INITIAL CONSULTATION DOCUMENT

In Support of an Application for a Capacity Related License Amendment

Bear River Hydroelectric Project
FERC Project No. 20

Oneida Pumped Storage Facility

Volume 1 of 3: Public

Submitted by:

PACIFICORP

REVISED
October 2023

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LIST OF ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
°F	degrees Fahrenheit
ADA	Americans with Disability Act
APE	Area of Potential Effect
BLM	U.S. Bureau of Land Management
BOR	U.S. Bureau of Reclamation
CEII	Critical Energy Infrastructure Information
cfs	cubic feet per second
CFR	Code of Federal Regulations
Commission	Federal Energy Regulatory Commission
DHAC	(FERC) Division of Hydropower Administration and Compliance
DO	dissolved oxygen
ECC	Environmental Coordination Committee
EPA	U.S. Environmental Protection Agency
EPT	mayflies (*Ephemeroptera*), stoneflies (*Plecoptera*), and caddisflies (*Trichoptera*)
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
FPA	Federal Power Act
FWS	U.S. Fish and Wildlife Service
GMU	Geographic Management Units
H.W.	high water
ICD	Initial Consultation Document
IDEQ	Idaho Department of Environmental Quality
IDFG	Idaho Department of Fish and Game
IPaC	(FWS) Information for Planning and Consultation
ISHPO	Idaho State Historic Preservation Office
km	kilometer
KOP	key observation point
kV	kilovolts
kVA	kilovolt-amperes
kW	kilowatts

L.W.	low water
mg/L	milligrams per liter
mm	millimeter
msl	mean sea level
MW	megawatts
MWh	megawatt hours
NA	Not Applicable
NAGPRA	Native American Graves Protection and Repatriation Act of 1990
National Register	National Register of Historic Places
NOC	Notice of Commencement
NOI	Notice of Intent
NRCS	Natural Resource Conservation Service
NWI	National Wetlands Inventory
OHV	off-highway vehicle
SHPO	State Historic Preservation Office
TLP	Traditional Licensing Process
TMDL	total maximum daily load
TP	total phosphorus
TSS	total suspended solids
USC	United States Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
USU	Utah State University

1.0 INTRODUCTION

PacifiCorp is the owner, operator, and licensee of the Bear River Hydroelectric Project (Bear River Project), Federal Energy Regulatory Commission (Commission or FERC) Project No. 20. The Bear River Project is located in southeastern Idaho, in the Franklin and Caribou counties, about 14 miles northeast of Preston, Idaho. The Bear River Project was issued a 30-year license by the Commission on December 22, 2003, with an effective date of December 1, 2003 (105 FERC ¶ 62,207). The current license expires on November 30, 2033. The Bear River Project is composed of three hydroelectric developments: Soda, Grace, and Oneida.

PacifiCorp is filing this Initial Consultation Document (ICD) with the Commission to initiate the amendment process of the current license of the Bear River Project to include a pumped storage facility integrated into the Oneida Development. The Oneida Pumped Storage Facility (Project) is intended to store renewable energy generated from an increasing amount of renewable energy resources interconnected to PacifiCorp's system and enhance the flexibility and reliability of the electric system. Capacity amendments are required when the proposed facility would increase the generating capacity by more than 2 MW and the hydraulic capacity by more than 15 percent.[1] The Project will exceed these limits. Therefore, PacifiCorp intends to file a capacity related amendment application with the Commission that would amend the Bear River Project's current license. With this proposed amendment, PacifiCorp also proposes to request an extension of the current license term for an additional 20 years.

PacifiCorp's new pumped storage facility would be an open-loop facility that consists of: (1) an upper reservoir with a surface area of 22.75 acres and a total storage capacity of 2,660 acre-feet at a normal maximum operating elevation of 6,030 feet average mean sea level (msl); (2) the lower reservoir would be the existing Oneida Development reservoir, with a surface area of 480 acres and a total storage capacity of 10,880 acre-feet at a normal maximum operating elevation of 4,882.90 feet USGS datum; (3) a 1,175-foot-long intake/tailrace pipeline and 5,800-foot-long penstock, with a hydraulic head of 1,123 feet, connecting the upper and lower reservoirs to the powerhouse; (4) a new powerhouse sited just north of the existing Oneida powerhouse that would contain 2 pump turbine-generator units with a total rated capacity of 200 MW; (5) a 0.5-mile-long, 138-kilovolt (kV) transmission line connecting the new powerhouse substation to PacifiCorp's existing Oneida substation; and (8) appurtenant facilities.

According to 18 CFR 4.38(a)(6)(iv), the process to amend the current Bear River Project license to include the proposed pumped storage facility is subject to the same pre-filing three stage consultation process of the Commission's Traditional Licensing Process described in 18 CFR § 4.38(b), (c), and (d). Therefore, this ICD contains the same content as a pre-application document required by 18 CFR § 5.6.

1.1 LICENSEE CONTACTS

The exact name, business address, and telephone number of each person authorized to act as an agent for the Licensee are:

[1] The existing total hydraulic capacity of the Bear River Project is 7,151 cfs.

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2.0 LICENSE AMENDMENT PROCESS PLAN AND SCHEDULE

PacifiCorp has developed this process plan and schedule to amend the current license for the Bear River Project. For this license amendment proceeding, PacifiCorp intends to provide adequate opportunities to involve all parties and individuals who have or may have an interest in the proceeding. PacifiCorp will document the process, including any information received from the interested parties and communication records. PacifiCorp will maintain records of the proceeding and other information that is publicly available. The process plan and schedule are based on actions by the Commission, PacifiCorp, and interest parties. PacifiCorp plans early and frequent coordination with FERC, resource agencies, and other parties to identify potential issues and study needs. PacifiCorp will adopt an efficient and timely schedule for consultation with the stakeholders and for document production. Provided below is PacifiCorp's plan for communication, document distribution, handling of sensitive information, scheduling, and meetings during the amendment process.

2.1 COMMUNICATIONS AND STAKEHOLDER LIST

PacifiCorp is proposing a communication protocol to establish guidelines for effective participation and communication in the license amendment process. The primary means of communication will be meetings, formal documents, email, and telephone. To establish the consultation record, all formal correspondence will require adequate documentation. Communication will occur among PacifiCorp, PacifiCorp's agents, FERC, regulators and interested parties.

Throughout the license amendment process, PacifiCorp will maintain a list of those who have an interest in the Project. The stakeholder list will include those interested parties, such as individuals, Indian Tribes, governmental agencies (local, state, federal), and non-government organizations. The list will include mailing addresses and available email addresses for distributing notices, documents for public review, and solicitation of comments. Appendix A identifies the stakeholder list for this ICD distribution.

2.2 DOCUMENT DISTRIBUTION

PacifiCorp or its agent will distribute, whenever possible, all documents electronically, but may distribute hard copies of some documents for convenience or by request. PacifiCorp will distribute documents via email with a link to the Project's website or via attachments to emails. The website for the Bear River Project license amendment is: https://www.pacificorp.com/energy/storage/oneida.html. Documents filed with the Commission will also be available from FERC's eLibrary at https://elibrary.ferc.gov/eLibrary/search by searching under Docket "P-20." Requests for hard copies of documents should be sent to the contact provided in Section 1.0 above, and should clearly indicate the document name, publication date (if known), and FERC Project No. 20.

If possible, PacifiCorp prefers to receive all documents electronically, in an appropriate format. Email electronic documents to PacifiCorp at the above contact identified in Section 1. Hard copy documents may be mailed to the above address as well. All documents received, either electronically or by mail, will become part of the consultation record and be available for

distribution to the public. In addition, to being available on the website for the Bear River Project license amendment and FERC's eLibrary, this ICD is available for public inspection and reproduction during normal business hours at:

Larsen-Sant Public Library
109 South 1st
Preston ID, 83263

2.3 SENSITIVE INFORMATION

Certain Project-related documents and information are considered to be Critical Energy Infrastructure Information (CEII) or Privileged. These documents are restricted from public viewing in accordance with section 388 of the Commission's regulations, 18 CFR § 388.113 and 18 CFR § 388.112. This information relates to the design and safety of the dams and appurtenant facilities, as well as information considered commercially sensitive. Anyone seeking information protected as CEII from the Commission must file a CEII request. FERC's website at: https://www.ferc.gov/resources/guides/filing-guide/ceii-request.asp contains additional details related to CEII. PacifiCorp will allow limited access to documents containing sensitive information regarding specific cultural and/or protected environmental resources to authorized entities.

2.4 MEETINGS

PacifiCorp recognizes a number of agencies, Indian Tribes, groups, and individuals may want to participate in the license amendment process. PacifiCorp will work with all interested parties to develop meeting schedules that include locations and times that accommodate the majority of participants. PacifiCorp will follow the notification procedures for meetings as required by FERC regulations. PacifiCorp may schedule additional meetings to enhance the consultation process, as necessary. Meeting summaries will be prepared and become part of the consultation record. A meeting transcript will be prepared for the Joint Agency Meeting and likewise will become part of the consultation record.

2.5 SCHEDULE

Table 2-1 provides the amendment process plan and schedule. PacifiCorp respectfully requests interested parties to note the amendment process generally follows FERC's Traditional Licensing Process (TLP). The amendment process plan and schedule provide time frames for consultation and information gathering and studies. At times, the process plan and schedule may reflect deadlines that fall on weekend days (Saturday or Sunday) or federal holidays. As such, weekend or holiday deadlines will default to the following Monday or business day in accordance with FERC regulations (Rule 2007; § 385.2007).

PacifiCorp is required to host, between 30 to 60 days following the filing with the Commission and distribution of the ICD, a Joint Agency Meeting among stakeholders, including agencies, Tribes, and the public. PacifiCorp has tentatively scheduled this meeting and site visit for October 25, 2023; details of locations and times will be provided at least 15 days in advance. PacifiCorp anticipates the venue location to be in Preston, ID and on site at the Oneida Development. Additionally, depending on consultation with resource agencies, PacifiCorp intends to provide to all interested parties a draft license amendment application sometime during the third quarter of 2024.

PacifiCorp will then work toward the goal of filing a final license amendment application with the Commission on or before January 2, 2025.

Table 2-1. Bear River Project license amendment process plan and schedule.

Activity	Responsible Party	Time Frame	Target Deadline[a,b]
Distribute Draft Study Plan Document	PacifiCorp	Complete	April 2023
Implement studies and information gathering described in Draft Study Plan Document	PacifiCorp	Underway	Spring, Summer and Fall of 2023 and 2024.
Stage 1			
File and distribute the ICD	PacifiCorp	Not Applicable	September 18, 2023
Notification provided to the Commission and stakeholders of Joint Agency Meeting	PacifiCorp	At least 15 days prior to the meeting	At a minimum 15 days prior to October 25, 2023.
Publish a public notice of the Joint Agency Meeting in a daily or weekly newspaper	PacifiCorp	At least 14 days prior to the meeting	At a minimum 14 days prior to October 25, 2023
Joint Agency Meeting with stakeholders	PacifiCorp, Stakeholders	30 to 60 days after filing of the ICD	October 25, 2023
Comments on the ICD and study requests	Stakeholders	No later than 60 days after the Joint Agency Meeting and site visit	Due by December 27, 2023
Consultation on ICD comments, study requests, and Study Plan Development	PacifiCorp, Stakeholders	Following receipt of comments and study requests from stakeholders	December 2023 through Winter 2024.
Stage 2			
Perform field studies	PacifiCorp	–	Spring, summer, and fall of 2023 and 2024
Circulate draft study reports and solicit comments	PacifiCorp, Stakeholders	After completion of field studies	As study reports become available in 2023 and 2024.
Prepare and distribute draft license amendment application with study reports	PacifiCorp	Produced concurrently with previous activities and following conclusion of field studies	Fall/Winter 2024

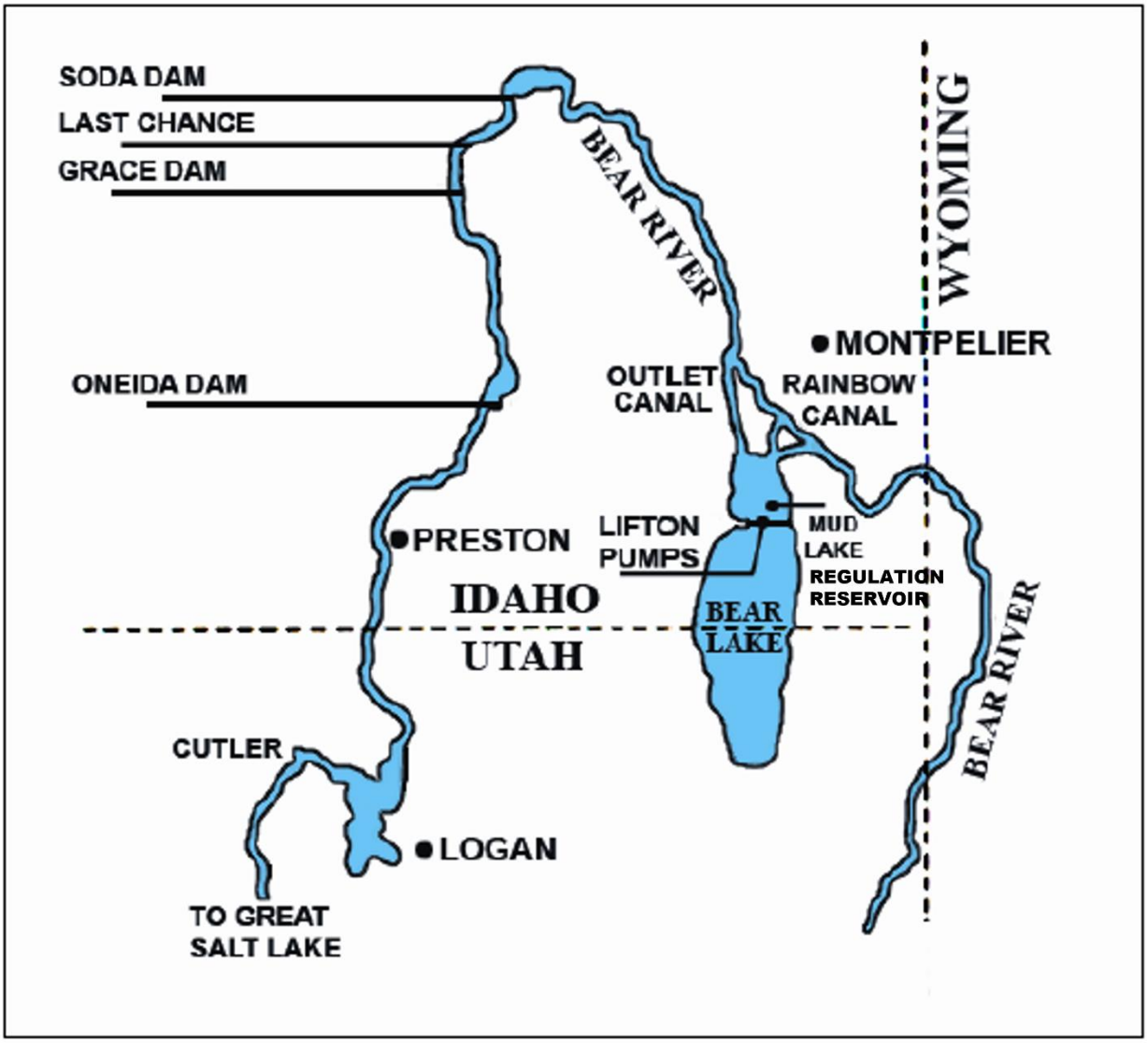
Activity	Responsible Party	Time Frame	Target Deadline[a,b]
Review and provide comments on the draft license amendment application	Resource Agencies, Tribes and other stakeholders	No later than 90 days after receipt of the draft license application	Winter 2024
Stage 3[c]			
Prepare and file final license amendment application	PacifiCorp	–	Winter 2025/Spring 2025
FERC issues Additional Information Requests	FERC	Within 14 days of the final license amendment application filing date	–[c]
FERC issues Notice Accepting Application and Soliciting Comments, Motions to Intervene, and Protest	FERC	–	–[c]
FERC Issues EA/EIS	FERC	–	–[c]
FERC Issues Amendment Order	FERC	–	–[c]

[a] The dates shown are dependent on the date the ICD is filed with the Commission and distributed to stakeholder.
[b] If the end of any time period falls on weekend day, or other day the Commission is closed, the filing is due the next business day (Rule 2007; § 385.2007).
[c.] FERC does not have a specific timeline requirement for Amendment Application reviews.

3.0 PROJECT LOCATION, FACILITIES, AND OPERATION

3.1 PROJECT LOCATION

The Bear River Project (FERC No. 20) is situated on the Bear River in Caribou and Franklin counties, Idaho (Figure 3.1-1). The Bear River system originates in the Uinta Mountains in Utah, first flowing north through Wyoming and southeast Idaho, where it makes a U-turn south eventually re-entering Utah and discharging into the Great Salt Lake. The river system is primarily regulated for irrigation and flood control. There are a total of five hydroelectric dams that span the Bear River, the middle three of which comprise the three developments that make up the Bear River Project. From upstream to downstream are the Soda, Grace, and Oneida developments (Figure 3.1-1). The Soda Development (42.6442, -111.6956) is located 5 miles west of the City of Soda Springs in Caribou County. Approximately 6 river miles downstream of the Soda Development is the Grace Development (42.5873, -111.7279), also located in Caribou County. An additional 36 river miles downstream is the Oneida Development (42.2758, -111.7489), situated in Franklin County, approximately 15 miles northwest of Preston, Idaho. Downstream approximately 44 river miles of the Oneida Development is the Cutler Hydroelectric Project (FERC No. 2420). The Cutler Hydroelectric Project is the last dam and hydroelectric facility on the Bear River, after which it flows freely for 72 river miles to the Great Salt Lake.



Source: FERC (2015)

Figure 3.1-1. Bear River Project location map.

3.2 EXISTING FACILITIES

The Bear River Project consists of three hydroelectric developments: Soda, Grace, and Oneida. A project is defined as all project works and all lands and waters necessary for operation and maintenance and special purposes, such as recreation, shoreline control, or protection of environmental resources. While the Soda and Grace developments are integral to the Bear River Project, the proposed Project would not affect their respective operation. Therefore, the existing principal facilities of the Soda and Grace developments are briefly described below, while the existing facilities for the Oneida Development are provide in more detail.

3.2.1 Soda Development

The Soda Development consists of: (1) a 103-foot-high by 433-foot-long concrete dam, with a 210-foot-long non-overflow gravity section, a 109-foot-long integral powerhouse section

containing five headgates that supply water to the generating unit penstocks and to a 900-cubic feet per second (cfs)-capacity low-level discharge (Johnson valve), and a 114-foot-long gated overflow spillway section containing three, 30-foot by 14-foot Taintor gates; (2) a 55-foot-long by 19-foot-high earth fill dam; (3) the Soda reservoir (also called Alexander reservoir) with a surface area of 1,100 acres, an active storage capacity of 16,300 acre-feet, and a normal maximum full pool elevation of 5,720 feet U.S. Geological Survey (USGS) datum; (4) the 41-foot by 109-foot powerhouse contains two vertical Francis units, each with an installed capacity of 7 MW and maximum hydraulic capacities of 1,287 and 1,337 cfs, respectively; (5) a tailrace immediately downstream of the powerhouse with a normal tailwater elevation of 5,641 feet USGS datum; and (6) a substation containing step-up transformers and circuit breakers, located immediately adjacent to the powerhouse, which also serves as the development's point of interconnection to the transmission grid system.

