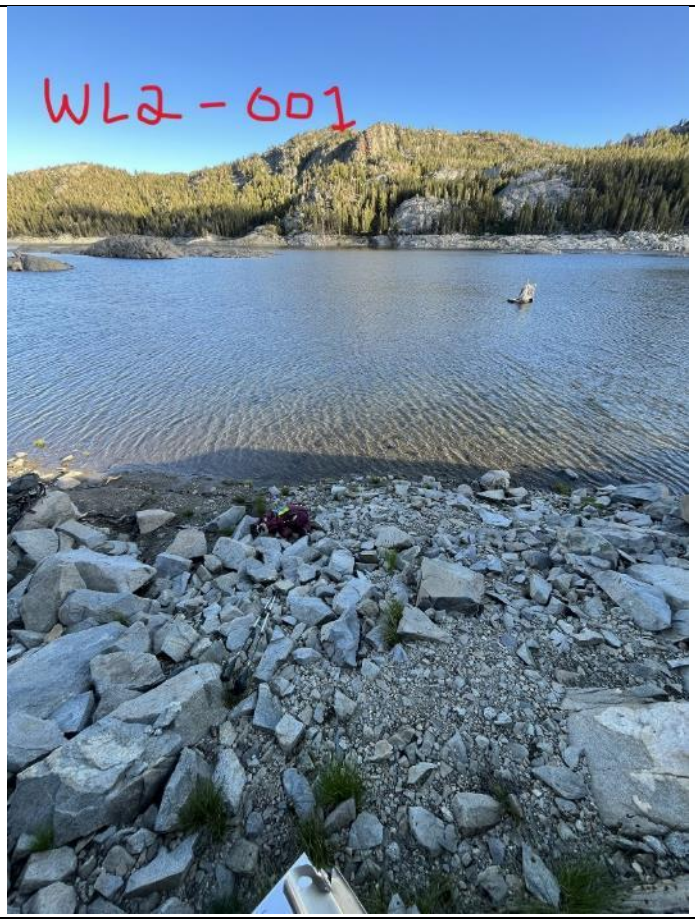


Photo 1: Representative photograph of a sampling plot at Waugh Lake.



Photo 2: Representative photograph of a sampling plot at Rush Creek Below Agnew Dam.



Photo 3: Representative photograph of a sampling plot at Rush Creek Above Silver Lake (River Mile 17.55).



Photo 4: Representative photograph of a sampling plot at Rush Creek Above Silver Lake (River Mile 17.05).



Photo 5: Representative photograph of a sampling plot at Rush Creek Below Silver Lake.



Photo 6: Representative photograph of a sampling plot at South Rush Creek.

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APPENDIX N

Summary Metrics of Graminoids, Herbs, Shrubs, and Trees on Botanical Transects within the Historic Inundation Zones of Project Reservoirs

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Transect Number	Plot Number	Plot Placement	Graminoids		Herbs		Shrubs			Trees	
			Total Percent Cover	Total No. of Individuals	Total Percent Cover	Total No. of Individuals	Total Percent Cover	Total No. of Individuals	Total No. of Stems	Total Percent Cover	Total No. of Individuals
WAUGH LAKE TRANSECTS											
Transect 1											
1	1	Waterline	5	27	<1	7	0	0	0	0	0
1	2	Mid	40	87	<1	3	5	1	32	1	12
1	3	Mid	24	81	5	48	0	0	0	1	14
Inundation Zone Average			**23**	**65**	**1.7**	**19.3**	**1.7**	**0.3**	**10.7**	**0.7**	**8.7**
1	4	Above OHWM	52	240	9	86	55	3	227	1	1
Transect 2											
2	1	Waterline	2	31	<1	2	0	0	0	0	0
2	2	Mid	4	36	1	11	2	3	24	15	56
Inundation Zone Average			**3**	**33.5**	**0.5**	**6.5**	**1**	**1.5**	**12**	**7.5**	**28**
2	3	Above OHWM	1	60	28	535	40	56	84	31	16
Transect 3											
3	1	Waterline	188	1,162	4	247	<1	3	3	0	0
3	2	Mid	74	1,118	28	535	0	0	0	20	30
Inundation Zone Average			**131**	**1,140**	**16**	**391**	**0**	**1.5**	**1.5**	**10**	**15**
3	3	Above OWHM	3	44	2	20	0	0	0	30	3
Transect 4											
4	1	Waterline	5	42	40	360	<1	1	1	0	0
4	2	Mid	10	87	7	35	0	0	0	0	0
Inundation Zone Average			**7.5**	**64.5**	**23.5**	**197.5**	**0**	**0.5**	**0.5**	**0**	**0**
4	3	Above OWHM	6	29	21	168	40	9	560	0	0
Transect 5											
5	1	Waterline	30	352	2	119	0	0	0	1	7
5	2	Mid	7	35	7	89	0	0	0	15	37
Inundation Zone Average			**18.5**	**387**	**4.5**	**104**	**0**	**0**	**0**	**8**	**22**
5	3	Above OHWM	5	78	9	45	3	8	8	60	5
Transect 6											
6	1	Waterline	10	48	1	5	<1	1	1	0	0
6	2	Mid	107	5,195	6	291	4	9	39	25	188
6	3	Mid	85	1,111	84	1,136	20	79	367	50	129
Inundation Zone Average			**67.3**	**2,118**	**30.3**	**477.3**	**8**	**29.7**	**135.7**	**25**	**105.7**
6	4	Above OHWM	21	61	59	380	45	47	505	3	1
Transect 7											
7	1	Waterline	7	38	0	0	0	0	0	0	0
7	2	Mid	2	23	0	0	0	0	0	<1	1
7	3	Mid	38	351	45	631	6	9	36	10	72