3.2.2 Grace Development

The Grace Development consists of: (1) a 51-foot-high by 180-foot-long rock-filled timber crib dam, with a concrete core and a 120-foot-long central spillway section with 8-foot-high wooden flashboards; (2) a 250-foot-long earthen dam on the right abutment; (3) a forebay with 250 acre-feet of usable storage capacity at a surface elevation of 5,555 feet (USGS datum); (4) a 52-foot-wide intake structure contained within a concrete stucco building, adjacent to the earth embankment section of the dam, containing eighteen 5-foot by 10-foot screen sections; (5) a 26,000-foot-long, 11-foot-diameter flowline, consisting of 15,000 feet of steel and 11,000 feet of wood stave pipeline; (6) two surge tanks, one 10 feet in diameter and 38 feet high, located about 2.6 miles downstream of the diversion, and the other 30 feet in diameter and 132 feet high, located directly above the powerhouse; (7) three 90-inch-diameter steel penstocks, equipped with two butterfly valves; (8) a 53-foot by 148.5-foot powerhouse containing three vertical Francis units, each with an installed capacity of 11 MW and a hydraulic capacity of 320 cfs; (9) a tailrace consisting of a short concrete-lined section that transitions to an unlined open channel section; and (10) a substation containing step-up transformers and circuit breakers, located immediately adjacent to the powerhouse, which also serves as the development's point of interconnection to the transmission grid system.

3.2.3 Oneida Development

Principal works of the Oneida Development consist of: (1) Oneida dam, a 111-foot-high by 387-foot-long concrete gravity structure that includes a 118-foot-long uncontrolled auxiliary spillway, a 66-foot-long non-overflow gravity section, a 99-foot-long gated spillway containing five Taintor gates, and an 86-foot-long gravity section with ice sluices; (2) a 40-foot-high, 1,100-foot-long embankment dam; (3) Oneida Reservoir with an active storage capacity of 10,880 acre-feet and a surface area of 480 acres at a maximum full pool elevation of 4,882.90 feet (USGS datum); (4) a 50-foot-wide by 50-foot-high intake structure, containing six openings fitted with trashracks, with a transition to two, 16-foot-diameter circular outlets; (5) a 16-foot-diameter, 2,240-foot-long steel flowline (pipeline); (6) a 40-foot-diameter, 142-foot-high surge tank; (7) three, 12-foot-diameter, 120-foot-long steel penstocks extending from the surge tank; (8) a 52-foot by 162-foot powerhouse containing three vertical Francis units, each with an installed capacity of 10 MW and hydraulic capacities of 1,161, 1,161, and 968 cfs, respectively; (9) a 64-foot-wide by 118-foot-long rectangular channel tailrace; and (10) a substation containing step-up transformers, located immediately adjacent to the powerhouse, which also

serves as the point of interconnection to the transmission grid system. These facilities are discussed in detail below, and their locations are shown on Figure 3.2-1.

Dam and Spillway

Oneida Dam comprises an embankment dam and a post-tensioned concrete dam. The embankment dam is approximately 40 feet high and 1,100 feet long and closes off a low saddle area. There is a ridge area that separates the embankment dam and the concrete dam. The concrete dam structure consists of an uncontrolled spillway, a non-overflow gravity section and a Tainter-gated spillway section. The concrete dam, including the spillway section, is approximately 387 feet long with a maximum structural height of 111 feet.

The right end of the concrete dam consists of a 117-foot 10-inch long uncontrolled, auxiliary spillway with a crest elevation of 4,882.90 feet USGS. Left of the uncontrolled spillway is a 65-foot 9-inch-long non-overflow gravity section that has a crest width of 10.5 feet and contains two 96-inch diameter low level outlet passages which are not presently in service due to many years of reservoir silt deposits. The temporary sluices are controlled by two slide gates installed on the upstream face at elevation 4,805 and by two drain valves on the downstream side. A 99-foot-long Tainter-gated spillway section with five 15-foot wide by 12.5-foot-high gates is to the left of the non-overflow section. The gated spillway section has a crest elevation of 4,871. The gates are operated individually via electric chain hoists. The capacity of the gated spillway at the reservoir elevation 4,882.90 is 14,000 cfs. An 86-foot-long gravity section with ice sluices forms the left end of the concrete dam.

The combined discharge capacity of the spillways is approximately 17,200 cfs at elevation 4,854.00 compared to an estimated peak flow for the Probable Maximum Flood (PMF) of 74,700 cfs. Previous analyses demonstrated that the spillway was hydraulically inadequate to safely pass the PMF without overtopping the embankment dam. A 7-foot-high concrete parapet wall was constructed on top of the embankment dam in 1992 to prevent overtopping during the PMF. The concrete dam can now safely pass the PMF.

Reservoir

The concrete dam and the embankment dam contain a reservoir of approximately 480 acres with 10,880 acre-feet of active storage at maximum full pool elevation 4,882.90. The normal operating full pool elevation for Oneida Reservoir is 4,882.40. The reservoir at maximum full pool is at elevation 4,882.90 (Auxiliary Spillway crest). Approximately 11,500 acre-feet of intermediate storage is available at the Oneida Reservoir. Practical use of this intermediate storage, however, is limited.

Intake Structure

A square concrete intake structure is approximately 50 feet upstream of the embankment dam and is 50 feet high and 50 feet wide. On the two upstream faces are three sets of trash racks that are protected from ice buildup by an air bubbling system. The intake transitions to two 16-foot-diameter circular outlets that extend through the base of the embankment dam. One of these outlets is stubbed at the toe of the dam while the second outlet connects to the flowline that

extends the surge tank above the powerhouse. Two vertical slide gates are located at the upper end of the two 16-foot-diameter conduits.

Water Conveyance System

The water conveyance system consists of a 16-foot diameter, riveted steel flowline that extends for a distance of about 2,240 feet from the base of the embankment dam to the surge tank, located immediately upstream of the powerhouse. The flowline is supported on concrete saddles. The surge tank is 40-feet in diameter and serves as a transition from the flowline to three 12-foot-diamter penstocks. The surge tank is constructed of riveted steel with a concrete base. The riveted steel section is 117 feet high, and the concrete base section is approximately 25 feet high. The three 12-foot-diameter, 120-foot-long, steel penstocks extend from the surge tank to the powerhouse. The flowlines and penstocks are buried for their entire length from the embankment dam to the surge tank and from the surge tank to the butterfly valves located immediately upstream of the powerhouse turbines. At the end of each penstock are 12-foot diameter butterfly valves that are utilized for turbine unit isolation.

Powerhouse

The concrete and masonry powerhouse measures 52 feet by 162 feet and houses the three turbine units. The structure is coated on the exterior with a stucco facing treated with a thermoplastic coating for weather protection and sealing. The three turbines are vertical, reaction (Francis-style) turbines each rated at 15,000 hp and 180 rpm, with a design-operating head of 140 feet. The turbine runners were replaced as follows: Unit 1, 1947; Unit 2, 2004; and Unit 3, 2018. The Unit 3 turbine bearing was refurbished in 2013. Each turbine is equipped with a three-phase, 60 Hz, synchronous generator, each with an original rating of 10,000 kW, 0.9 power factor. Unit 2 records indicate that a stator rewind was completed in 1964 with no change in nameplate capacity. Units 1 and 3 each have also been refurbished with new stator windings and reinsulated field poles (1983 and 1985, respectively) and each displays a nameplate showing a rating of 10,000 kW, 0.9 power factor. Although the windings have been replaced and/or refurbished, the units remain turbine limited. The resulting plant installed capacity is 30,000 kW. General Electric static exciters rated at 250 volts direct current (DC) are located on the upper level of the powerhouse above the generator circuit breakers. The Unit 3 thrust bearings were rebabbitted in 2013. The Unit 1 and 3 bearing lube oil pumping systems (skids) were replaced in 2013.

Tailrace

The Oneida Powerhouse discharges into the Bear River via a rectangular channel tailrace approximately 64-feet wide and 118-feet long at the point of convergence with the bypass reach. Concrete sidewalls extend from the powerhouse at right angles. Riprap protects the bank near the downstream end of the south tailrace sidewall, while the north tailrace sidewall ends at the east bank of the Bear River. The tailrace is concrete lined between the powerhouse and its discharge to the Bear River.

Substation

The local Oneida Substation is the point of interconnection with PacifiCorp 138 kV transmission system. The substation contains two main generator step-up transformers that steps the voltage

from 6,600 volts to 138,000 volts. The transformers, which are configured to split the output from the common generator bus, are each rated at 20,000 kVA. Each transformer is directly connected to distinct 138 kV transmission lines, each with a dedicated 138 kV circuit breaker. The switchyard and substation for the powerhouse is located on the east bank of the Bear River immediately downstream of the powerhouse. The ground elevation of the switchyard is 4,730.0 feet USGS.

Appurtenances

Notable appurtenances at the Oneida Development include a maintenance shop, a 115-kW emergency generator and a 25-kW emergency generator. The maintenance shop/garage building is located south of the powerhouse, opposite the substation. This building serves as a garage, lunchroom, and light duty maintenance shop. The 115-kW emergency propane generator is on the west end of the embankment dam. This emergency power unit provides power to operate the dam's intake gate and spillway gates in the event that there is a loss of normal stations service. The emergency propane generator can also provide power to service the in-plant loads. The 25-kW emergency generator with an auto transfer switch and a programmable logic controller were installed at the dam in 2007. This system automatically opens a spill gate to a certain position to maintain the required instream flow in the event that all three generating units trip at the powerhouse. This system was installed as a voluntary measure and is inoperable during winter icing.

Recreation Sites

Five recreation sites are associated with the Oneida Development. These sites include: (1) Maple Grove Campground; (2) Oneida Day Use Area; (3) Redpoint Campground; (4) Oneida Narrows Put-In; and (5) Oneida Narrows Take-Out. Descriptions of these sites are provided below, and their respective locations are presented in Figure 3.2-1.

Maple Grove Campground

The Maple Grove Campground is a U.S. Bureau of Land Management (BLM) facility located on the southeastern shoreline of Oneida Reservoir, approximately 1.7 miles upstream from Oneida powerhouse. Although within the FERC Project Boundary (Project Boundary) of the Bear River Project, this facility is managed by BLM. The campground has 12 campsites, two of which are ADA accessible, each with a single picnic tables and grill, and two vaulted toilet buildings, also ADA accessible. There is also a small day-use area with a boat ramp, floating dock, and a gravel parking area suitable for four vehicles.

Oneida Day Use Area

The PacifiCorp’s Oneida Day Use Area is located on the southeastern shoreline of Oneida Reservoir, immediately upstream of embankment dam. The area has a boat ramp, floating dock, 10 picnic sites each with a picnic table, grill, and fire pit, a double vaulted toilet building, and three gravel parking areas for a total of approximately 35 vehicles. This facility is within the Project Boundary.

Redpoint Campground

The Redpoint Campground is a BLM facility allocated along the Bear River, approximately 2.4 miles downstream of the Oneida powerhouse. Like Maple Grove Campground, Redpoint Campground is within the Project Boundary and managed by BLM. The site has 10 campsites each with picnic tables and grills, a vaulted toilet building, and a day use picnic site with grill and non-motorized boater access.

Oneida Narrows Put-In

The PacifiCorp's Oneida Narrows Put-In is about 0.6 miles downstream of Oneida powerhouse and has a hand-launch boat ramp, a gravel parking area suitable for approximately 30 vehicles, including two ADA, and a portable rest room. This site is within the Project Boundary.

Oneida Narrows Take-Out

The Oneida Narrows Take-Out is approximately 4.6 miles downstream of Oneida powerhouse and has a hand-launch boat ramp, parking area along the road suitable for approximately 40 vehicles, including two ADA, and a portable rest room. This site occupies PacifiCorp and BLM ownerships and is within the Project Boundary.

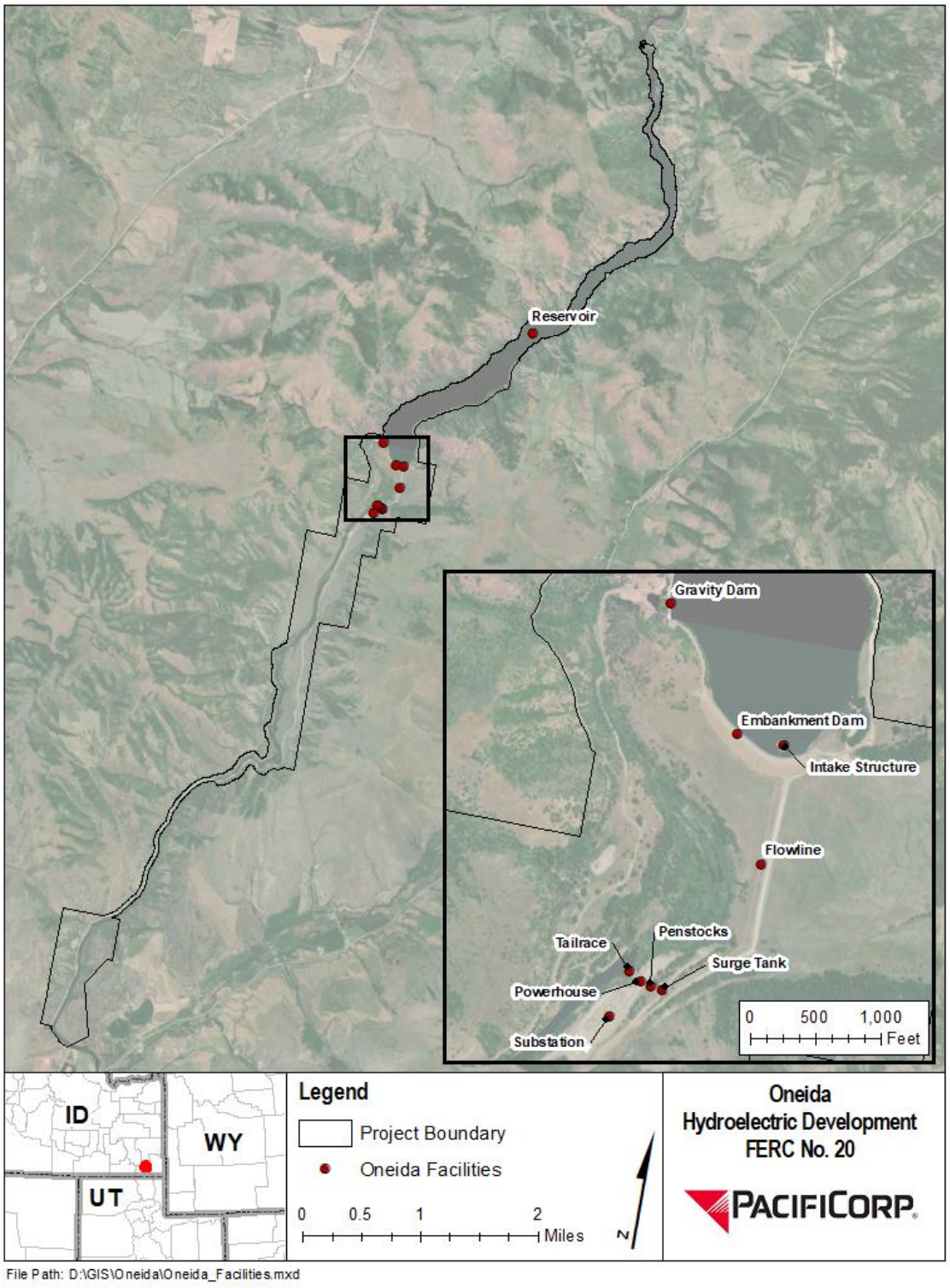


Figure 3.2-1. Location of the facilities at the Oneida Development.

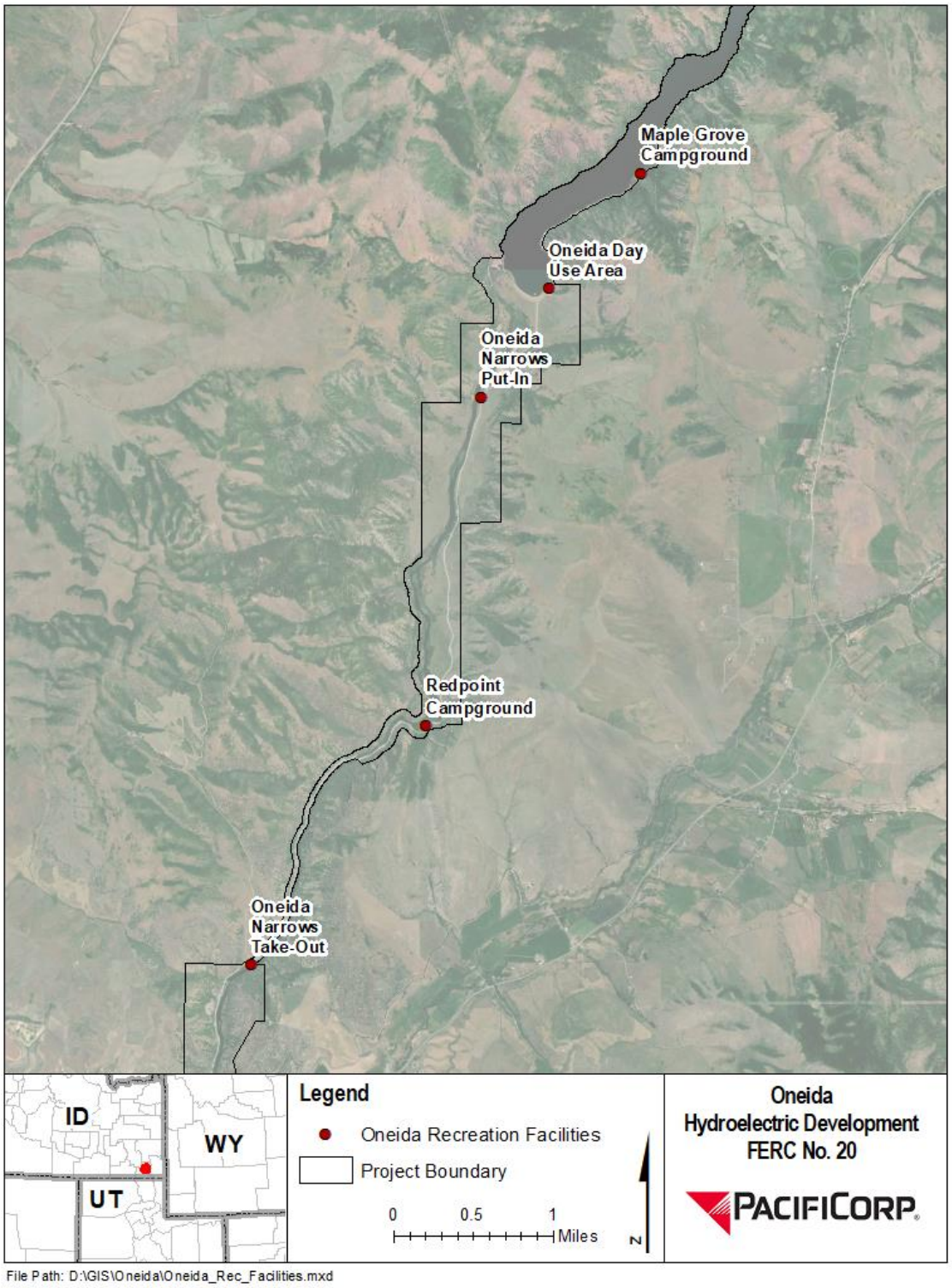


Figure 3.2-2. Location of the Oneida Development's recreation facilities.