Transect Number	Plot Number	Plot Placement	Graminoids		Herbs		Shrubs			Trees	
			Total Percent Cover	Total No. of Individuals	Total Percent Cover	Total No. of Individuals	Total Percent Cover	Total No. of Individuals	Total No. of Stems	Total Percent Cover	Total No. of Individuals
Inundation Zone Average			**15.7**	**137.3**	**15**	**210.3**	**2**	**3**	**12**	**3.3**	**24.3**
7	4	Above OHWM	12	156	24	841	10	2	27	17	7
Transect 8											
8	1	Waterline	9	59	0	0	0	0	0	0	0
8	2	Mid	5	28	2	6	<1	1	3	2	8
Inundation Zone Average			**7**	**43.5**	**1**	**3**	**0**	**0.5**	**1.5**	**1**	**4**
8	3	Above OHWM	1	8	2	6	20	1	30	50	15
Transect 9											
9	1	Waterline	49	476	43	1,050	0	0	0	0	0
9	2	Mid	11	77	10	79	15	1	11	<1	1
9	3	Mid	8	40	12	96	5	1	14	3	3
Inundation Zone Average			**22.7**	**197.7**	**21.7**	**408.3**	**6.7**	**0.7**	**8.3**	**1**	**1.3**
9	4	Above OHWM	10	100	3	104	0	0	0	100	11
GEM LAKE TRANSECTS											
Transect 1											
1	1	Waterline	21	137	3	19	0	0	0	1	4
1	2	Mid	3	50	7	24	3	14	24	9	26
Inundation Zone Average			**12**	**93.5**	**5**	**21.5**	**1.5**	**7**	**12**	**5**	**15**
1	3	Above OWHM	4	55	11	104	12	19	50	45	10
Transect 2											
2	1	Waterline	63	493	4	63	2	2	17	<1	2
2	2	Mid	15	304	10	1,566	6	16	58	2	16
Inundation Zone Average			**39**	**398.5**	**7**	**814.5**	**4**	**9**	**37.5**	**1**	**9**
2	3	Above OWHM	1	12	14	85	55	7	51	97	4
Transect 3											
3	1	Waterline	7	61	4	215	1	2	3	0	0
3	2	Mid	1	20	16	91	2	4	47	7	17
Inundation Zone Average			**4**	**40.5**	**10**	**153**	**1.5**	**3**	**25**	**3.5**	**8.5**
3	3	Above OWHM	18	166	1	13	20	24	106	40	12
Transect 4											
4	1	Waterline	66	1,298	10	293	0	0	0	0	0
4	2	Mid	5	52	4	54	33	15	131	1	5
4	3	Mid	5	48	40	208	3	3	11	25	25
Inundation Zone Average			**25.3**	**466**	**18**	**185**	**12**	**6**	**47.3**	**8.7**	**10**
4	4	Above OHWM	<1	10	0	0	90	7	36	155	42

Transect Number	Plot Number	Plot Placement	Graminoids		Herbs		Shrubs			Trees	
			Total Percent Cover	Total No. of Individuals	Total Percent Cover	Total No. of Individuals	Total Percent Cover	Total No. of Individuals	Total No. of Stems	Total Percent Cover	Total No. of Individuals
Transect 5											
5	1	Waterline	30	1,452	0	0	25	1	13	1	8
5	2	Mid	3	17	<1	3	10	2	17	3	16
5	3	Mid	3	72	1	1	13	17	132	60	52
Inundation Zone Average			**12**	**513.7**	**0.3**	**1.3**	**16**	**6.7**	**54**	**21.3**	**25.3**
5	4	Above OHWM	32	82	0	0	3	6	6	45	21
Transect 6											
6	1	Waterline	2	43	1	34	0	0	0	0	0
6	2	Mid	6	53	8	16	11	3	27	5	8
6	3	Mid	2	16	9	27	4	3	26	6	14
Inundation Zone Average			**3.3**	**37.3**	**6**	**25.7**	**5**	**2**	**17.7**	**3.7**	**7.3**
6	4	Above OHWM	4	19	13	63	102	9	301	0	0
AGNEW LAKE TRANSECTS											
Transect 1											
1	1	Waterline	104	4,583	0	0	65	12	72	0	0
1	2	Mid	17	134	15	35	35	16	91	<1	1
Inundation Zone Average			**60.5**	**2,358.5**	**7.5**	**17.5**	**50**	**14**	**81.5**	**0**	**0.5**
1	3	Above OHWM	1	5	1	16	41	19	50	95	31
Transect 2											
2	1	Waterline	59	1,675	2	52	83	30	116	1	3
2	2	Mid	<1	4	8	17	12	15	53	0	0
Inundation Zone Average			**29.5**	**839.5**	**5**	**34.5**	**47.5**	**22.5**	**84.5**	**0.5**	**1.5**
2	3	Above OHWM	1	7	11	55	60	20	88	0	0
Transect 3											
3	1	Waterline	103	11,505	2	100	5	7	44	0	0
3	2	Mid	82	7,344	2	150	115	32	142	0	0
3	3	Mid	10	89	18	170	10	9	71	0	0
Inundation Zone Average			**65**	**6,312.7**	**7.3**	**140**	**43.3**	**48**	**85.7**	**0**	**0**
3	4	Above OHWM	1	11	6	38	113	28	138	4	2
Transect 4											
4	1	Waterline	106	10,103	15	706	88	28	112	0	0
4	2	Mid	87	984	8	150	20	19	79	<1	1
Inundation Zone Average			**96.5**	**5,543.5**	**11.5**	**428**	**54**	**23.5**	**95.5**	**0**	**0.5**
4	3	Above OHWM	3	16	122	635	0	0	0	100	72

Transect Number	Plot Number	Plot Placement	Graminoids		Herbs		Shrubs			Trees	
			Total Percent Cover	Total No. of Individuals	Total Percent Cover	Total No. of Individuals	Total Percent Cover	Total No. of Individuals	Total No. of Stems	Total Percent Cover	Total No. of Individuals
Transect 5											
5	1	Waterline	27	592	61	1,101	14	44	80	0	0
5	2	Mid	29	95	61	1,504	4	6	12	7	11
Inundation Zone Average			**28**	**343.5**	**61**	**1,302.5**	**9**	**25**	**46**	**3.5**	**5.5**
5	3	Above OHWM	1	9	32	57	9	15	41	8	5

APPENDIX O
Riparian Vegetation Processes Overview

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Appendix O – Riparian Vegetation Processes Overview

Riparian Vegetation Processes Overview

The patterns of riparian vegetation establishment and distribution along a river are created by the interaction of physical processes (e.g., flows of varying magnitudes, timing of flows, flow recession rates, flow and depth to water table variability, and sediment deposition) and the different life history characteristics of the dominant species (Stella et al. 2013; Merritt et al. 2009; Schmidt and Potyondy 2004; Harris 1987). The dominant woody riparian species present along the Project's stream reaches have many life history adaptations that promote their success under dynamic and episodic, yet seasonally predictable, hydrologic conditions.

In general, riparian areas are the most productive and diverse parts of Sierra Nevada landscapes (Kattelmann and Embury 1996). The cooler microclimates and higher soil moisture along streams are favorable for plant growth to be sustained for longer periods each year than surrounding uplands. The frequent disturbance by floods and associated sediment transport promotes a much greater diversity of species than on surrounding upland hillslopes (Kattelmann and Embury 1996). Frequent disturbance creates riparian vegetation with patchy distributions of species and ages (Kattelmann and Embury 1996).

The interaction of average streamflow versus the groundwater levels are particularly important factors for the maintenance of riparian vegetation in the Eastern Sierra (Kondolf et al. 1987, Stromberg and Patten 1990). In particular, there are strong patterns in riparian vegetation between streams that gain water from groundwater versus lose water to groundwater over the growing season (Kondolf et al. 1987). In streams with highly permeable alluvial fans, average flow is more important to the maintenance of riparian vegetation because these streams lose water quickly after the period of snowmelt (Kondolf et al. 1987), and riparian vegetation in losing streams appear to be more sensitive to diversions of water (Stomberg and Patten 1989, 1990).

Riparian studies on eastern Sierra Nevada systems indicate that stream valley geomorphology is a very strong predictor of the types of riparian vegetation and the width of the riparian corridor (Harris 1988, Kondolf et al. 1987). The extreme topographic relief of the Eastern Sierra and the corresponding shift in vegetation communities create conditions where the riparian corridor receives all the runoff from snowmelt. Riparian vegetation proceeds downslope as narrow strips of vegetation surrounded by more semiarid scrublands. The average flow in the stream, the gradient, and the degree of channel incision are strong predictors of the width of the riparian strip (Kondolf et al. 1987). The width of the riparian corridor is most closely correlated with floodplain width, which is generally greater in valleys underlain by glacial till and on alluvial fans than stream valleys underlain by shallow bedrock (Jones and Stokes Associates 1985). Riparian species assemblages also have strong associations with the stream valley type, substrate, and stream elevation (Harris 1988).

There are two main riparian systems present in the Rush Creek Project area, including streamside riparian and meadow riparian systems. Each type of system is described more fully below.

Streamside Riparian Systems

Many stream reaches in the higher elevations of the Sierra Nevada are confined within relatively narrow bedrock canyons, with similarly narrow riparian corridors (Harris 1987, Kattelman and Embury 1996). Such riparian areas often do not have precise boundaries because of temporal fluctuations of stream levels and intermixing of upland vegetation types from surrounding hillslopes. During most of the year, riparian areas are separate from the adjacent stream, but during periods of high water, riparian vegetation growing on the lower floodplains become part of the stream. Because of this seasonal inundation, riparian communities often exhibit a change in species composition along with the topography of the bank. Species that require frequent inundation tend to be found in areas with high soil moisture immediately adjacent to the streambank, and species that are more tolerant of seasonal drying are found on surrounding terraces and slopes.