3.3 DESCRIPTION OF EXISTING PROJECT OPERATIONS

The Bear River Project is operated by PacifiCorp to meet irrigation demands and generate power. The three developments are typically operated in a modified run-of-river mode, with generally smaller differentials between inflow and outflow at the developments. During the irrigation season (April through October) flows in the Bear River through the Bear River Project are largely influenced by water releases from the Bear Lake Facilities (Figure 3.1-1). Under modified run-of-river operations some flow shaping occurs downstream of the Soda and Oneida developments to accommodate irrigation demands and license required boater flows. The Bear River Project is operated to maintain reservoir water levels and minimum instream flow requirements during the non-irrigation season.

Because the proposed Oneida Pumped Storage Facility would not affect operations of the Soda and Grace developments, existing operations of the Oneida Development are discussed in more detail below.

3.3.1 Existing Operations of the Oneida Development

During the summer and irrigation period, the water surface elevation of the Oneida Reservoir is normally held between 4,879.00 and 4,882.40 feet USGS to accommodate releases from Bear Lake and will typically vary two to four feet below the normal operating full pool of 4,882.40 feet USGS. PacifiCorp is contractually obligated to provide irrigation deliveries from Bear Lake to the irrigators. Aside from leakage into the bypassed reach, the year-round minimum flow requirement of 250 cfs and all other releases are made through the Oneida Development's powerhouse. In addition, from Memorial Day to Labor Day, PacifiCorp complies with a recreation goal flow requirement downstream of the powerhouse by providing flows greater than 900 cfs if available from irrigation releases.

Reservoir drawdowns for maintenance are typically performed in the fall after the conclusion of the irrigation season. Typically, maintenance drawdowns are kept to approximately the gated spillway sill elevation at 4871 feet USGS and water is passed through the powerhouse. Drawdowns can be conducted lower than the gated spillway crest.

During spring run-off, the spill gates are used to pass all inflow that exceed the powerhouse's hydraulic capacity of 3,290 cfs.

The Oneida Development also operates under a year-round descending ramping rate restriction of 2 feet per 15 minutes. PacifiCorp monitors this ramping rate at USGS gage No. 10086500 (Oneida Gage), now operated by PacifiCorp.

3.4 SUMMARY OF EXISTING PROJECT GENERATION, OUTFLOW AND DEPENDABLE CAPACITY

At full capacity, with inflow equaling the maximum station discharge of 3,290 cfs, the Oneida Development has the capability of producing 30 MW of electricity. Table 3-1 provides the monthly, annual, average monthly, and average annual energy production at the Project from 2018 through 2022. From 2018 through 2022, the five-year average annual generation was

37,450 megawatt-hours (MWh), and the average monthly energy production ranged from 1,159 to 5,848 MWh.

Table 3-2 provides monthly Oneida outflow records for the past five years (2018 through 2022) based on mean daily flows recorded at the Oneida Gage. These flow records were not prorated to account for the intervening drainage as the Oneida Gage is about 0.3 river miles downstream of the Oneida Development tailrace. There are no tributaries between the Oneida Dam and the Oneida Gage, and the drainage area upstream of the Oneida Dam represents 99.98 percent of the drainage area at the Oneida Gage (4,456 square miles). Therefore, unadjusted flows recorded at the Oneida Gage are likely representative of Oneida Development's outflow. Over the five-year period of flow records analyzed, the average annual mean daily outflow at the Oneida Development ranged from 532 to 909 cfs and averaged 707 cfs. Average monthly mean daily flows ranged from 395 to 1,097 cfs. The lowest and highest mean daily flow recorded over the five-year period were 271 and 1,846 cfs, respectively. Based on mean and median monthly mean daily flows, the lowest and highest flow are typically observed in November and July, respectively.

Dependable capacity is the amount of power a project can reliably produce at any point in time should the need arise. Given that the Oneida Development is operated in a modified run-of-river mode, generation depends on inflow. According to the outflow records described above, flows in the Bear River are typically lowest during the month of November; thus, November would be the time of year when the amount of power the Oneida Development can reliably produce would be most limited. As shown in table 3-1, the average amount of energy produced by the Oneida Development during November was 1,159 MWh. Therefore, the dependable capacity of the Oneida Development is approximately 1.6 MW.[2] The average annual plant factor is about 14.3 percent.[3]

[2] Equals 1,159 MWh divided by 720 (number of hours in the month of November).

[3] Annual plant factor is the ratio of the electricity produced by a generating facility during one year to the electricity the generating facility could have produced if it had been operated at its rated capacity throughout the same year. The average annual plant factor is calculated as the average annual generation divided by the nameplate capacity (30 MW) multiplied by 8,760 hours per year ([average annual generation ÷ (nameplate capacity × 8,760 hours)]).

Table 3-1. Monthly, annual, average monthly, and average annual energy production at the Oneida Development, 2018-2022.

Month	Generation (MWh)					
	2018	**2019**	**2020**	**2021**	**2022**	**Average**
January	8,891	1,715	3,163	936	633	2,556
February	8,263	1,784	3,893	1,036	432	2,568
March	8,402	2,426	8,793	1,512	1,123	3,709
April	5,623	7,692	4,964	1,664	2,539	3,747
May	3,499	5,831	3,896	3,852	1,205	3,047
June	5,029	5,312	4,220	6,791	2,345	3,949
July	7,203	6,356	7,085	6,194	8,251	5,848
August	7,176	8,164	7,542	3,669	5,306	5,310
September	3,684	5,062	3,317	1,197	4,087	2,891
October	1,902	2,741	1,966	774	830	1,369
November	1,620	2,256	1,510	882	686	1,159
December	1,858	3,430	1,195	675	616	1,296
Total	63,150	52,770	51,542	29,184	28,052	37,450

Table 3-2. Monthly and annual summaries of outflow from the Oneida Development for calendar years 2018–2022.

Month/ Year/ Statistic	Flow (cfs)					
	Minimum	25th Percentile	Mean	Median	75th Percentile	Maximum
Monthly						
January	281	372	620	418	633	1,530
February	276	381	656	461	868	1,558
March	290	442	799	554	1,276	1,846
April	400	584	843	787	1,028	1,748
May	287	530	712	722	880	1,387
June	284	545	847	806	1,117	1,531
July	550	935	1,097	1,122	1,282	1,415
August	330	873	1,017	1,107	1,207	1,313
September	284	442	658	653	878	1,129
October	273	316	419	394	457	1,020
November	271	332	395	389	436	648
December	284	309	418	390	453	755
Maximum	550	935	1,097	1,122	1,282	1,846
Minimum	271	309	395	389	436	648
Average	318	505	707	650	876	1,323
Annual						
2018	909	955	1,846	281	477	1,256
2019	717	633	1,748	287	446	900
2020	787	713	1,704	346	494	1,011
2021	592	446	1,531	271	328	789
2022	532	357	1,408	273	301	684
Maximum	909	955	1,846	346	494	1,256
Minimum	532	357	1,408	271	301	684
Average	707	621	1,647	292	409	928

3.5 SUMMARY OF COMPLIANCE HISTORY

Compliance entails a licensee's adherence with the requirements, terms, and conditions specified in its license orders, approved plans, and with Commission rules and regulations. Examples of non-compliance issues at licensed hydropower projects typically involve deviations from minimum flow requirements, reservoir water levels, water quality, and fish passage facility operations (FERC, 2015). In addition, issues of non-compliance also include a licensee's failure to adhere to the filing requirements of license articles (FERC, 2015). Examples of these non-compliance issues include not filing plans or reports by the due date set in the associated license article. A review of the Project record indicates one instance of non-compliance in June 2006 related to Article 30 of the Cove Development; this development has subsequently been decommissioned and its dam removed.[4] No other instance of non-compliance or violations were discovered in the review of the Bear River Project record.

The FERC's Division of Hydropower Administration and Compliance (DHAC) also conducts environmental inspections of licensed and exempted projects to evaluate and assess compliance with the environmental and public use requirements of a license. Environmental inspectors look specifically at a licensee's or exemptee's compliance with license or exemption requirements for the protection and enhancement of environmental resources at the project as well as with the project's public safety plan. Since the current license was issued, DHAC staff performed an environmental inspection at the Project in 2005, 2008, and 2015.[5] DHAC concluded, based on these inspections, that PacifiCorp has operated and maintained the Bear River Project consistent with the license. DHAC staff noted during the 2015 inspections that PacifiCorp needed to follow-up on some updates to signage and recreation site bollard maintenance at the Oneida Development. The Bear River Project record indicates that PacifiCorp promptly resolved these issues noted by DHAC's inspection staff.

3.6 CURRENT NET INVESTMENT

The Federal Power Act (FPA) generally defines a licensee's net investment in a project as the original cost of the project, plus additions and betterments, minus depreciation and other amounts (16 United States Code [USC] § 796 (13)). As of December 31, 2022, the net investment is $45,693,007 for the entire Bear River Project, and $18,225,389 for the Oneida Development.

3.7 PROPOSED FACILITIES

As proposed, the Project would consist of the following new facilities: (1) an upper reservoir with roller compacted concrete dam, two steel penstocks to a pump/powerhouse with two pump turbine generator units with a total rated capacity of 200 MW, another steel flowline connecting the existing tower intake in Oneida Reservoir and a short transmission line to the existing Oneida substation. Note: Idaho water right applications will have higher estimated quantities due to the preliminary engineering available at this time.

4 See Accession No. 20060727-0102

5 The 2008 Environmental Inspection Report is filed as "Privileged" (see Accession No. 20080820-0280).

The proposed upper reservoir site is located on the ridge line between Cleveland Hill and Rocky Peak and about 0.74 miles west of Oneida Dam.

The new upper reservoir would be constructed on high ground approximately 0.7 miles west from the existing Oneida Reservoir. It will be connected via twin 11-ft-diameter penstocks.

This Project is based on an open-loop system. Local run-off into the upper reservoir and dam safety would need to be assessed to confirm if a spillway is required for this Project.

The Project powerhouse is proposed as an above ground facility located south of the existing Oneida Dam on the right bank of the Bear River. The powerhouse would be equipped with two pump-turbines for generation and pump return to the upper reservoir via the penstocks. Figure 3.7-1 shows the general configuration of the principal facilities of the Project.

3.7.1 Oneida Pumped Storage Facility

Dam

Upper Reservoir Dam

The proposed upper reservoir dam would be roller compacted concrete that has a maximum height of approximately 315 feet, and crest elevation of 6,040 feet msl to provide a 10-ft freeboard on the maximum water level (6,030 ft). The downstream slope of dam would be 0.67 horizontal to 1 vertical (0.67:1) and have a top width of 15 feet. The total length of the dam would be approximately 2,119 feet. At this time, it is assumed the dam height would be sufficient to contain the water volume associated with an over-pumping event as well as a probable maximum flood event, such that no spillway is expected to be required; future engineering studies are to confirm this assumption.

Lower Reservoir Dam

The lower reservoir dam would be the existing Oneida Dam as described above in section 3.2.3 *Oneida Development*.

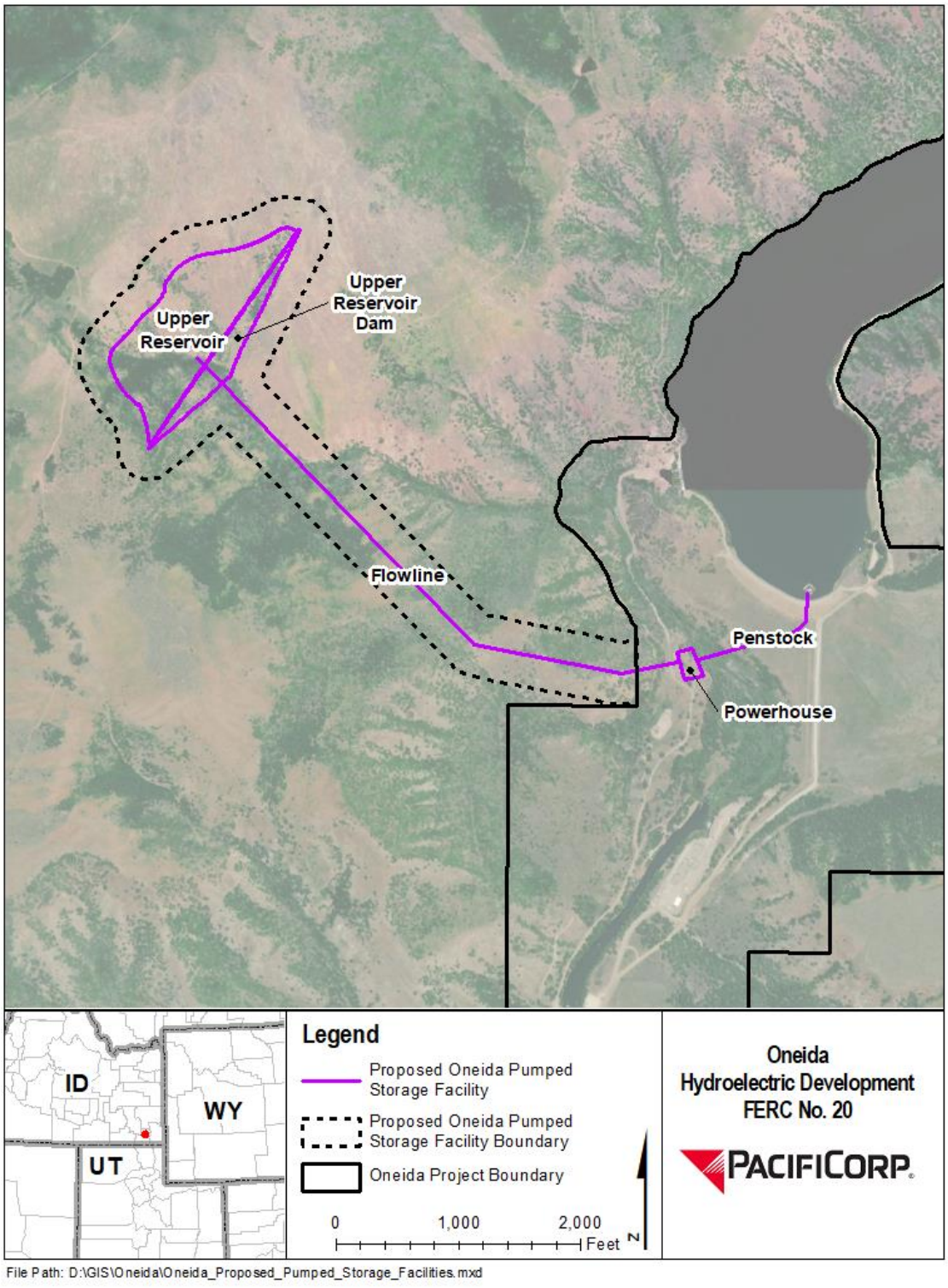


Figure 3.7-1. General configuration of the principal facilities of the proposed Oneida Pumped Storage Facility.

Reservoir

Upper Reservoir

The normal maximum water surface area of the upper reservoir would be 23 acres at the normal maximum water surface elevation of 6,030 feet msl. The upper reservoir would have approximately 2,127 acre-feet of available active storage.

Lower Reservoir

The lower reservoir would be the existing Oneida Reservoir as described above in section 3.2.3, *Oneida Development*.

Tunnels, Penstocks, and Pipelines

Upper Reservoir to Powerhouse

Water would be conveyed between the upper reservoir and the powerhouse via two, 11-ft diameter penstocks each approximately 5,800 ft. long. Downstream of the new powerhouse, a new intake/tailrace pipeline would connect just downstream of the existing intake, where there is an existing capped auxiliary intake. A new bridge to carry the pipelines over the existing Oneida Development bypass channel would be constructed. An outlet will also be provided into the bypass channel to enable the new pipelines to be fully drained for maintenance. During the pumping stage, water would be drawn from the existing intake within Oneida Reservoir and would be pumped to the upper reservoir.

Powerhouse

The proposed powerhouse would be above-ground powerhouse on the right bank of the Bear River, just north of the old worker housing site. It would be kept clear of the existing bypassed channel. The powerhouse would house two 100-MW Francis pump-turbine units. The access road to the powerhouse would be a short extension from the existing road into the former worker housing site.

Pump/Turbine Generator

The pump-turbine and generator units are based on a pre-dimensioning design provided by a generation equipment manufacturer. The rated power of each proposed pump-turbine is 100 MW for a rated gross head of 1,200 ft. The inlet diameter of the runner would be of 10.7 ft and the outlet diameter would be of 5.8 ft. The minimum submergence for this pumping equipment is 180 ft for single-stage units. However, given the topography around Oneida Dam, the actual submergence would require the use of double-stage pumping units.

Substation – New Powerhouse

The new powerhouse substation would be located adjacent the powerhouse and contain (1) two 138/15 kV generator step-up transformers; (2) three ring bus 1200-amp circuit breakers (3) station service transformer.

The new powerhouse substation would be connected to the existing Oneida Development substation described above in section 3.2.3 *Oneida Development*.

Transmission Line

A 0.5 mile-long, 138-kilovolt (kV) transmission line connecting the new powerhouse substation to PacifiCorp's existing Oneida substation. The substation would be the point of interconnection with PacifiCorp's existing transmission grid.

Access Roads

Where there are no existing roads, permanent and temporary access roads will be needed. The locations of access roads for construction and long-term operation of new facilities will be the subject of future engineering, environmental and ownership evaluations.

Appurtenant Facilities

Other items related to operation of the proposed Oneida Pumped Storage Facility are: (1) generator breakers; (2) three- phase station service transformer; (3) three phase station service back-up transformer; (4) DC battery banks; (5) emergency generator, and (6) other storage, maintenance, and garage buildings.

3.8 PROPOSED PROJECT OPERATIONS

PacifiCorp proposes to operate the Project as an open-loop pumped storage project. The proposed development will operate in a pumping mode moving water from the lower to upper reservoir in consideration of forecasted grid/customer demand and market conditions. It would generate when market conditions are unable to meet the electrical demand of the region and pricing is favorable, thus providing the stored energy into the grid. Generation would occur when water is released from the upper reservoir, passed through the powerhouse and into Oneida Reservoir.