High magnitude, infrequent flow events (scouring flows) maintain the channel by scouring banks and the channel bed, and are important for maintaining channel complexity and species diversity. These events create areas for new colonization by riparian species and maintain the compositional and structural diversity of the riparian community. The scouring flows are also important for limiting encroachment of riparian vegetation into the channel by scouring vegetation along the channel margins, which reduces the potential for berm development and channel narrowing. Riparian species can also readily reproduce vegetatively from downed or abraded limbs and trunks and root sprouts, as well as twig or root pieces deposited during a high flow event, which enables these species to rapidly re-establish following scouring flood events. Substrate type can be a strong predictor of scouring, which in turn affects the riparian species composition. For example, Harris (1987) that flood damage tended to be most severe on braided floodplains with relatively unstable gravel substrates, and willows (*Salix* spp.) were more common on such substates. Sand and cobble substrates on incised stream channels, in contrast, tended to be dominated by lodgepole pine (Harris 1987). Alternately, thick growth of riparian vegetation on streambanks can also make the channel edges more resistant to erosion.

Meadow Riparian Systems

In areas with deep glacial valleys, channels may meander and form multiple channels across a broad area, with meadows forming in the floodplains. During periods of high runoff, water spreads over the floodplain and infiltrates the upper portions of streambanks, thereby raising the water table (Kattelmann and Embury 1996). In meadow systems, water on the banks then slowly returns to the channel as the streamflow declines over the course of the summer. In this way, meadow systems can maintain streamflows during otherwise low-flow periods of the hydrograph. Meadow systems create a distinct riparian community dominated by herbaceous vegetation such as sedges, rushes, grasses, and broad-leaved forbs. Woody riparian vegetation is typically scattered. Poorly drained sites

may create wet meadows that have standing water for the majority of the growing season, while well-drained loamy soils are saturated seasonally (Kattelmann and Embury 1996).

Life History Requirements of Dominant Woody Riparian Species

The magnitude, timing, and flow recession of spring flows (recruitment flows) are important determinants of successful regeneration and establishment of riparian species. For successful recruitment to occur, flows that coincide with the release of seeds with suitable recession rates are necessary in order to provide sufficient moisture to the seedlings and sprouts. This hydrology may occur in the same year as the scouring flow or may occur several years later (Karrenberg et al. 2002, Merritt et al. 2009; Stella et al. 2013).

Willows, which are dominant along Project-affected stream segments, release seeds in the spring and early summer, timed with the natural snowmelt hydrograph. These seeds are only viable for a short period of time (weeks), requiring suitable moisture and soil conditions to be present at the time of seed release. For seedlings to survive, the flow recession rates must be slow and groundwater must be available through the dry summer. Recession rates from the summer flows cannot exceed the root growth rates of the seedlings. Results from studies from the literature indicate that seedlings typically survive down ramping rates that range from 0.4 to 1.6 inches per day. Seedlings can survive down ramping rates of up to 3.9 inches per day, depending on various factors such as species, substrate characteristics, and other sources of water (e.g., seeps, hillslope runoff, precipitation) (Amlin and Rood 2002; Shafroth et al. 2017). Seedlings that establish too close to the channel where late summer and fall water is available are more susceptible to scouring and uprooting by subsequent high winter or spring flows. As a result, riparian vegetation often establishes in elevation zones where water is available during the drier months, but not too close to the base flow (summer and fall) channel where it is susceptible to damage by higher flows.

Life history strategies of the common woody riparian species found along the Project-affected stream segments are summarized in Tables N-1 (for willow species) and Table N-2 (for other species). The timing of seed dispersal for these species is summarized in Table N-3. Flowering and seed dispersal generally occurs in May through July, but is heavily dependent on the timing of snowmelt, especially at higher elevations.

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Tables

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Table O-1. Life History Strategies of Dominant Willow Species Found in the Study Area.

Attribute		Willow Species								
		Sierran willow (*Salix eastwoodiae*)	**Narrow-leaf willow (*Salix exigua*)**	**Geyer's willow (*Salix geyeriana*)**	**Goodding's black willow (*Salix gooddingii*)**	**Pacific willow (*Salix lasiandra*)**	**Arroyo willow (*Salix lasiolepis*)**	**Lemmon's willow (*Salix lemmonii*)**	**Yellow willow (*Salix lutea*)**	**Gray-leaf Sierran willow (*Salix orestera*)**
Seed Initiation[1]										
Reproduction	Flowering Timing	May to July (Argus 2012a)	March to June (Argus 2012b)	April to June (Argus 2012c)	March to April (Argus 2012d)	March to June (Argus 2012e)	January to June (Argus 2012f)	May to June (Argus 2012g)	March to May (Argus 2012h)	June to July (Argus 2012i)
	Seed Dispersal Timing	Spring to mid-summer (Karrenberg et al. 2002)	May to early June (Young and Clements 2003)	Spring to mid-summer (Karrenberg et al. 2002)	June to July (Young and Clements 2003)	Spring to mid-summer (Karrenberg et al. 2002)	Late-April to mid-May (Sacchi and Price 1992)	Spring to mid-summer (Karrenberg et al. 2002)	May to early June (Young and Clements 2003)	Spring to mid-summer (Karrenberg et al. 2002)
	Seed Dispersal Agent[2]	Anemochorich and hydrochoric	Anemochorich and hydrochoric	Anemochorich and hydrochoric	Anemochoric and hydrochoric	Anemochoric and hydrochoric	Anemochoric and hydrochoric	Anemochoric and hydrochoric	Anemochoric and hydrochoric	Anemochoric and hydrochoric
	Asexual Traits	Buds on branches and underground structures (CNPS)	Sprouts from underground shoot buds on lateral roots (CNPS)	Underground structures (CNPS)	Buds on large branches and trunks, and underground structures (CNPS)	Buds on branches and underground structures (CNPS)	Buds on branches and underground structures (CNPS)	Buds on branches and underground structures (CNPS)	Underground structures and root crown (CNPS)	Sprouts from root crown or stem base (CNPS)
Germination and Establishment[3]	Seed Viability (in natural conditions)	Seeds remain viable for one week (CNPS)	Seeds remain viable for an average of 44 days (Stella et al. 2006)	Seeds remain viable for one week (CNPS)	Seeds remain viable for an average of 31 days (Stella et al. 2006)	Seeds are not dormant and remain viable for a few days (CNPS)	Seeds are not dormant and remain viable for a few days (CNPS)	Seeds are not dormant and remain viable for a few days (CNPS)	Seeds are not dormant and remain viable for a few days (CNPS)	Seeds are not dormant and remain viable for a few days (CNPS)
	Germination	Within 24 hours (Karrenberg et al. 2002)	12 to 24 hours under proper conditions (Francis 2004)	Within 24 hours (Karrenberg et al. 2002)	Within 24 hours (Karrenberg et al. 2002)	Within 24 hours (Karrenberg et al. 2002)	Within 24 hours (Karrenberg et al. 2002)	Within 24 hours (Karrenberg et al. 2002)	Within 24 hours (Karrenberg et al. 2002)	Within 24 hours (Karrenberg et al. 2002)
	Seedling Root Growth Rate (and Recession Rate Associated with Establishment)	Recession rate of 1 to 2.5 cm per day (Amlin and Rood 2002)	Recession rate of 1 to 2.5 cm per day (Amlin and Rood 2002)	Recession rate of 1 to 2.5 cm per day (Amlin and Rood 2002)	Recession rate of 1 to 2.5 cm per day (Amlin and Rood 2002)	Recession rate of 1 to 2.5 cm per day (Amlin and Rood 2002)	Recession rate of 1 to 2.5 cm per day (Amlin and Rood 2002)	Recession rate of 1 to 2.5 cm per day (Amlin and Rood 2002)	Recession rate of 1 to 2.5 cm per day (Amlin and Rood 2002)	Recession rate of 1 to 2.5 cm per day (Amlin and Rood 2002)
Dormant Season	Rooting Depth of Sapling, first growing season	40 to 60 cm (Karrenberg et al. 2002)	40 to 60 cm (Karrenberg et al. 2002)	40 to 60 cm (Karrenberg et al. 2002)	40 to 60 cm (Karrenberg et al. 2002)	40 to 60 cm (Karrenberg et al. 2002)	40 to 60 cm (Karrenberg et al. 2002)	40 to 60 cm (Karrenberg et al. 2002)	40 to 60 cm (Karrenberg et al. 2002)	40 to 60 cm (Karrenberg et al. 2002)
Maturation[4]										
	Age at Reproductive Maturity	2 years (CNPS)	2 years (CNPS)	2 years (CNPS)	2 years (CNPS)	2 years (CNPS)	2 years (CNPS)	2 years (CNPS)	2 years (CNPS)	2 years (CNPS)
	Rooting Depth of Mature Stands/Depth to Groundwater	Minimum 20 inches (USDA-NRCS)	Minimum 20 inches (USDA-NRCS)	Minimum 6 inches (USDA-NRCS)	Minimum 28 inches (USDA-NRCS)	Minimum 36 inches (USDA-NRCS)	Minimum 26 inches (USDA-NRCS)	Minimum 20 inches (USDA-NRCS)	Minimum 10 inches (USDA-NRCS)	Minimum 12 inches (USDA-NRCS)