The upper reservoir would fluctuate water levels between 5,915 and 6,030 msl, moving approximately 2,127 acre-ft of water. This amount of water would be suitable to provide at least 10-hours of continuous generation at the Project's proposed maximum generating capacity of 200 MW. The Oneida Reservoir water levels would fluctuate 5-6 ft between the normal operating range L.W. 4,876.4 and H.W. 4,882.4 msl.

While in pumping mode, the Project's maximum hydraulic capacity would be approximately 2,030 cfs. While in the generation mode, the proposed Project's discharge would be up to 2,550 cfs into Oneida Reservoir. PacifiCorp estimates that the proposed Project would operate in the pumping mode between 45 to 55 percent of the time, and in the generation mode between 35 to 45 percent of the time.

3.9 EXISTING AND PROPOSED PROJECT LANDS AND WATERS

The Project would require an expansion of the Oneida Project Boundary to encloses all lands and waters necessary for operation, maintenance, and special purposes (i.e., recreation, protection of environmental resources). The Project lands and waters would encompass the proposed facilities

described above in section 3.7 *Proposed Facilities*. The proposed expanded Oneida Project Boundary would include a 250 foot buffer around the proposed upper reservoir and a 250-foot buffer around the proposed penstocks. The existing Oneida Project Boundary for the Oneida Development is included in Appendix C.

Both the Project Boundary and required expansion would occupy federal (BLM and Bureau of Reclamation [BOR]) and private lands (Table 3.9-1 and Figure 3.9-1). Neither the existing Project Boundary nor the proposed expansion would occupy tribal lands.

Table 3.9-1 Land ownership within the existing Oneida Project Boundary and the proposed Oneida Pumped Storage Facility boundary.

Landowner	**Oneida Project Boundary**		**Proposed Oneida Pumped Storage Facility**	
	Area (acres)	**Percent**	**Area (acres)**	**Percent**
BLM	82.9	5.2	0.0	0.0
BOR (managed by BLM)	469.9	29.5	33.4	30.7
Private (non-PacifiCorp)	2.7	0.2	75.4	69.3
PacifiCorp	1,039.7	65.2	0.0	0.0
TOTAL	1,595.3	100	108.8	100

3.10 SINGLE-LINE DIAGRAM

A single-line diagram that shows the transfer of electricity from the Project to the transmission grid will be provided in the final license amendment application. Single-line diagrams, however, are considered to be Critical Energy/Electric Infrastructure Information; therefore, the single line diagram for the proposed project would be filed as such with the Commission.

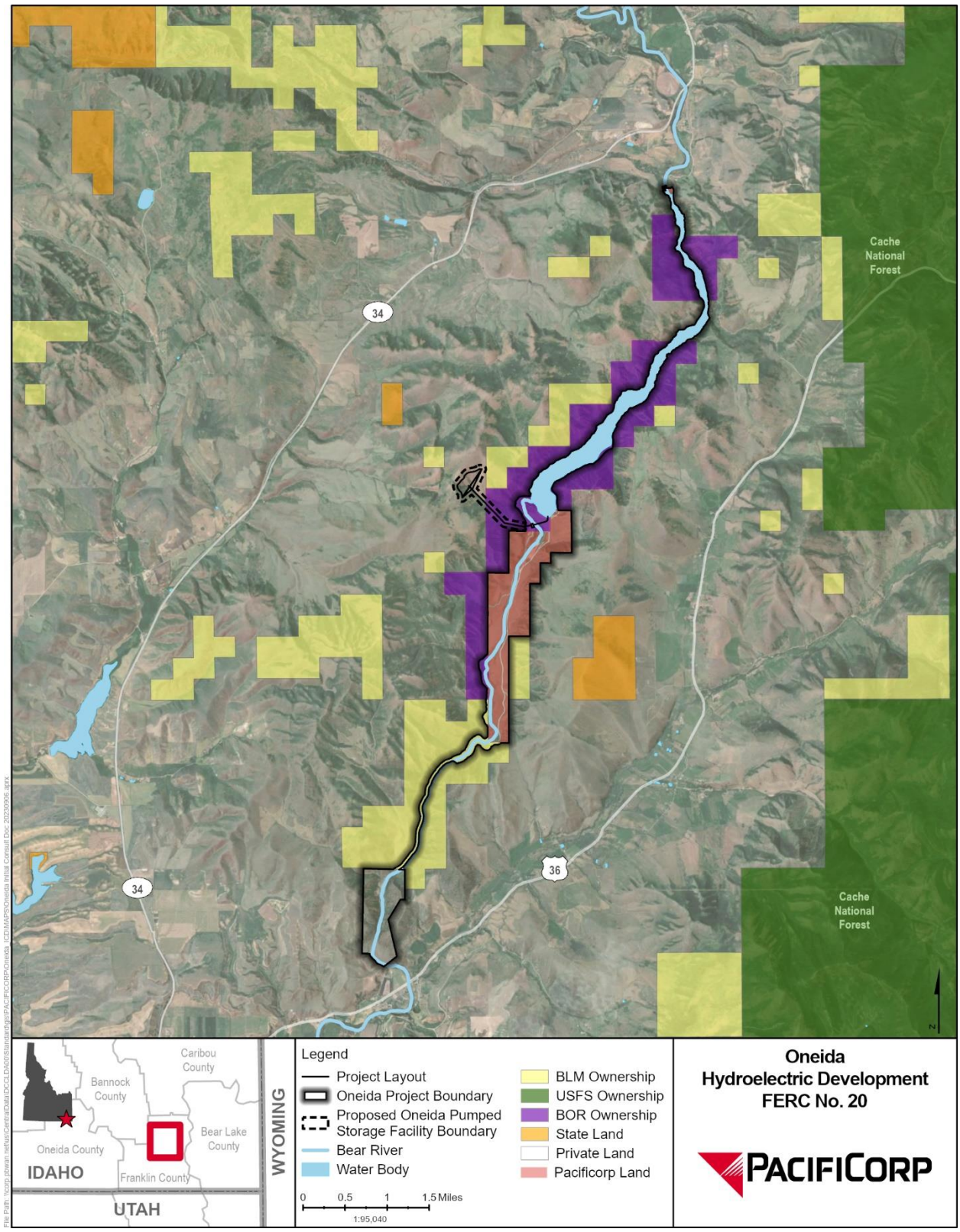


Figure 3.9-1. Landownership in the vicinity of the Oneida Proposed Pumped Storage Facility.

4.0 DESCRIPTION OF EXISTING ENVIRONMENT AND RESOURCE IMPACTS

Pursuant to 18 CFR § 4.38(b)(2)(iv), this section includes the identification of the environment to be affected, and describes significant resources present at the Bear River Project. The environmental analysis provided herein is based on information filed with PacifiCorp's Final License Application (1995a), information developed during implementation of the license, information expressly obtained for the purposes of this license amendment process, and other appropriate information developed or obtained by PacifiCorp as cited. The description of the existing environmental and discussion of resource impacts is limited to the proposed action, thus the area within and around the Project and the Oneida Development. Changes to the environment and updated information are provided when applicable.

4.1 GENERAL DESCRIPTION OF THE RIVER BASIN

4.1.1 Overview

The Bear River originates in the Uinta Mountains in Utah and flows in a northerly direction through western Wyoming and then into southeastern Idaho, where it makes a U-turn and flows in a southerly direction, eventually recrossing the Utah border and discharging into the Great Salt Lake. It is a significant river system that poses various challenges in terms of management, regulation, and usage due to its diverse geographic coverage (Utah DWR n.d.). The Bear River drains an area of about 7,500 square miles, split among 2,700 square miles in Idaho, 3,300 square miles in Utah, and 1,500 square miles in Wyoming, and has a length of approximately 500 miles (Figure 4.1-1). Elevations range from 4,200 feet at Bear River Bay where the Bear River enters the Great Salt Lake, to 6,700 feet near Evanston, Wyoming, in the Upper Bear River Valley.

The Bear River is the primary freshwater source flowing into Great Salt Lake and is therefore vital to the existence of Great Salt Lake ecosystems. It is the largest tributary to the Great Salt Lake and is the largest stream in the North American Continent that does not flow into an ocean. It supports many wildlife and fish species (see section 4.5) such as the greater sage-grouse, Bonneville cutthroat trout and northern leatherside chub. The Bear River watershed's wetlands serve as an important hub for millions of migratory birds traveling along the Pacific and Central Flyways.

For the first 20 miles of its course, the Bear River flows down the north slopes of the Uinta Mountains in Utah. Then, at the Wyoming boundary, it enters the first of a series of five major valleys that extend along the remainder of its course. The valleys are separated by narrow canyons or gorges, some of which contain hydroelectric power developments. Bear Lake, a natural lake, but important offstream storage reservoir, is centrally located within the watershed, Bear Lake County, Idaho and Rich County, Utah. The lake is 19 miles long from north to south, 7.5 miles wide from east to west, and has a surface area of 110 square miles.

The highest and longest valley in the Bear River watershed is the Upper Bear River Val1ey, centered around the town of Evanston, Wyoming. The upper valley extends about 100 miles, roughly along Wyoming's western boundary with Utah and Idaho. The valley is narrow, with its bottom lands 5 miles or less in width. In addition to Evanston, communities in the valley include

Cokeville, Wyoming, and Randolph and Woodruff, Utah. The Woodruff Narrows Dam and reservoir is located in this valley.6

A few miles downstream of its point of entry into Idaho, the Bear River flows westward into Bear Lake Valley, which is about 50 miles long and has a maximum width of 12 miles (Figure 4.1-1). Bear Lake lies at the south end of the valley. Mud Lake Regulation Reservoir is at the north end of Bear Lake. The river does not flow naturally into these lakes but is connected via inlet and outlet canals on the north end of the lakes, constructed in 1902. Bear Lake and Mud Lake Regulation Reservoir provide virtually complete control of Bear River flows. The Lifton Pumping Plant, operational in 1917, pumps water from Bear Lake into the Outlet Canal. Valley bottom lands north of Bear Lake are generally irrigated by diversion from Bear River, while some of the arable bench lands on each side of the valley are irrigated from the many inflowing tributary streams. Idaho communities in Bear Lake Valley include Montpelier, Dingle, St. Charles, Fish Haven, Bloomington, Paris, Liberty, Pennington, and Georgetown. Utah communities include Pickleville, Garden City, and Laketown.

The 220 miles of the Bear River downstream of Bear Lake are controlled by a series of storage reservoirs, diversion dams, canals, and hydroelectric plants. Leaving Bear Lake Valley at the north, the river flows through several miles of hilly and broken grazing lands and lava plains and thence through a deep, narrow channel cut through a lava flow near Soda Springs, Idaho. Located in this channel is the Soda Development, the most upstream of the hydroelectric projects on the Bear River, located 5 miles west of the city of Soda Springs in Caribou County, Idaho. Alexander Reservoir extends about 4.5 miles upstream of Soda Dam. The drainage area upstream of the Soda Development is about 4,100 square miles, based on the USGS gage located downstream of the dam.

From the Soda Development, the Bear River begins flowing south and into a broad agricultural area known as Gem Valley. Four miles downstream of the Soda Development, the Last Chance Diversion Dam diverts water from the Bear River into the Last Chance Canal. The northern and central portions of Gem Valley consist of a plain formed by a lava flow and are occupied by large dry farms with some irrigation from Bear River and other inflowing streams. The southern part of Gem Valley, south of Grace, Idaho, and beyond the lava flow, is about 500 feet lower in elevation than the central portion. This lower portion is also known as Gentile Valley and the extreme southern portion as Mound Valley. The abrupt drop of the Bear River into Gentile Valley is utilized for power generation at the next dam downstream, the Grace Development. The Grace Dam diverts water into an approximately 6-mile-long flowline to the Grace Powerhouse, which bypasses a 6.6-mile-long reach of the Bear River before combining with discharges from the Grace Powerhouse.

At the south end of Mound Valley, the river enters the Oneida Narrows, a canyon about 11 miles in length, where the Oneida Development is located. Oneida Narrows is approximately the midpoint of the river in the sense that inflows upstream and downstream of the narrows are nearly equal.

6 Woodruff Narrows Dam and reservoir are owned and operated by the Woodruff Narrows Reservoir Association for the primary purpose of irrigation.

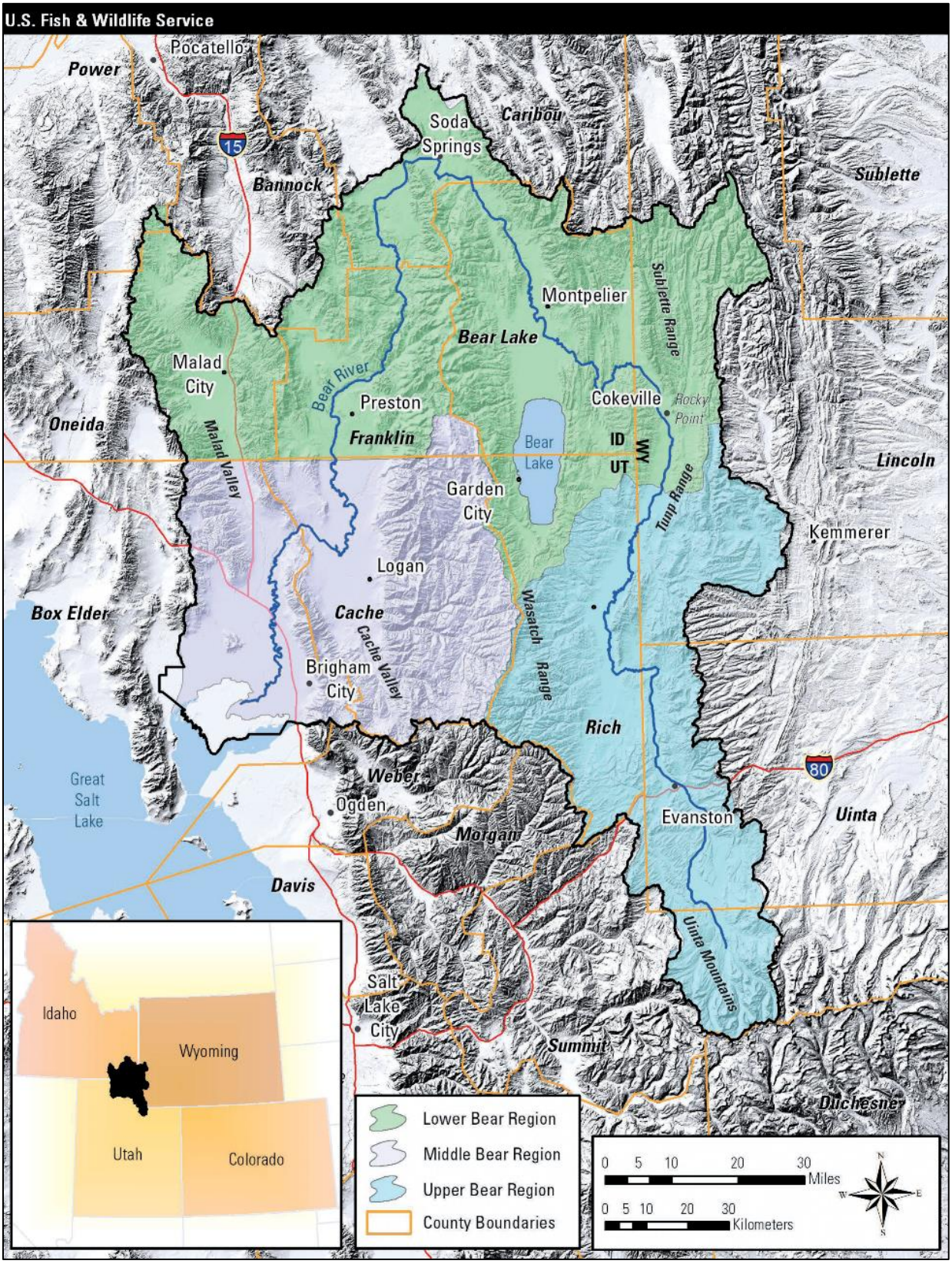


Figure 4.1-1. Overview of the Bear River watershed (Source: FWS, 2013)

As described in section 3.1, the Oneida Development is located in Franklin County, Idaho, about 6 miles south of Cleveland, Idaho. The drainage area upstream of the Oneida Dam is 4,456 square miles, based on the USGS gage downstream of the powerhouse. The Oneida Development has a 0.5-mile-long bypassed reach.

Downstream of the Oneida Narrows, the river enters Cache Valley, one of the more highly developed valleys in the Bear River watershed. Cache Valley is about 45 miles long and 10 miles wide. Among its principal communities are Preston, Dayton, and Franklin, Idaho, and Lewiston, Richmond, Smithfield, Logan, Providence, Hyrum, Paradise, and Wellsville, Utah. The river then enters Cache Valley from the northeast, meanders sluggishly southward down the valley, and exits westward through a 2-mile-long gorge into Lower Bear River Valley, which is a part of Great Salt Lake Valley. Several Bear River tributaries enter Cache Valley from the east and lesser streams from the west. Water of these streams is used for irrigation, particularly on the higher lands near the base of the mountains. The Cutler Hydroelectric Project (FERC No. 2420) is located in the gorge through which Bear River leaves Cache Valley and is the lowest hydroelectric development on the Bear River. The Cutler Hydroelectric Project in Utah is owned by PacifiCorp, and is approximately 44 miles downstream of the Oneida Development.

Downstream of the Cutler Project, the Bear River continues southwest through Lower Bear River Valley to the Bear River Bay of the Great Salt Lake. The Bear River Migratory Bird Refuge is located at the river terminus. Utah communities in Lower Bear River Valley include Garland, Tremonton, Bear River City, and Corinne. The Malad River, flowing southward, enters the Bear River about 10 miles north of Bear River Bay. The Malad River Valley extends northward 80 miles from Lower Bear River Valley. Its principal communities are Malad, Samaria, and St. John, Idaho, and Portage and Plymouth, Utah.

Water rights in the Bear River were delineated through two important decrees: the Dietrich Decree in 1920, and the Kimball Decree in 1922. The decrees quantified and prioritized water rights and defined storage, power, irrigation, and domestic water rights. The decrees were ultimately incorporated into the Bear River Compact, approved in 1955 by the three basin states (Wyoming, Idaho, and Utah). Final ratification by Congress, including a 1978 amendment, occurred in 1980. Idaho DWR considers the river fully appropriated.

4.1.2 Dams and Diversions

The Bear River watershed is managed to provide a stable water supply for irrigated farmland, hydroelectric power generation, recreation opportunities, and habitat enhancements for fish and wildlife. Its numerous dams and diversion canals regulate water flow and facilitate multiple uses. In Wyoming, the upper Bear River is dammed at Chapman Canal, Woodruff Narrows Reservoir, and several other irrigation diversion dams. There are several additional irrigation diversion dams in Idaho that are used for irrigation purposes in hay and pasture lands, and the lower reaches of the Bear River are impounded at Cutler Dam. The discussion below focuses on the major dams associated with Bear Lake and the Bear River Project.

Bear Lake Facilities

PacifiCorp owns and operates the over 100-year-old Bear Lake Facilities. These existing facilities are used by PacifiCorp to divert water from the Bear River and to store and release water from the Bear Lake Reservoir (Bear Lake and the Mud Lake Regulation Reservoir). The Bear Lake Facilities include Stewart Dam, Rainbow Canal Headgates, Rainbow Canal, Ream-

Crocket Canal Intake, Ream-Crocket Canal, Bear Lake Causeway Inlet, Lifton Pumping Station, Outlet Canal, Paris Dike and Outlet Canal Headgates. The Bear Lake Facilities were in place and functioning in 1914 except for the Lifton Pumping Station, which became operational in 1917. In addition to irrigation water storage and delivery, this system allows the management of Bear River water for flood control and power generation.

Prior to the construction of these facilities, a right-of-way over the Bear Lake Reservoir (Mud Lake and Bear Lake) for the storage and conveyance of water was granted by the Secretary of the Interior in 1907. In 1927, the portion of the 1907 right-of-way north of Paris Dike was reduced in size to only cover Outlet Canal. The current footprint of the Mud Lake portion of the right-of-way is 15,487 acres.

Within Mud Lake is the Mud Lake Regulation Reservoir, created by the facilities mentioned above and habitat management dikes built by the U.S. Fish and Wildlife Service (USFWS) as part of its management of the Bear Lake National Wildlife Refuge. The Mud Lake Regulation Reservoir occupies approximately 8,286 acres (in normal operation) within the larger Mud Lake area. During periods of high runoff, the water control structures in the habitat management dikes are opened to allow the full water storage capability of the 15,487 acres of Mud Lake to be used. Normal maximum full pool of the Mud Lake Regulation Reservoir is 5,930.78 feet NAVD88 (maximum flood full pool is 5,931.78 NAVD88).

At the upstream end of this system, water is diverted from the Bear River at Stewart Dam and then conveyed through the Rainbow Canal Headgate and Rainbow Canal to the Mud Lake Regulation Reservoir. Once in the Mud Lake Regulation Reservoir water can be stored, diverted back to the Bear River through Outlet Canal, or moved into Bear Lake through the Bear Lake Causeway Inlet.

PacifiCorp holds water rights from the states of Idaho and Utah to divert the Bear River at Stewart Dam and store diverted Bear River water in the Bear Lake Reservoir. The Applicant has a right to use the stored water for irrigation, power generation, and other beneficial purposes recognized by law.

Soda Development

The average annual flow just downstream of the Soda Development (2018 through 2022) is 642 cfs, with yearly averages ranging from 497 to 875 cfs. Seasonal variation in flow is smaller than many other similar sized river basins. Flows are highest from June through August (the early part of the irrigation season), ranging from 1,600 to 1,900 cfs, and are lowest from October through December, averaging from 460 to 740 cfs. Flow is released from Soda Dam to meet both irrigation demand and power needs. The reservoir elevation varies over a 2-foot elevation band during the summer months. The Soda Development is not operated as a peaking facility but may be drawn down 3 or 4 feet in the spring to provide short-term flow retention capability under high flow conditions. PacifiCorp maintains a minimum flow downstream of the dam of 150 cfs or inflow, whichever is less, and limits ramping rates to 1.2 feet per hour.

The Last Chance canal diversion dam is located about 4 miles downstream of the Soda Development (at the Last Chance diversion dam). The Last Chance Canal diversion is located about four miles downstream of the Soda Powerhouse and is operated by the Last Chance Canal Company. The diversion includes a powerhouse owned and operated by PacifiCorp under a FERC License Exemption Order. The diversion transfers up to 658 cfs of water from the Bear River for irrigation.

Grace Development

The average annual flow downstream of the Grace Dam (2018 through 2022) is 129 cfs, with yearly averages ranging from 36 to 839 cfs. Seasonal variation in flow at the Grace Development is smaller than many other similar sized river basins. Flows are highest from May through August, with averages ranging from 151 to 284 cfs, and are lowest from October through March, averaging from 64 to 116 cfs.[7] Comparing the June through August flow range with that at the Soda Development shows a significant decrease at Grace Dam due to irrigation withdrawals. The Grace Development generally operates in a semi-automatic mode with the Grace forebay ranging between 5,554.20 and 5,554.50 ft msl. The Grace Development operates closer to a strictly ROR (inflow equals outflow) operation than the other hydroelectric projects because of limited storage in the forebay. The Grace bypass reach has a minimum stream flow requirement of 65 cfs below Grace Dam. Five major springs have been identified in the Grace bypassed reach, and spring flows, when combined with Grace dam leakage, result in flows of 40 to 70 cfs at the downstream end of the bypassed reach. Scheduled boater flow releases are provided each year in the Grace bypass reach.

Oneida Development

The average flow just downstream of the Oneida Tailrace at the Oneida Gage from 2018 through 2022 was 707 cfs, with yearly averages ranging from 532 to 909 cfs (Table 3-2). Seasonal flow variation is smaller than many other similar sized river basins. Average daily flows are highest from June through August (averaging near 1,000 cfs) and are lowest from October through December (about 400 cfs).

4.1.3 Drainage Basin's Tributary Streams

The Bear River collects water from several major tributaries upstream of the Project. In Wyoming the Smith's Fork is the second largest tributary, after the Logan River in Utah, which is downstream of the Bear River Project. The interstate Thomas Fork River in Wyoming and Idaho also provides significant inflows. Smaller tributaries in Idaho upstream of the Bear River Project include Montpelier Creek, Georgetown Creek, Stauffer Creek, Bailey Creek, Eight Mile Creek and Soda Creek. Downstream of the Bear River Project, tributaries to the Bear River include Mink Creek in Idaho, the interstate Cub River and Malad River in Idaho and Utah, and the Logan River in Utah. The Blacksmith Fork and the Little Bear join the Logan River before it enters Cutler Reservoir. A significant quantity of return flow from irrigation diversions, and ground water also flows to the river system.

4.1.4 Major Land and Water Uses

The Bear River watershed encompasses lands used for agriculture and grazing as well as developed lands in areas with rapidly growing populations. Land use alongside the Bear River is primarily agricultural and rangeland, except in the immediate vicinity of the towns of Montpelier, Soda Springs, and Grace, and along steep sections of the river such as Black Canyon

[7] Flow information provide for the Grace Development are summarized from data recorded at the Grace Gage, approximately 0.2 river miles downstream of Grace Dam; therefore, represent flows within the Grace Development's bypassed reach.

and Oneida Narrows. Figure 4.1-2 shows the land use/land cover in the Bear River watershed. See section 4.8.8 for details about land use within the Oneida Project Boundary.

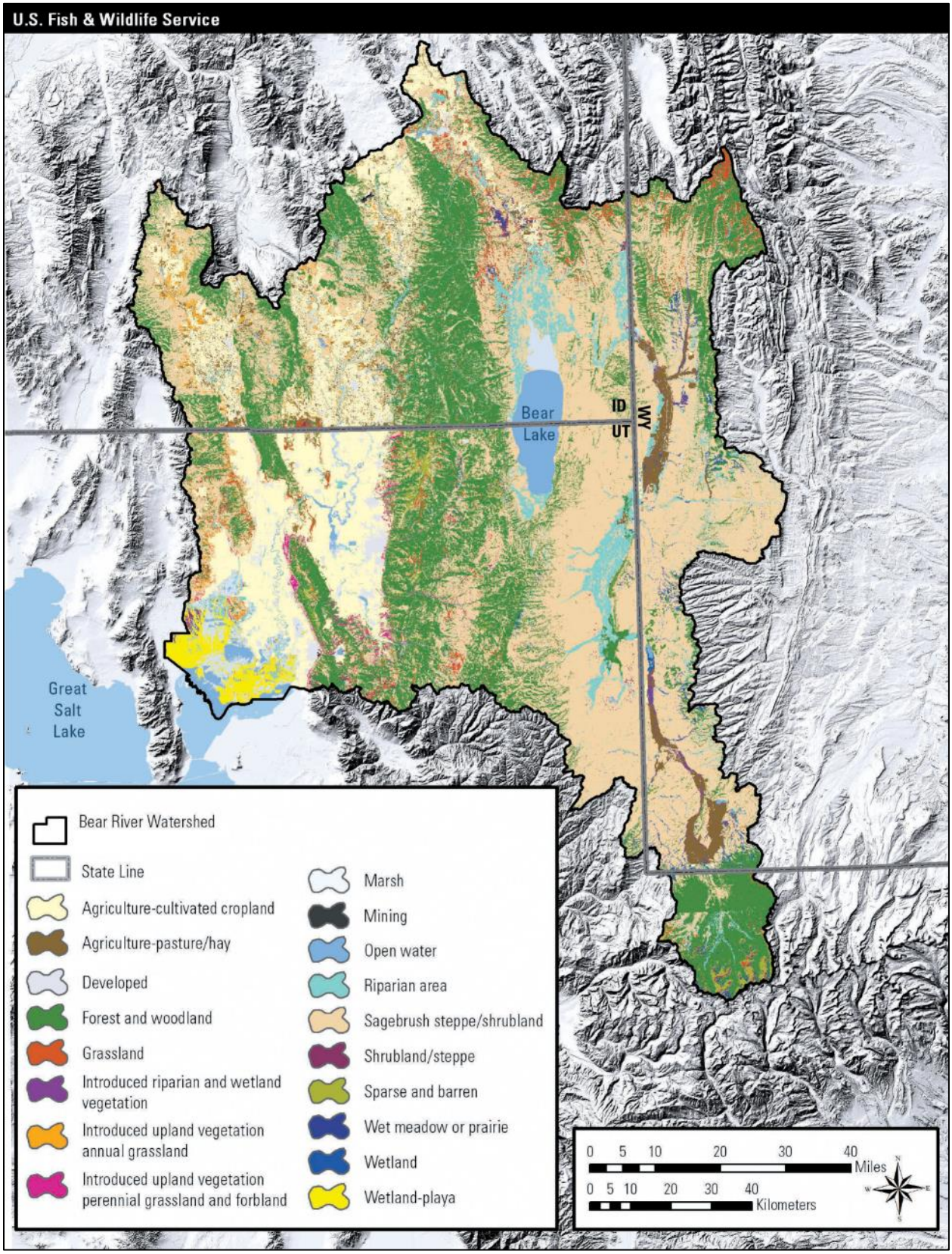


Figure 4.1-2. Land cover in the Bear River watershed (Source: FWS, 2013)

Major water uses in the basin include agriculture, irrigation, municipal and industrial purposes, power generation, and recreation. Although agriculture accounts for a small percentage of the overall land area of the Bear River watershed, it accounts for the vast majority of the water usage to irrigate hay, pasture, and cropland. While precipitation is generally sufficient for dry farming of hardy crops such as wheat and hay, irrigation is required where a wider variety of crops are grown, and higher yields obtained. Numerous transportation corridors parallel the Bear River. U.S. Highway 30 runs along the east side of the river from Sage, Wyoming, to Soda Springs, Idaho. Idaho Highway 34 runs parallel to the river from Soda Springs to Preston. Smaller roads provide residential, agricultural, rangeland, and recreational access to the Bear River and adjacent lands. A Union Pacific railroad system parallels the west side of the river from the Wyoming border, through Montpelier and Soda Springs, on to Pocatello.

Lands adjacent to the Bear River are primarily private, with some BLM- and U.S. Forest Service (USFS)-managed lands adjacent to the river and its hydroelectric developments (Figure 3.9-1). Most forest lands in the Bear River watershed are publicly owned and administered by the Caribou National Forest and Caribou-Targhee National Forest. BLM manages a large mosaic of land across the valley bottom and foothills. Other public lands in the Bear River watershed include the federal wildlife refuges like Cokeville Meadows and Bear Lake National Wildlife Refuge, at the north end of Bear Lake, and a mosaic of state lands scattered through the valley and upland areas.

The primary towns within the Bear River watershed include Evanston, Wyoming; Montpelier, Soda Springs, and Preston, Idaho; and Logan and Brigham City, Utah. Logan, Utah and the Cache Valley, in the lower watershed, is the only urban area. Logan is the county seat and largest city in Cache County, Utah, which had a population of 133,154 as of the 2020 Census. Evanston, Wyoming, in the upper watershed, has a population of approximately 12,000. Montpelier, Soda Springs, and Preston, Idaho have populations between approximately 3,000 to 6,000. Several other small towns with populations under 1,000 occur throughout the watershed and are dependent on agriculture. Further information on the population of Franklin County, Idaho is provided in section 4.12.2.

4.1.5 Climate

The climate of the Bear River watershed is characterized as semiarid continental in that winters are cold and snowy, and summers are warm to hot with little rainfall. Precipitation is heaviest in the mountainous areas, with much of it occurring as snow during the winter months. Precipitation during the May through September growing season is only about one-third of the annual amount. Average precipitation is about 12 inches per year in the Bear River Basin but varies greatly depending on elevation, ranging from 9 inches in the valleys to over 40 inches in some high mountain areas. The average frost-free season varies from about 45 days in some high mountain valleys to more than 150 days in the Great Salt Lake Valley.

The climate of southeastern Idaho is influenced by prevailing west winds from frontal systems from the Pacific Northwest. The north-south ranging mountains create an uplift effect where rain is concentrated on the windward side of the mountains and a dry “rain shadow” is present on the leeward side. Precipitation is distributed unevenly with regard to both time and area. Most of the water available to the streams, reservoirs, and aquifers in the basin is derived from winter snowmelt. Rainfall that occurs during the relatively short summer growing season typically results from thunderstorms that seldom produce enough rain to satisfy the moisture requirements

of the crops grown on the lowlands. Winters are rather long and are influenced by cold air from the Canadian Arctic, while summers are generally cool and sunny with infrequent rainfall. Daily temperature ranges are about 18°F to 36°F in the winter, and 50°F to 84°F in the summer.

4.2 GEOLOGY AND SOIL RESOURCES

4.2.1 Geology

Franklin County is within the Idaho-Wyoming overthrust belt in the northern part of the Basin and Range geologic province in southeastern Idaho. It is characterized by north-trending normal faults that bound the east sides of the mountain ranges (USGS, 2004). The regional geologic structure consists of north-south trending faulted anticlines. The intensity of the folding increases to the east where it forms the overthrust belt of eastern Idaho and western Wyoming. The Oneida Narrows was carved by the Bear River, which flows to the southwest through the canyon. It is located on the west flank of the Bear River Range, a subdivision of the Wasatch Mountains. The Wasatch Mountains separate the Rocky Mountain physiographic province from the deserts of the Basin and Range Province.

The Project would be located on the ridge line between Cleveland Hill and Rocky Peak northeast of the city of Preston. Site-specific geological data for the Project site was available in the form of boring logs and cross sections from Rollins, Brown, and Gunnel (1984), Harza Engineering Company (1989), Sergent, Hauskinsm and Beckwith (1992), and Kleinfelder (2010). Even though the Project site was not extensively investigated during these exploration programs, the combination of regional mapping and borings logs facilitate a preliminary understanding of the lithology and pertinent engineering and geological information below the ground surface.

The proposed upper reservoir would be located within alluvial fan deposits (QTp) at the surface and sedimentary rock (QTpms/Tsl) formation on the downthrown (south) side of the fault and Brigham Quartzite (pCCb) on the upthrown (north) side. The pCCb dips 35 to 44 degrees to the northeast (Lindsay, 1984).

The penstock is proposed to be an elevated pipeline constructed above the ground surface. At the reservoir, the penstock will start in QTp and then be in QTpms/Tsl as it descends the steep hillside. As the penstock approaches the proposed powerhouse it will be located over landslide deposits and then Basin Fill Boulder Gravels (Qg) at the riverbank and powerhouse. The powerhouse will likely be constructed in Qg.

Active Faults and Seismicity

A detailed site-specific seismic hazard study was previously completed in 2012 for the Oneida Narrows Project and the results can be considered as a preliminary basis for seismic design of the Project (PacifiCorp, 2021). The report indicated general corroboration of the USGS National Hazard Maps with the probabilistic seismic hazard assessment. The total mean peak ground acceleration for a 2,475-year return period event is about 0.27g PacifiCorp (PacifiCorp, 2021)

No mapped, active faults are present within the footprint of the Project. The closest mapped active fault, the East Dayton Oxford Fault, is located 14 miles to the west. Because no active faults are present in the immediate vicinity of the Project, the risk of surface fault rupture is considered negligible.

4.2.2 Topography

The topography of the Project vicinity consists of rounded peaks, steep hillsides and flat valley floors. Elevations range from 4,500 ft near Preston to 9,000 ft at the highest peaks of the Bear River Range. Oneida Reservoir itself is located in a steep sided canyon (Oneida Narrows) which separates Gentile Valley to the north from Cache Valley to the south (see section 4.1.1 Overview). The upper reservoir of the Project would occur at an elevation of approximately 6,000 ft, just south of the highest point in the immediate vicinity known as Cleveland Hill.

4.2.3 Soils

Soil data was obtained from the Natural Resources Conservation Service's (NRCS) Web Soil Survey (NRCS 2023). The soil survey geographic database (SSURGO) is generally the most detailed level of soil geographic data developed by the NRCS's National Cooperative Soil Survey. The SSURGO data identified over 50 soil map units within the area (figure 4.2-1). A description of each soil type can be found in NRCS (2023) Official Soil Series Descriptions and Series Classification. Figures 4.2-1 through 4.2-5 show soils within the current Oneida Project Boundary and area of the Project.