Attribute		Willow Species								
		Sierran willow (*Salix eastwoodiae*)	**Narrow-leaf willow (*Salix exigua*)**	**Geyer's willow (*Salix geyeriana*)**	**Goodding's black willow (*Salix gooddingii*)**	**Pacific willow (*Salix lasiandra*)**	**Arroyo willow (*Salix lasiolepis*)**	**Lemmon's willow (*Salix lemmonii*)**	**Yellow willow (*Salix lutea*)**	**Gray-leaf Sierran willow (*Salix orestera*)**
	Lifespan	Stems survive 10 to 20 years (USDA-NRCS)	Stems survive 10 to 20 years (USDA-NRCS)	Stems survive 10 to 20 years (USDA-NRCS)	Stems survive 10 to 20 years (USDA-NRCS)	Stems survive 10 to 20 years (USDA-NRCS)	Stems survive 10 to 20 years (USDA-NRCS)	Stems survive 10 to 20 years (USDA-NRCS)	Stems survive 10 to 20 years (USDA-NRCS)	Stems survive 10 to 20 years (USDA-NRCS)
	Tree Height (mature tree)	Up to 4 m (CNPS)	2 to 4 m (CNPS)	Up to 6 m (CNPS)	Up to 30 m (CNPS)	Up to 53 feet (USDA-NRCS)	Up to 35 feet (USDA-NRCS)	Up to 5 m (CNPS)	Up to 16 feet (USDA-NRCS)	Up to 10 feet (USDA-NRCS)
	Diameter at Breast Height (mature tree)	10 to 15 cm (Hartwell et al. 2010)	Up to 13 cm (Francis 2004)	10 to 15 cm (Hartwell et al. 2010)	10 to 15 cm (Hartwell et al. 2010)	10 to 15 cm (Hartwell et al. 2010)	10 to 15 cm (Hartwell et al. 2010)	10 to 15 cm (Hartwell et al. 2010)	10 to 15 cm (Hartwell et al. 2010)	10 to 15 cm (Hartwell et al. 2010)
Germination/Recruitment Microsite Characteristics										
	Depth to Water Table or Elevation above Baseflow	Elevation above baseflow 0.6 to 3 m (Mahoney and Rood 2002)	Elevation above baseflow 0.6 to 3 m (Mahoney and Rood 2002)	Elevation above baseflow 0.6 to 3 m (Mahoney and Rood 2002)	Elevation above baseflow 0.6 to 3 m (Mahoney and Rood 2002)	Elevation above baseflow 0.6 to 3 m (Mahoney and Rood 2002)	Elevation above baseflow 0.6 to 3 m (Mahoney and Rood 2002)	Elevation above baseflow 0.6 to 3 m (Mahoney and Rood 2002)	Elevation above baseflow 0.6 to 3 m (Mahoney and Rood 2002)	Elevation above baseflow 0.6 to 3 m (Mahoney and Rood 2002)
	Substrate	Fine textured alluvium over subsurface of soils from silt to silty clay loam soil (USDA-NRCS)	Fresh alluvium deposits with silt, sand, or gravelly soils (CNPS)	Fine textured alluvium over subsurface of soils from silt to silty clay loam soil (USDA-NRCS)	Fine textured alluvium over subsurface of soils from silt to silty clay loam soil (USDA-NRCS)	Fine textured alluvium over subsurface of soils from silt to silty clay loam soil (USDA-NRCS)	Fine textured alluvium over subsurface of soils from silt to silty clay loam soil (USDA-NRCS)	Fine textured alluvium over subsurface of soils from silt to silty clay loam soil as well as well drained gravelly or sandy soils (USDA-NRCS)	Fine textured alluvium over subsurface of soils from silt to silty clay loam soil (USDA-NRCS)	Fine textured alluvium over subsurface of soils from silt to silty clay loam soil (USDA-NRCS)
	Location on Floodplain	Stream benches, alluvial stream terraces, broad meadows, springs, and seeps in meadows (CNPS)	Lowland alluvial floodplains, shores, and bars (Stella et al. 2006)	Stream benches, alluvial stream terraces, broad meadows, springs, and seeps in meadows (CNPS)	Lowland alluvial floodplains, shores, and bars (Stella et al. 2006)	Stream benches, alluvial stream terraces, broad meadows, springs, and seeps in meadows (CNPS)	Exposed stream banks and newly formed fluvial deposits of streambed (Sacchi and Price 1992)	Stream benches, alluvial stream terraces, broad meadows, springs, and seeps in meadows (CNPS)	Stream benches, alluvial stream terraces, broad meadows, springs, and seeps in meadows (CNPS)	Stream sides, seeps, and slopes with surface flow throughout growing season (CNPS)

[1] Initiation refers to seed dispersal, germination, and initial seedling growth.

[2] Hydrochoric: water-dispersed; Anemochoric: wind-dispersed; Zoochoric: animal-dispersed.

[3] Establishment refers to the continued survival and growth of seedlings and saplings over several years until the tree or shrub reaches maturity.

[4] Maturity (sexual) occurs once a tree begins to flower and produce seed.

Table O-2. Life History Strategies of Other Woody Riparian Species Found in the Study Area.