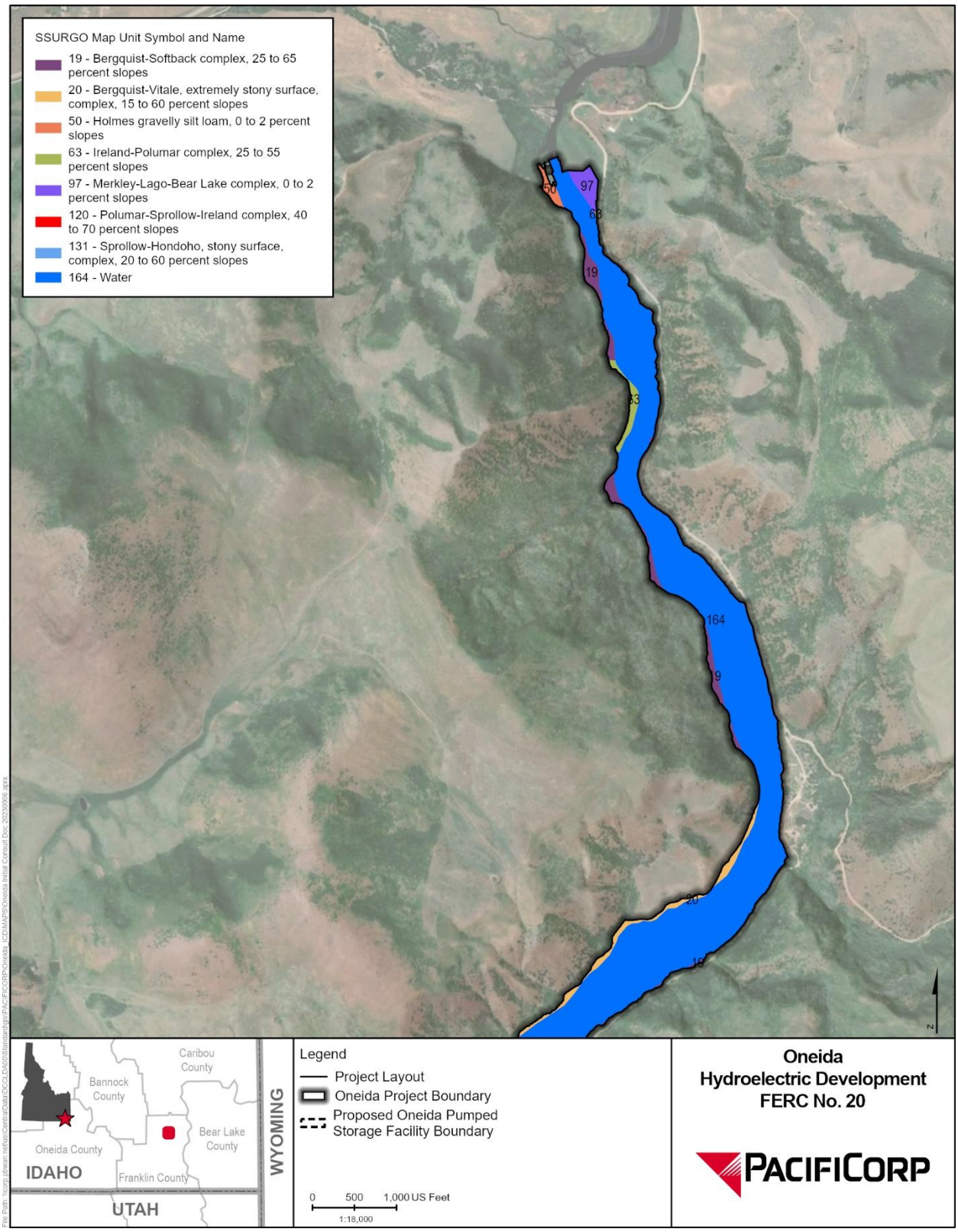


Figure 4.2-1. Soils in and around the existing upper half of the Oneida Reservoir.

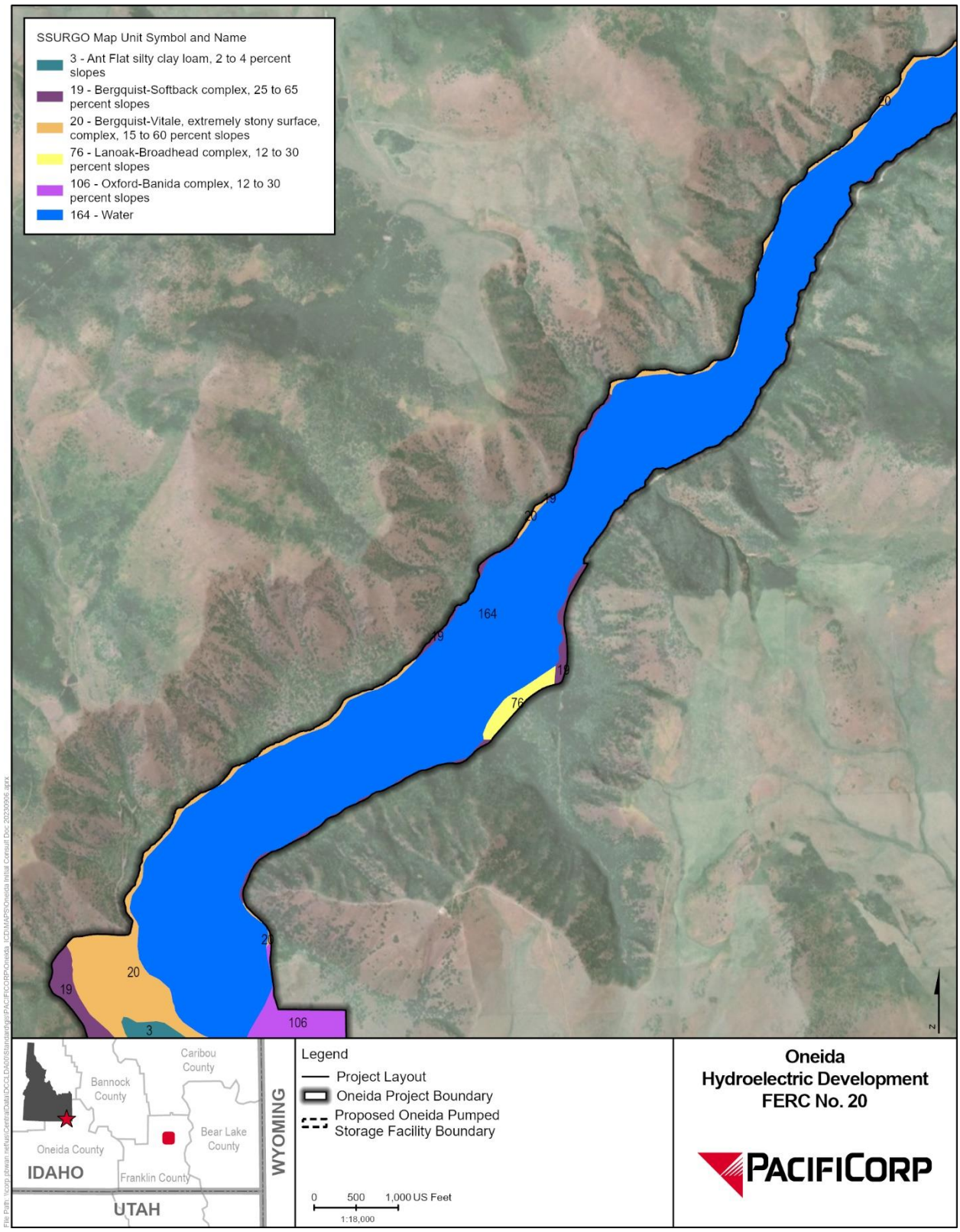


Figure 4.2-2. Soils in and around the existing lower half of the Oneida Reservoir.

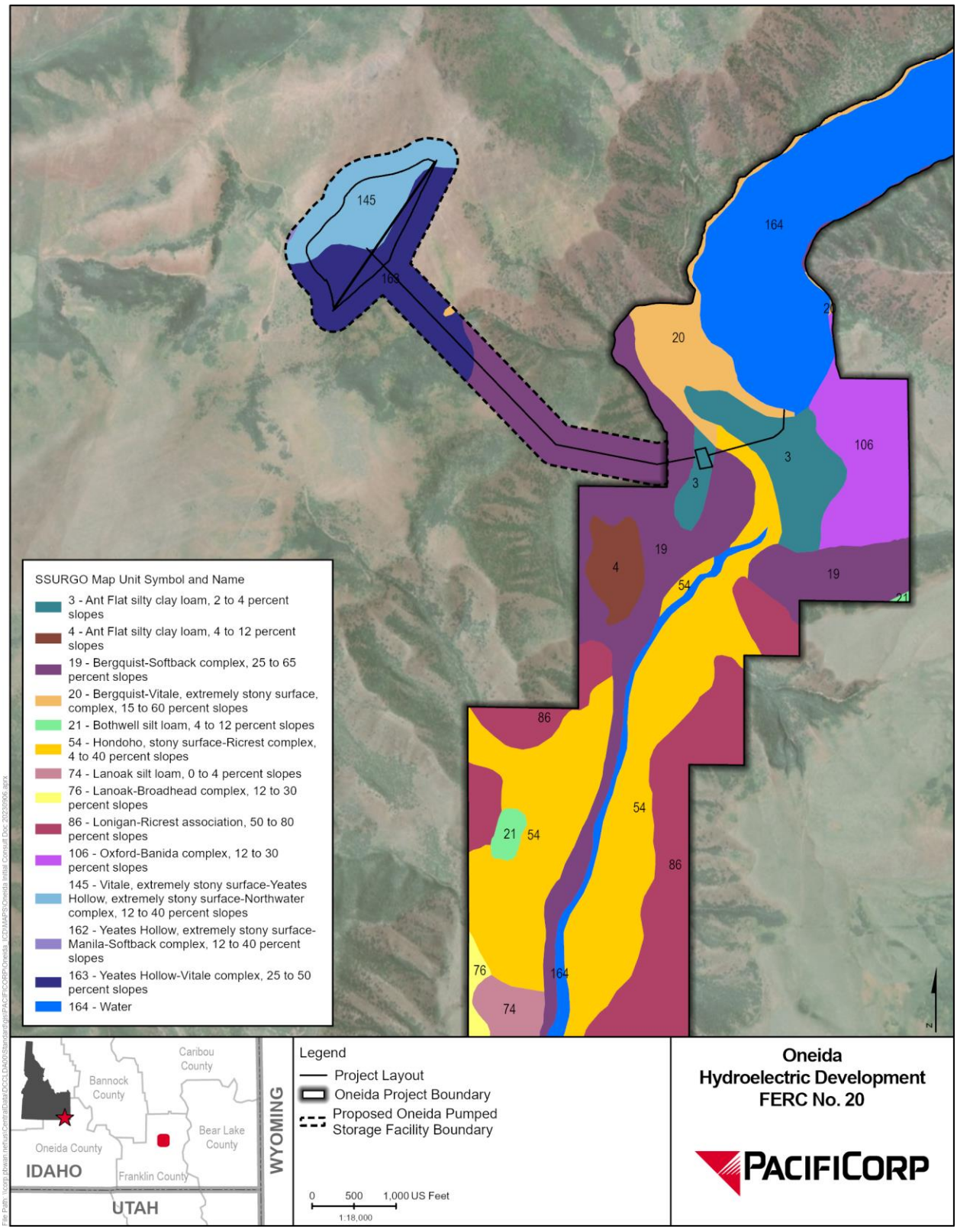


Figure 4.2-3. Soils downstream of Oneida Dam and in the vicinity of the proposed Oneida Pumped Storage Facility.

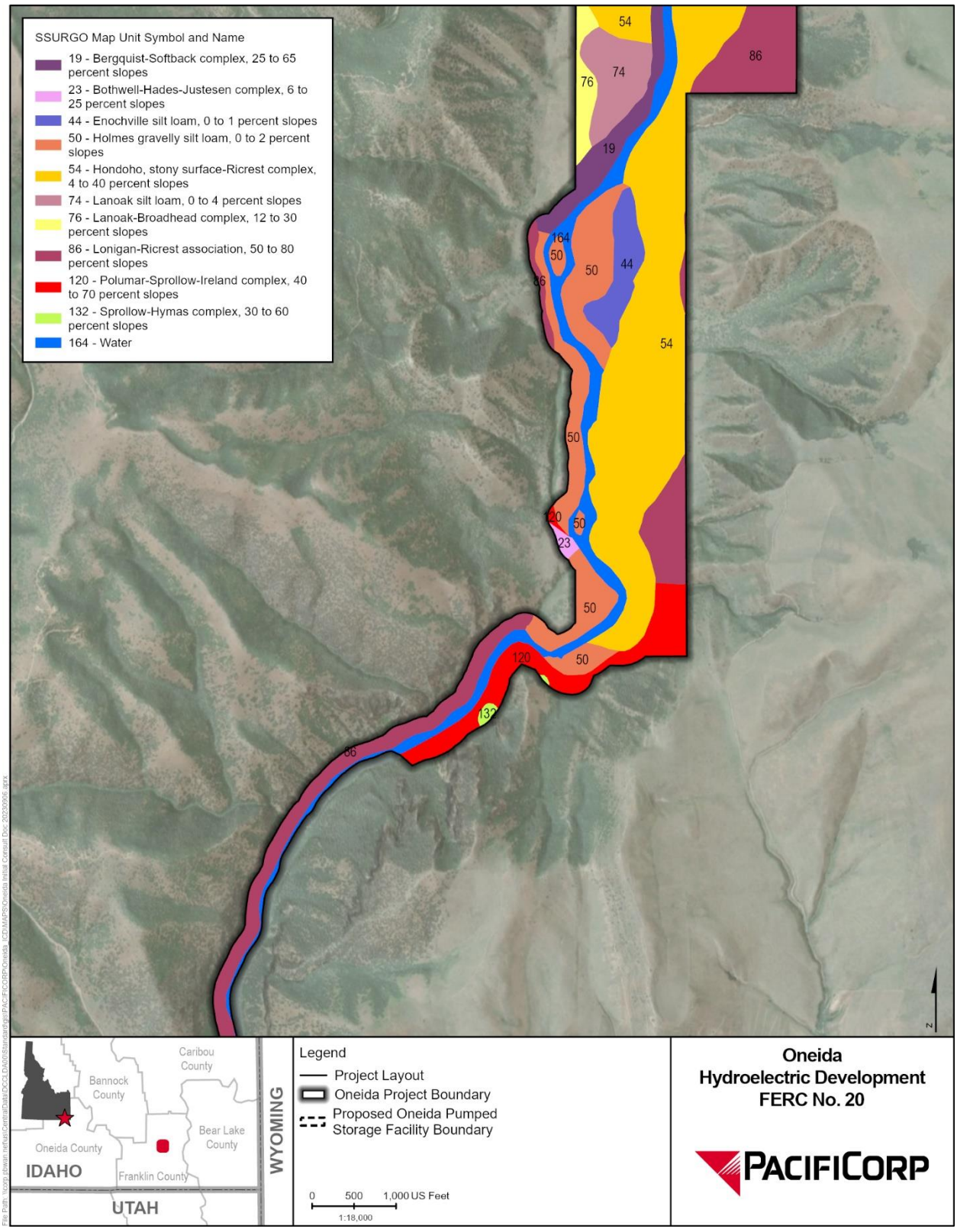


Figure 4.1-4. Soils within and adjacent to the Bear River downstream of the Oneida Dam.

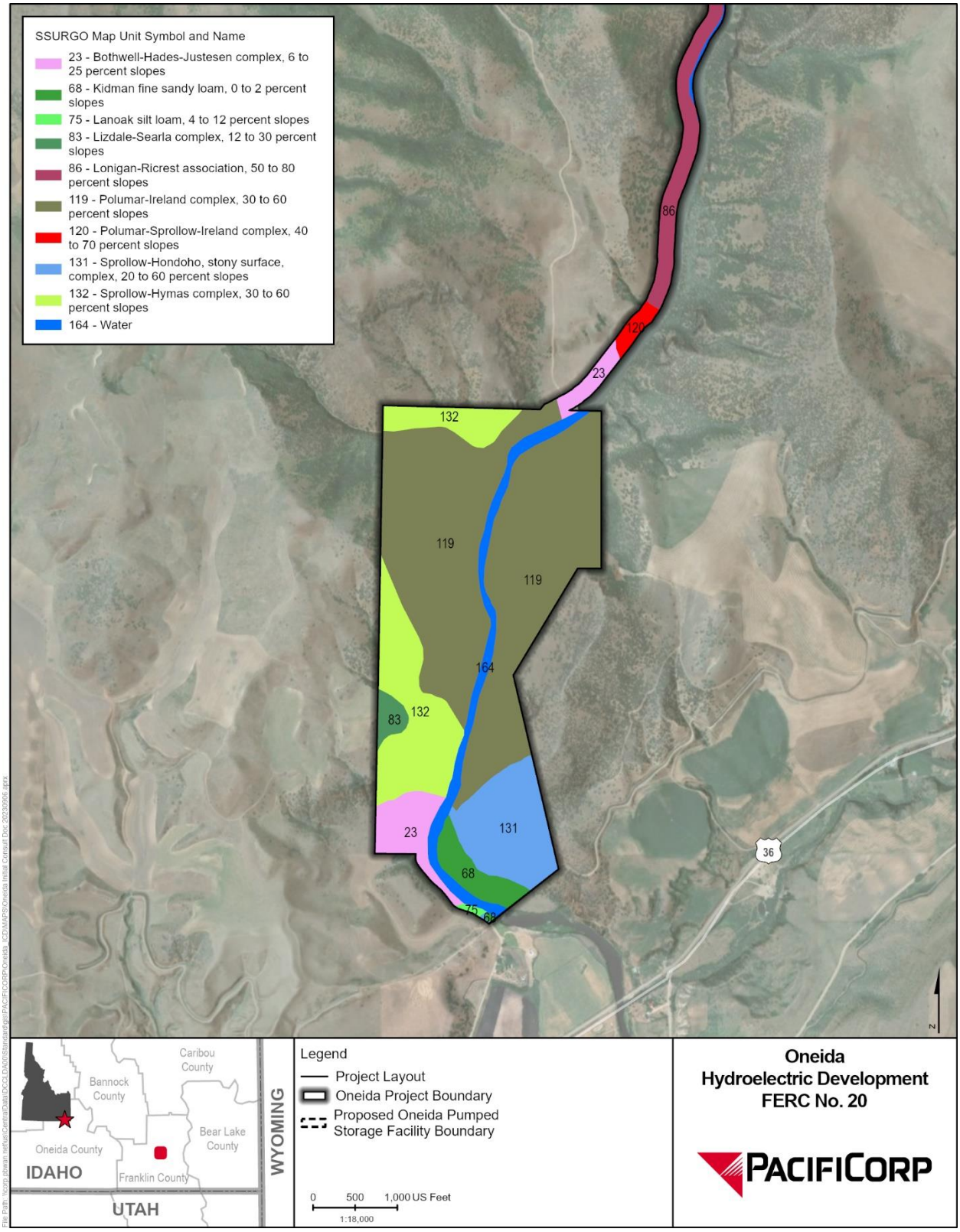


Figure 4.1-5. Soils also within and adjacent to the Bear River downstream of Oneida Dam.

The Yeates Hollow-Vitale complex, Bergquist-Softback complex, and Vitale, extremely stony surface-Yeates Hollow, extremely stony surface-Northwater complex are the most abundant soil types, accounting for roughly 99.6 percent of the proposed Oneida Pumped Storage Facility boundary (Table 4.2-1).

Table 4.2-1. Soils map units, their total area, and erodibility within the proposed Oneida Pumped Storage Facility Boundary.

Map Unit Symbol	Map Unit Name	Area		Erodibility K-factor[a] (Whole Soil)	Erosion Potential[b]
		Acres	Percent		
163	Yeates Hollow-Vitale complex, 25 to 50 percent slopes	44.4	40.8	0.20	Low
19	Bergquist-Softback complex, 25 to 65 percent slopes	32.4	29.8	0.10	Low
145	Vitale, extremely stony surface-Yeates Hollow, extremely stony surface-Northwater complex, 12 to 40 percent slopes	31.5	29.0	0.20	Low
20	Bergquist-Vitale, extremely stony surface, complex, 15 to 60 percent slopes	0.3	0.3	0.15	Low
162	Yeates Hollow, extremely stony surface-Manila-Softback complex, 12 to 40 percent slopes	0.2	0.2	0.20	Low
TOTAL		108.8	100	NA	NA

Source: NRCS 2023

[a] K-factor is an index value that ranges from 0.02 to 0.69 which indicates the susceptibility of a soil to sheet and rill erosion; the higher the value, the more susceptible the soil is to erosion.