Attribute		Woody Riparian Species						
		Redosier dogwood (*Cornus sericea*)	**Four-line honeysuckle (*Lonicera involucrata*)**	**Lodgepole pine (*Pinus contorta ssp. murreyana*)**	**Quaking aspen (*Populus tremuloides*)**	**Western labrador-tea (*Rhododendron columbianum*)**	**Woods' rose (*Rosa woodsii ssp. ultramontana*)**	**Alpine blueberry (*Vaccinium uliginosa var. occidentale*)**
Seed Initiation[1]								
Reproduction	Flowering Timing	June to August (Calflora 2024)	June to August (Calflora 2024)	Mid-May to mid-July (County 1990)	April to May (Calflora 2024)	May to August (Calflora 2024)	May to June (Calflora 2024)	June to July (Wallace 2017)
	Seed Dispersal Timing	Late summer through fall (Petrulaitis et al. 2022)	July to August (Smreciu et al. 2013)	August to October (County 1990)	Mid-May to mid-June (Landhäusser et al. 2019)	August to October (USDA-NRCS)	July to October (USDA-NRCS)	August to October (CNPS)
	Seed Dispersal Agent[2]	Zoochorich	Zoochoric	Zoochoric and anemochoric	Anemochoric	Anemochoric	Zoochorich and hydrochoric	Zoochorich and hydrochoric
	Asexual Traits	Buds on large branches or trunks, underground structures (roots, stolons, and stem bases) (CNPS)	Buds on branches and underground structures (CNPS)	None (CNPS)	Root sprouts and extensive clones of root-interconnected trees (USDA-NRCS)	Buds sprout from stems, root crowns, and rhizomes (CNPS)	Spreads through underground rhizomes. Sprouting from root crown, and by layering (Francis 2004)	Shallow rhizomes (CNPS)
Germination and Establishment[3]	Seed Viability (in natural conditions)	27% to 63% viability in the upper soil layer (Petrulaitis et al. 2022)	15% viability of sown seedlings (Smreciu et al. 2013)	75% seed viability for up to 15 years (CNPS)	Seeds are 95% viable for 2 to 4 weeks (USDA-NRCS)	Average of 89% viability (Erfmeier and Bruelheide 2004)	Seeds 44% to 64% viable for 2 to 5 years (Francis 2004)	48% viability after stratification (Jacquemart 1996)
	Germination	Cold stratification is necessary (CNPS)	40 to 60 days (Smreciu et al. 2013)	75% to 95% of total germination occurs 2 weeks following snowmelt (Lotan and Critchfield)	No dormancy and can germinate within 24 hours to 2 weeks (Landhäusser et al. 2019)	Require light from short-lived seedbanks (CNPS)	Germinate within 30 to 40 days after stratification (USDA-NRCS)	Germination occurs within 5 to 24 days (Jacquemart 1996)
	Seedling Root Growth Rate (and Recession Rate Associated with Establishment)	3 mm per day (Day et al. 2000)	3 mm per day (Day et al. 2000)	Lateral roots up to 23 inches with taproot extending up to 30 inches (Gail et al. 1935)	20 to 40 mm within two weeks of germination (Landhäusser et al. 2019)	1.5 to 2 mm within two weeks of germination (Faravani and Bakar 2007)	3 mm per day (Day et al. 2000)	4 mm within 21 days of germination (Jacquemart 1996)
Dormant Season	Rooting Depth of Sapling, first growing season	Taproot extends 2 cm (Dominique et al. 2010)	Up to 7 cm (Deering and Vankat 1999)	12 to 15 cm (County 1990)	Lateral roots extend 20 to 40 cm and limited to upper 20 cm of soil (Landhäusser et al. 2019)	15 to 20 cm (Hébert and Thiffault 2011)	Up to 7 cm (Deering and Vankat 1999)	Minimum of 40 cm (USDA-NRCS)

Attribute		Woody Riparian Species						
		Redosier dogwood (*Cornus sericea*)	**Four-line honeysuckle (*Lonicera involucrata*)**	**Lodgepole pine (*Pinus contorta ssp. murreyana*)**	**Quaking aspen (*Populus tremuloides*)**	**Western labrador-tea (*Rhododendron columbianum*)**	**Woods' rose (*Rosa woodsii ssp. ultramontana*)**	**Alpine blueberry (*Vaccinium uliginosa var. occidentale*)**
Maturation[4]								
	Age at Reproductive Maturity	Reach sexual maturity at 3 to 4 years (Petrulaitis et al. 2022)	5 to 8 years (Deering and Vankat 1999)	5 to 10 years (Lotan and Critchfield)	10 to 20 years (Ally et al. 2010)	2 years (CNPS)	2 to 5 years (USDA-NRCS)	2 to 3 years (Tolvanen)
	Rooting Depth of Mature Stands/Depth to Groundwater	Minimum 20 inches (USDA-NRCS)	Minimum 12 inches (USDA-NRCS)	Minimum 20 inches (USDA-NRCS)	Up to 3 m (USDA-NRCS)	50 cm (USDA-NRCS)	Minimum 12 inches (USDA-NRCS)	Minimum 12 inches (USDA-NRCS)
	Lifespan	Stems survive 10 to 20 years (USDA-NRCS)	Stems survive 10 to 20 years (USDA-NRCS)	Over 600 years (USDA-NRCS)	Unknown with oldest clone potentially 10,000 years (Ally et al. 2010)	Up to 85 years (Erfmeier and Bruelheide 2004)	Stems survive 10 to 20 years (USDA-NRCS)	Stems survive up to 60 years (Jacquemart 1996)
	Tree Height (mature tree)	1.4 to 6 m (USDA-NRCS)	Up to 12(16) feet (USDA-NRCS)	30 to 99 feet (USDA-NRCS)	40 to 65 feet (USDA-NRCS)	1.5 m (CNPS)	0.2 to 2(3) m (USDA-NRCS)	Up to 1 m (CNPS)
	Diameter at Breast Height (mature tree)	Up to 13 cm (Francis 2004)	Up to 13 cm (Francis 2004)	Average of 42 cm (County 1990)	Average of 28 cm (Rytter and Stener 2005)	Average of 2 cm (Cary and Pittermann 2018)	Up to 10 cm (Francis 2004)	Up to 1 cm with average annual increase of 0.04 mm (Jacquemart 1996)
Germination/Recruitment Microsite Characteristics								
	Depth to Water Table or Elevation above Baseflow	Tolerant of fluctuating water tables (Francis 2004)	Elevation above baseflow 0.6 to 3 m (Mahoney and Rood 2002)	Tolerant of fluctuating water tables (Francis 2004)	0.5 to 3.0 m (Shafroth et al. 2000)	Elevation above baseflow 0.6 to 3 m (Mahoney and Rood 2002)	Tolerant of fluctuating water tables (Francis 2004)	Depth to water table 30 to 70 cm (Bragazza and Gerdol 1996)
	Substrate	Nitrogen-rich, saturated, and shallowly inundated soils (USDA-NRCS)	Soils vary from course sand to fine textured silt and clay (USDA-NRCS)	Soils vary from gravelly loamy course sand to fine sandy loam (USDA-NRCS)	Well-drained loamy soils with high organic content (Landhäusser et al. 2019)	Soils are loamy with a high organic content (CNPS)	Well-drained clay loam, sandy loam, or sandy soils (Francis 2004)	Acidic soils poor in nutrients and poorly drained (Jacquemart 1996)
	Location on Floodplain	Common on edges of lakes, ponds, within wetlands, and along streams (USDA-NRCS)	Found on moist, seasonally wet, and flooded sites, habitats include moist woods, thickets, riparian zones and bogs (USDA-NRCS)	Montane stands are associated with moist meadow and lake margins; subalpine stands occupy upland settings on glaciated surfaces and till with skeletal soils (CNPS)	Depressions, swales, slopes, meadow margins, stream corridors, elevated stream terraces, and colluvial toe slopes (CNPS)	Moderate to gentle concave slopes and meadows at the bottom of broad valleys adjacent to streams, seeps, lakes, ponds, and saturated swales. Sites receive water from subsurface flows (CNPS)	Found on plains, along marshes, lake shores, and riparian communities with well-drained, wet to dry, loamy to sandy soils on any aspect (Shaw et al. 2004)	Alpine fens, meadows, and streamsides with relatively flat terrain (CNPS)

[1] Initiation refers to seed dispersal, germination, and initial seedling growth.

[2] Hydrochoric: water-dispersed; Anemochoric: wind-dispersed; Zoochoric: animal-dispersed.

[3] Establishment refers to the continued survival and growth of seedlings and saplings over several years until the tree or shrub reaches maturity.

[4] Maturity (sexual) occurs once a tree begins to flower and produce seed.

Table O-3. Timing of Flowering and Seed Dispersal for Common Woody Riparian Species in the Study Area

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flowering and Seed Dispersal												
DOGWOODS												
American Dogwood (*Cornus sericea*)												
Flowering (Calflora 2023)												
Seed Dispersal (Petrulaitis et al. 2022)												
HONEYSUCKLES												
Twin Berry (*Lonicera involucrata*)												
Flowering (Calflora 2023)												
Seed Dispersal (Smreciu et al. 2013)												
PINES												
Lodgepole Pine (*Pinus contorta* ssp. *murrayana*)												

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flowering and Seed Dispersal												
Flowering (Calflora 2023)												
Seed Dispersal (County 1990)												
ASPENS												
Quaking Aspen (*Populus tremuloides*)												
Flowering (Calflora 2023)												
Seed Dispersal (Landhäusser et al. 2019)												
HEATHS												
Western Labrador Tea (*Rhododendron columbianum*)												
Flowering (Calflora 2023)												
Seed Dispersal (USDA-NRCS 2023)												

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flowering and Seed Dispersal												
Western Blueberry (*Vaccinium uliginosum* ssp. *occidentale*)												
Flowering (Calflora 2023)												
Seed Dispersal (CNPS 2023)												
ROSES												
Interior Rose (*Rosa woodsii* ssp. *ultramontana*)												
Flowering (Calflora 2023)												
Seed Dispersal (USDA-NRCS 2023)												
WILLOWS												
Mountain Willow (*Salix eastwoodiae*)												
Flowering (Argus 2012a)												

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flowering and Seed Dispersal												
Seed Dispersal (Karrenberg et al. 2002)												
Narrowleaf Willow (*Salix exigua*)												
Flowering (Argus 2012b)												
Seed Dispersal (Young and Clements 2003)												
Geyer's Willow (*Salix geyeriana*)												
Flowering (Argus 2012c)												
Seed Dispersal (Karrenberg et al. 2002)												
Goodding's Willow												
Flowering (Argus 2012d)												
Seed Dispersal (Young and Clements 2003)												

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flowering and Seed Dispersal												
Pacific Willow (*Salix lasiandra*)												
Flowering (Argus 2012e)												
Seed Dispersal (Karrenberg et al. 2002)												
Arroyo Willow (*Salix lasiolepis*)												
Flowering (Argus 2012f)												
Seed Dispersal (Sacchi and Price 1992)												
Lemmon's Willow (*Salix lemmonii*)												
Flowering (Argus 2012g)												
Seed Dispersal (Karrenberg et al. 2002)												
Yellow Willow (*Salix lutea*)												
Flowering (Argus 2012h)												

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Flowering and Seed Dispersal												
Seed Dispersal (Young and Clements 2003)												
Sierra Willow (*Salix orestera*)												
Flowering (Argus 2012i)												
Seed Dispersal (Karrenberg et al. 2002)												