[b] Follows Michigan State University, Institute of Water Research (2002), such that K-factor values that range between 0.05 to 0.2 are low, 0.25 to 0.4 are moderate, and those > 0.4 have high erosion potential.

[c] "–" indicates the soil map unit has no K-factor.

4.2.4 Reservoir Shorelines and Streambanks

Shorelines extend for roughly 17 miles around the Oneida Development's reservoir. The majority of the reservoir shoreline is characterized by having abrupt edge bordered by a rock outcropping with slopes 100 percent or greater. Some areas have banks with a moderate-to-low slope less than 50 percent. These forms approximately correspond to the soil map units in Table 4.2-1 that include either stony complexes or silt loam/sandy loam soil types.

The Oneida Development is typically operated as a modified run-of-river, resulting in a water surface that varies seasonally but stays consistent in the short term (i.e., daily or weekly). Typically, reservoir shoreline areas do not experience erosive forces created by fluctuating water levels.

Soils mapped in the Oneida Development have low to moderate erodibility. A shoreline erosion study will be implemented. Goals of the study are to identify and characterize areas of erosion

along the existing Oneida Reservoir shoreline to inform site-specific erosion monitoring. Additionally, the study would discuss the likely causes of shoreline erosion (e.g., high flow, ground water seepage, surface-runoff, livestock grazing, boat wakes/wave action, wind, water level fluctuations).

Where soil extends to the water's edge the shorelines typically support grass and forested cover (figure 4.2-6). Grazing occurs along much of the reservoir shoreline, except for the PacifiCorp lands adjacent to the reservoir, where the rocky and steep topography naturally limit grazing or other uses that would affect shoreline habitats. The edge of Oneida Reservoir is dominated by two habitat types including talus slope with large boulders, and mud flats. Talus and boulder habitat make up about 35 percent of the habitat along the littoral zone of the reservoir (PacifiCorp, 1999).

Figure 4.2-6. Grass and forested cover along Oneida Reservoir.

Upland vegetation (i.e., grass and shrubs) with moderate rooting depth (i.e., greater than 6 inches) dominates the ground surface in most areas near the reservoir. Some reservoir shoreline areas are covered by rocks with limited vegetation (figure 4.2-7). Few wetlands exist within the Oneida Project Boundary. At the north end of Oneida Reservoir, there is a large emergent wetland near the confluence with Cottonwood Creek, other small wetland areas are located along the reservoir shoreline and in the bypassed reach near the powerhouse. Vegetation around the

wetlands is primarily emergent (e.g., bulrush and cattails) and scrub shrub (e.g., willow) wetland, as discussed in detail in Section 4.6. Some forested wetlands occur in areas along the shoreline.

Figure 4.2-7. Oneida Reservoir shoreline with bank armoring around the embankment dam.

4.2.5 Existing Protection, Mitigation, and Enhancement Measures

The existing Land Management and Shoreline Buffer Plan (LMP) provides guidance for the management of PacifiCorp lands, including a framework for better coordinating land management activities with county, state, and federal and other private landowners to minimize adverse effects to natural resources, particularly shoreline and riparian/wetland habitats that are important for aquatic ecosystem functions and wildlife habitat. The LMP is further discussed in section 4.8 Recreation and Land Use.

4.3 WATER RESOURCES

The following water quantity discussion addresses the Bear River Project as a whole, while the subsequent water quality section focuses on the Oneida Development. This is because the water quantity discussion is prepared in support of a potential Bear River Project license term extension request that will be a component of the license amendment application, while the water quality discussion and the rest of resource discussions in this ICD support the proposed license amendment only.

4.3.1 Water Quantity

Hydrology and Streamflow

As detailed in section 3.2, the Bear River Project includes the Soda, Grace, and Oneida developments, all of which are located downstream of Bear Lake in the state of Idaho (Figure 4.3-1; PacifiCorp, 2023). The Last Chance Canal diversion and hydroelectric facility is located between the Soda and Grace developments but is not part of the Bear River Project. The Last Chance Canal Project includes a powerhouse owned and operated by PacifiCorp that is operated under a FERC license exemption order. The Grace Development is downstream of Last Chance and includes a diversion, 6-mile flowline, and powerhouse. The Soda and Oneida developments each include a dam and reservoir impoundment.

Year round, Bear River flows are diverted at Stewart Dam, unless flood flows exceed the capacity of Rainbow Canal. Based on irrigation demands, water is released through the Bear Lake Facilities. Scheduling flow to reach the lower sections of the basin requires careful planning since it takes approximately 34 hours for Bear Lake water to reach Soda Reservoir and nearly four days to reach Cutler Reservoir. The system is operated to maintain a continuous water balance throughout the irrigation season.

Operation of the Bear Lake Facilities and the Bear River Project has not changed appreciably over its lifetime. Several factors determine the use of storage capacity and reservoir elevation. The main factors affecting operation include irrigation water rights and contractual agreements, maintenance activities, ice on the reservoirs, ice jams downstream that can cause flooding and, spring runoff from snow melt and storms.

Hydrology in the system is influenced by regulated releases from the Bear Lake Facilities to supply irrigation needs, changes in upstream storage, management of the three existing developments on the Bear River, tributary inflow, and seasonal precipitation. The river is almost completely regulated for irrigation, so it behaves differently than a natural flowing river. In years of low precipitation and runoff, irrigation demands are greater, begin earlier and last longer than during a normal year. As a result, releases from the Bear Lake Facilities are greater and power generation is higher. During years of high precipitation and runoff, flow from the Bear Lake Facilities and annual power generation can be lower, except for situations when high runoff and full storage at Bear Lake occur at the same time.

Demand for irrigation water ends in mid-October. Naturally occurring flow contributions downstream of Bear Lake are also low during this time. Flow in the river is regulated to keep reservoirs within desired operating ranges and to maintain minimum instream flows. If Bear Lake storage is too high, controlled releases are made to provide a flood storage reserve.

Flow through the Bear River Project is measured at gages maintained by PacifiCorp, including downstream of the Soda Development, Grace Dam, and the Oneida Development. Flow in the Bear River downstream of Grace Dam is the sum of discharge from the flowline, flow released from the dam, and flow contributions as the river moves through the bypass reach in Black Canyon. The location of each gage and monitoring site are shown in Figure 4.3-1. Details of the record at each location (e.g., period of record and statistical measures of flow) are included in Tables 4.3-1 through 4.3-3. Flow measurements are based on a daily average record of stage

height in feet and discharge in cubic feet per second measured continuously at 15-minute intervals.

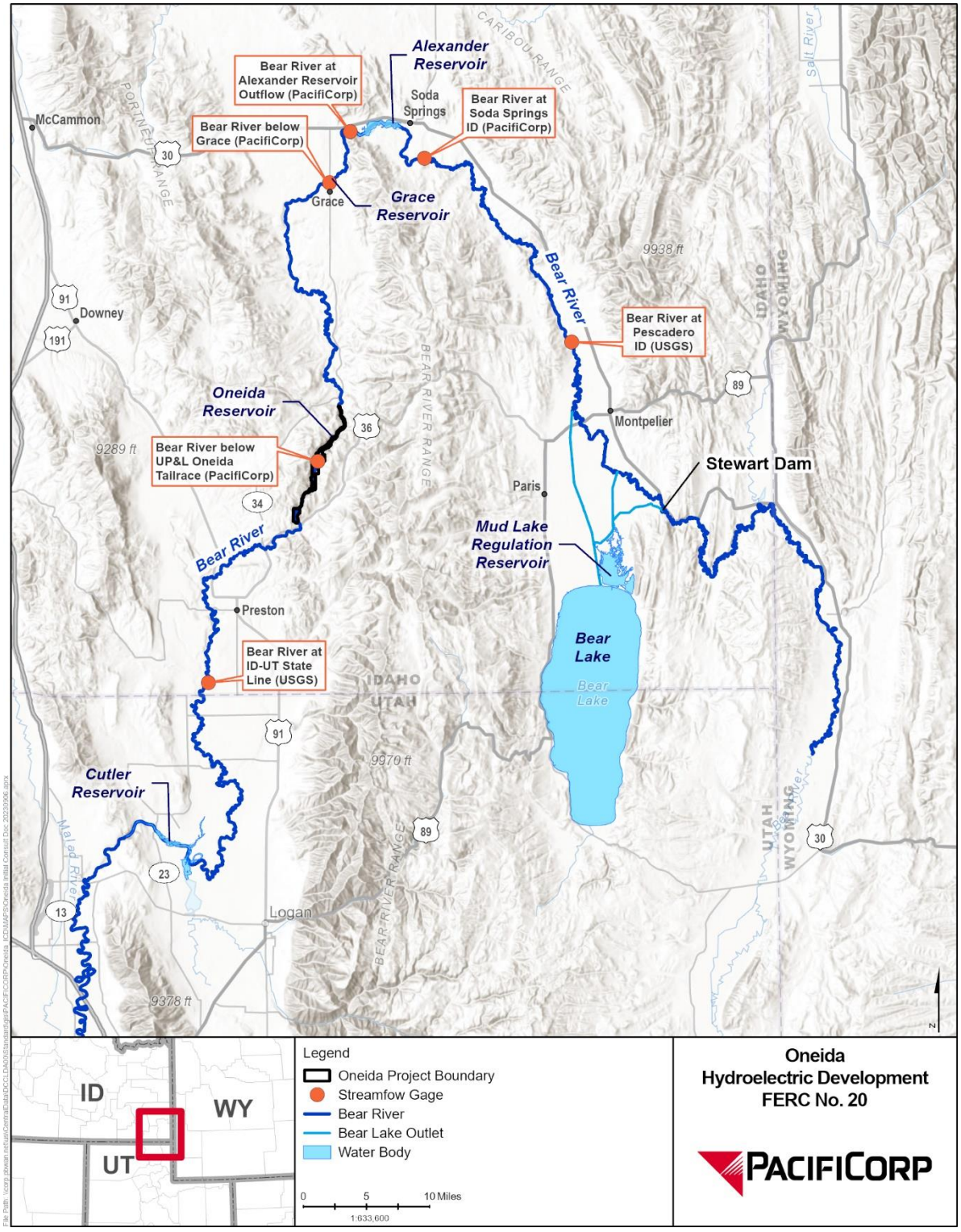


Figure 4.3-1. Stream gage locations on the Bear River upstream and downstream of the Bear River Project.

Flow data for the Soda and Grace developments are provided in Tables 4.3-1 and 4.3-2, respectively. Seasonal patterns of flow at the Soda Development are like those at the Oneida Development, with minimum flows occurring in January (324.3 cfs) and peak flows in July (1,272.2 cfs). Minimum flow at Grace Dam occurs in January (52.7 cfs) and peak flow occurs in April (146.9 cfs).

Table 4.3-1. Monthly and annual flow statistics measured from the Bear River downstream of the Soda Development.

Month/Time period	Mean (cfs)	Median (cfs)	Maximum (cfs)	Minimum (cfs)
January	324.3	207	1,401	104
February	347.4	238	1,520	104
March	524.5	376	2,409	113
April	581.4	464	1,670	37
May	679.9	613	1,700	104
June	988.8	908	1,993	252
July	1,272.2	1290	2,072	403
August	1,082.5	1082	1,820	257
September	644.5	541	1,760	97
October	381.7	212	1,660	102
November	410.4	234	1,810	131
December	357.7	207	1,620	104
Annual	634.8	464	2,409	37

Table 4.3-2. Monthly and annual flow statistics measured from the Bear River downstream of Grace Dam.

Month/Time period	Mean (cfs)	Median (cfs)	Maximum (cfs)	Minimum (cfs)
January	52.7	65	433	1
February	59.5	65	478	1
March	97.9	68	2,076	1
April	146.9	82	1,030	1
May	124.5	74	1,040	2
June	131.5	77	735	4
July	135.7	86	983	16
August	92.4	80	814	2
September	93.9	69	1,220	2
October	101.6	74	835	2
November	99.6	75	676	1
December	59.4	67	610	1
Annual	99.7	73	2,076	1

Table 4.3-3 presents monthly and annual mean, median, maximum, and minimum flows at the gage downstream of the Oneida Development based on water years 1993 through 2022. Mean monthly flows over the period of record analyzed range from 496.4 cfs in January to 1,026.7 cfs in July. Flows increase in February and peak in July in response to spring snowmelt then steadily decrease over the rest of the summer.

Table 4.3-3. Monthly and annual flow statistics measured from the Bear River downstream of the Oneida Development.

Month/Time period	Mean (cfs)	Median (cfs)	Maximum (cfs)	Minimum (cfs)
January	496.4	382	1,530	167
February	536.3	397	2,375	162
March	764.4	592	3,468	182
April	902.6	764	2,498	193
May	878.9	715	2,344	124
June	919.4	865	2,306	152
July	1,026.7	1,061	1,755	182
August	995.9	1,000	1,909	233
September	670.1	565	2,247	70
October	543.4	378	2,299	130
November	572.7	382	2,321	130
December	526.4	390	1,766	137
Annual	737.3	584	3,468	70

The annual flow duration curve at the Oneida Development is presented in Figure 4.3-2. Monthly flow duration curves show the percentage of time that specified discharges at the gage downstream of the Oneida Development were equaled or exceeded. Monthly flow duration curves are shown in Figures 4.3-3 through 4.3-6. These curves indicate that, except for spring runoff (April through July), flows are relatively consistent. However, the summary of flow records presented in Table 4.3.1-3 indicates that January is the month when flows at the development are typically lowest. Therefore, January flows would be used to estimate the Oneida Development's dependable flow capacity (see section 3.4, *Summary of Existing Project Generation, Outflow and Dependable Capacity*).

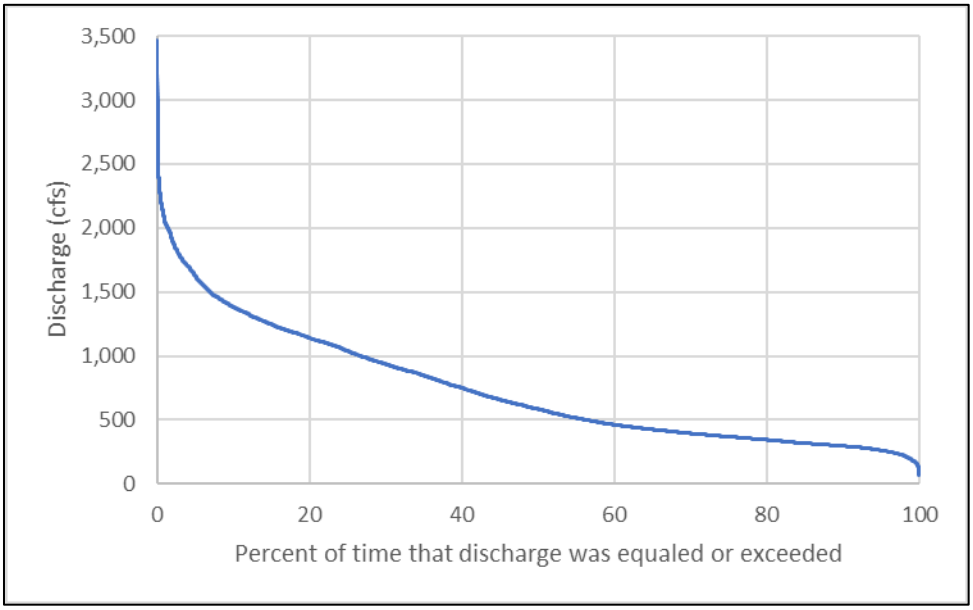


Figure 4.3-2. Annual flow duration curve based on continuous flow measurements (1993–2022) collected by PacifiCorp downstream of the Oneida Development, Idaho.

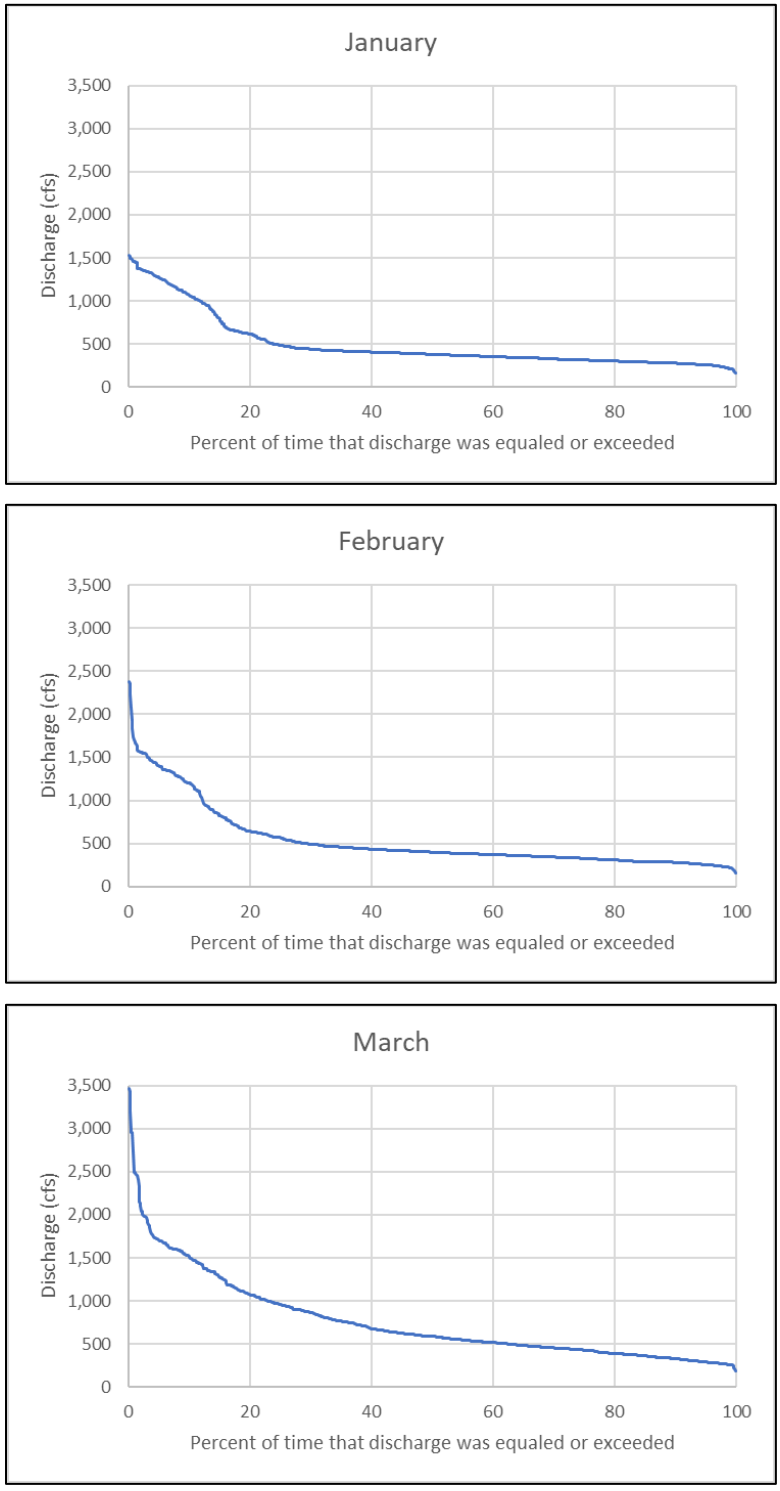


Figure 4.3-3. January, February, and March flow duration curves based on continuous flow measurements (1993–2022) measured from the Bear River downstream of the Oneida Development.

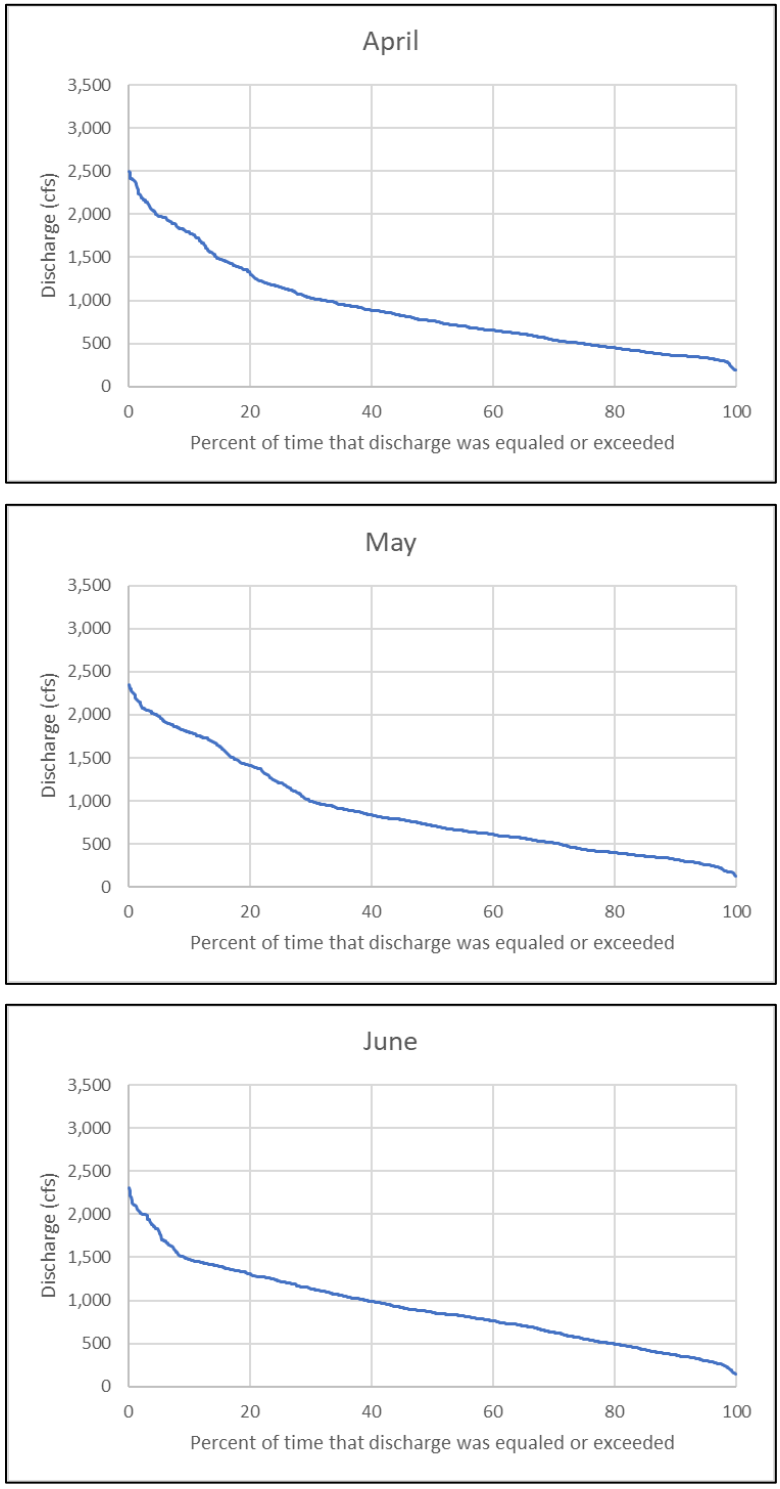


Figure 4.3-4. April, May, and June flow duration curves based on continuous flow measurements (1993–2022) measured from the Bear River downstream of the Oneida Development.

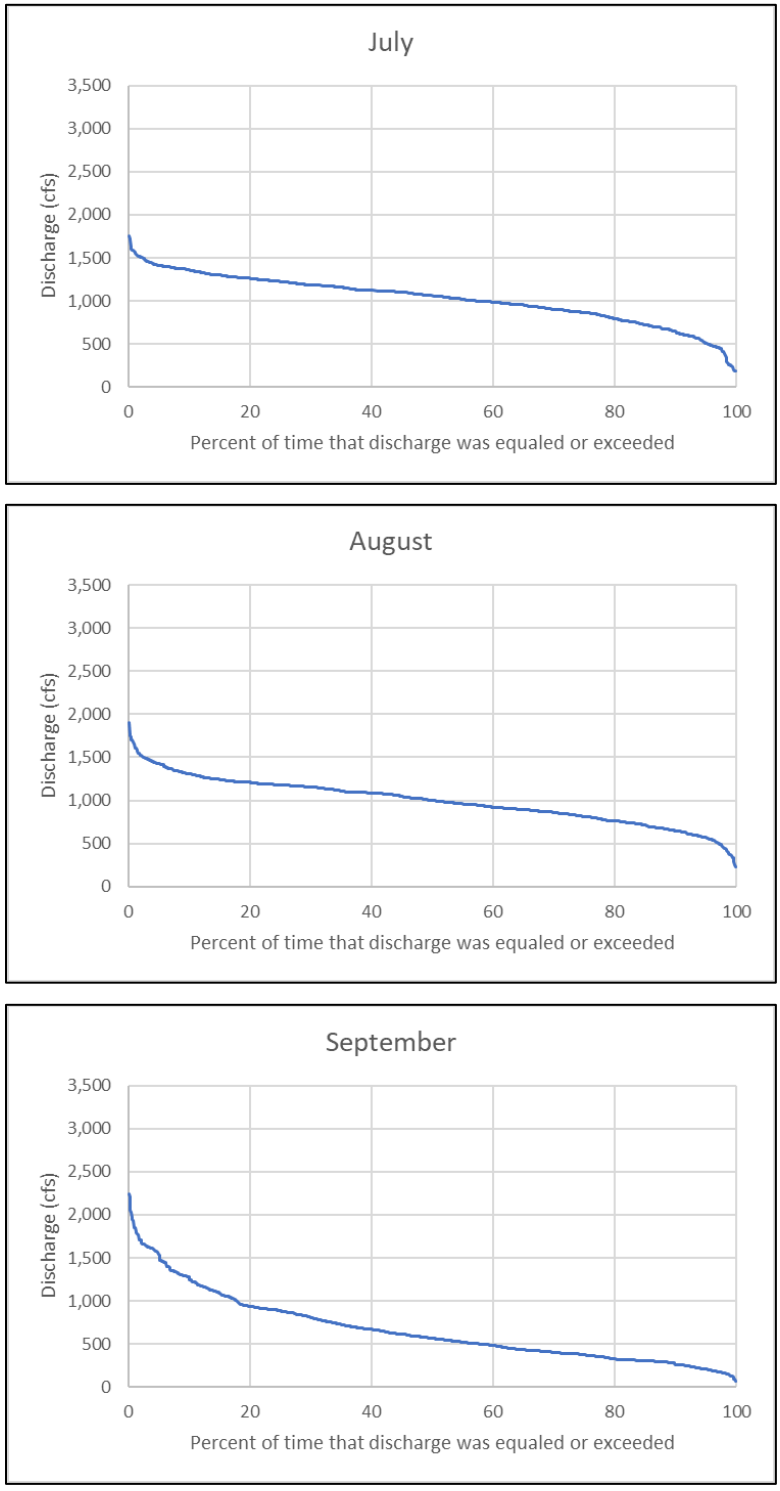


Figure 4.3-5. July, August, and September flow duration curves based on continuous flow measurements (1993–2022) measured from the Bear River downstream of the Oneida Development.

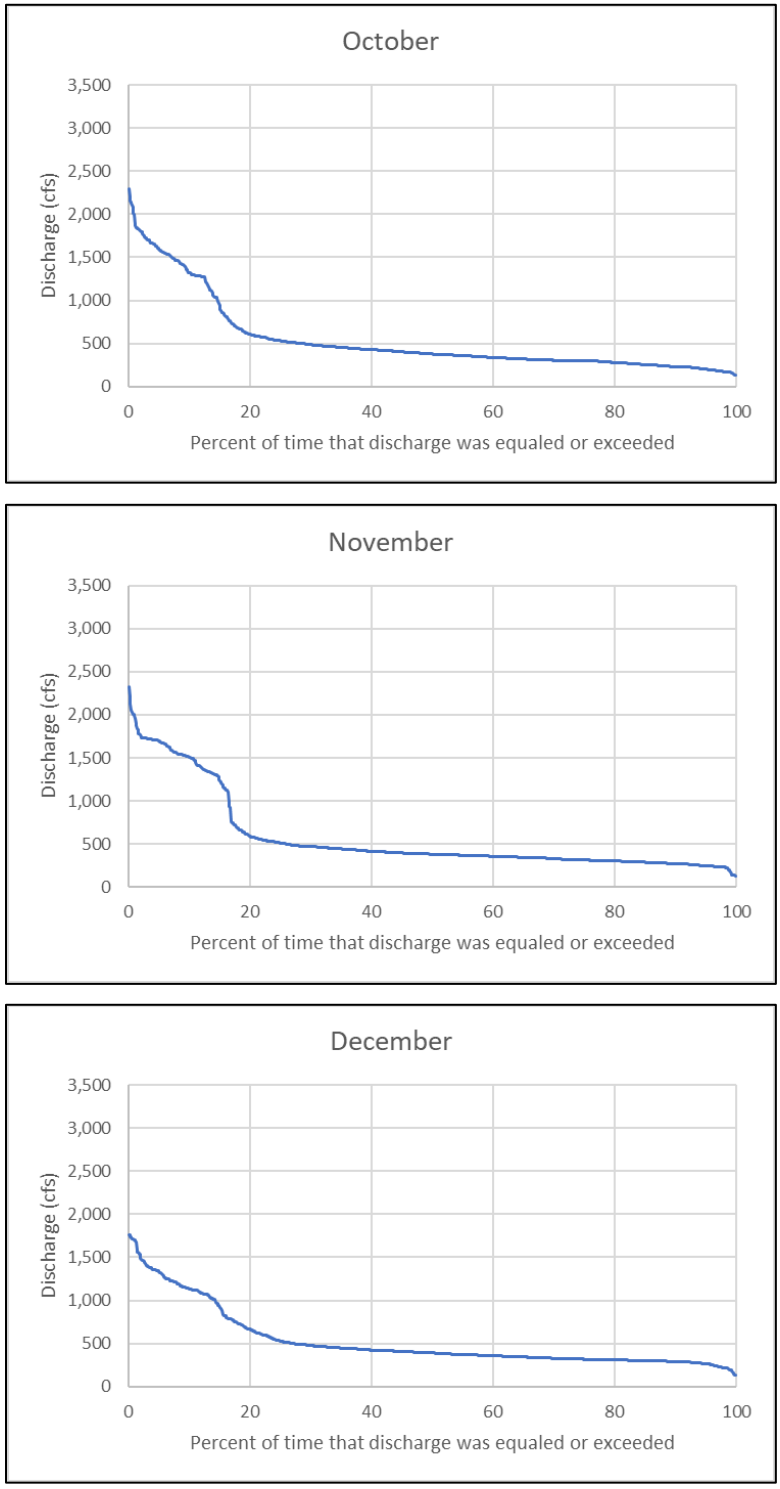


Figure 4.3-6. October, November, and December flow duration curves based on continuous flow measurements (1993–2022) measured from the Bear River downstream of the Oneida Development.

Bear River Project Reservoirs

Alexander Reservoir is located about 44 miles downstream of Bear Lake with a maximum active storage capacity of approximately 15,760 acre-feet and a normal pool elevation of 5,720 feet msl. The reservoir is owned and operated by PacifiCorp as a regulating reservoir that releases water to meet irrigation requirements first as well as power generation. Water is released through the powerhouse (maximum capacity of about 2,512 cfs), a low-level outlet from the dam (900 cfs), or through spillway gates at the dam. FERC requirements include a minimum flow in the Bear River downstream of the dam of 150 cfs or inflow if less than 150 cfs to support aquatic life. The required ramp rate at the Soda Development is 1.2 feet per hour ascending and descending.

Grace Dam is located about 5 miles downstream from the Soda Development. The dam has an elevation of 5,555 feet msl, with a diversion capacity of 960 acre-feet to the Grace Flowline. The reservoir formed by the diversion has an active storage capacity of about 250 acre-feet. The flowline is 4.9 miles long and delivers water to the powerhouse located about 6 river miles downstream of the dam.

Oneida Reservoir is a long narrow water body with a surface area of 480 acres, usable storage capacity of 10,880 acre-feet, and normal pool elevation of 4,882.4 feet msl. The reservoir has an average depth of about 28 feet and a maximum depth of about 85 feet at full pool. Water surface elevation varies about 1 to 2 feet from month to month and about 4 feet total during a typical operating year. Oneida Development is operated to maintain level control in the downstream Cutler Reservoir during the irrigation season, due to the amount of time required for Bear Lake releases to travel to the Cutler Project. During the winter season, Oneida Reservoir is held nearly full to maintain maximum head for power generation and to minimize problems with surface ice. On average, the reservoir releases about 2,000 acre-feet of water each day. The reservoir has a hydraulic retention time of about 6 days.

Bear River Project Tailwaters

The Soda Development tailwater area extends downstream from Soda Dam approximately 400 feet to the Soda Project Boundary. The tailwater area covers approximately 0.5 acres. The normal tailwater operating level downstream of Soda Dam is 5,614 feet msl and the maximum level is 5,665 feet msl.

The Grace Development tailwater area includes the tailrace area at the point of discharge from the powerhouse to the Grace Project Boundary located 350 feet downstream where the discharge mixes with Bear River flow from the bypass reach. The tailrace opening at the powerhouse is approximately 115 feet wide but narrows to about 65 feet wide for most of its length. Total area of the Grace tailwater is approximately 0.7 acres. No historical tailwater gaging is available for the Grace Development. Monitoring in April 1995 indicates normal elevations ranged 5,026.8–5,027.4 feet msl (PacifiCorp, 1998).

The Bear River downstream of Oneida Dam extends approximately 4 miles before reaching the extent of the Oneida Project Boundary. The channel width is approximately 130 feet resulting in a total tailwater area of approximately 63 acres. The river channel is confined by steep mountain slopes along most of this length. Some floodplain areas are located near Redpoint Campground, approximately 3.5 miles downstream of Oneida Dam. Regarding aquatic habitat, this channel segment is considered the best fishery on the Bear River due to good water clarity, water temperature, and suitable habitat for trout growth and survival. No historical tailwater gaging is available for the Oneida Development. Monitoring in April 1995 indicates normal elevations ranged 4,702.5 to 4,704.0 feet msl (PacifiCorp, 1998).

Proposed Oneida Pumped Storage Facility

Other than the water resources described above, there are no known water bodies or other water resources in the vicinity of the proposed Oneida Pumped Storage Facility or Oneida Project Boundary.

Water Uses

Water uses, as defined by Idaho Department of Environmental Quality (IDEQ), in the Project area include water supply for agriculture and hydropower purposes, aquatic life (cold water biota and salmonid spawning), and recreation (primary and secondary contact). A description of each water use is included below.

Agriculture

The primary use of water in the Bear River watershed is for irrigation. The irrigation season generally runs from April through October. During this time, Bear River water is used to irrigate roughly 150,000 acres of land downstream of Bear Lake. The total annual crop value to the 2,600 farmers that receive water from the Bear River is estimated at $45 million. Peak demand for irrigation water usually occurs in late July and totals about 1,800 cfs during an average water year (PacifiCorp, 1998; Utah DWR, 2023). Water rights for major irrigators below Bear Lake are included in Table 4.3-4.

Table 4.3-4. Major irrigators from the Bear River downstream of Bear Lake.

Irrigation Company	Bear Lake Irrigation Storage Contract Date	Bear Lake Irrigation Storage Contract Amount	Historic Total Annual Diversion	Point of Diversion
Bear River Canal Company	1912	900 cfs in summer and 150 cfs in winter	235,000 ac-ft	Cutler Dam
Cub River Irrigation Company	1916	20,000 ac-ft	13,000 ac-ft	Pump Station below Oneida Development
Last Chance Canal Company	1919	40,000 ac-ft	35,000 ac-ft at Last Chance Canal and 25,000 ac-ft at Bench B	Bear River above Grace Dam

Irrigation Company	Bear Lake Irrigation Storage Contract Date	Bear Lake Irrigation Storage Contract Amount	Historic Total Annual Diversion	Point of Diversion
West Cache Canal Company	1919	29,700 ac-ft	40,000 ac-ft	Bear River below Oneida Development
Bear River Small Irrigators of Idaho (includes Gentile Canal)	1989	3.0% of Annual Bear Lake Irrigation Storage Allocation (7,350 acre-feet max)	NA	Various locations in Idaho
Bear River Small Irrigators (of Utah)	1989	4.8% of Annual Bear Lake Irrigation Storage Allocation (11,760 acre-feet max)	NA	Various locations Utah

Source: PacifiCorp (2023)

Hydropower

The only substantial use of water for hydropower generation on the Bear River is solely at PacifiCorp facilities. Each facility and the amount of water right for power generation or to store for power generation in the Bear River Project area is shown in Table 4.3-5. Water removed from the Bear River for power generation is returned to the river except for the amount lost to evaporation and transpiration.

Table 4.3-5. PacifiCorp water rights associated with the Bear River Project.

Development	Source of Water Right	Date	Amount	Type	License no.	Location of Use
Soda	License 11-2081	1922	1,500 cfs	Diversion	11-2081	Soda Powerhouse
	Claim 11-4357	1922	400 cfs	Diversion	11-4357	Soda Powerhouse
	Claim 11-4359	1922	600 cfs 16,472 ac-ft	Diversion Storage	11-4359	Soda Powerhouse
Grace	Dietrich Decree	1905	500 cfs	Diversion	13-957	Grace Powerhouse
	Dietrich Decree	1908	500 cfs	Diversion	13-958	Grace Powerhouse
Oneida	Dietrich Decree	1910	1000 cfs	Diversion	13-967	Oneida Powerhouse
	Dietrich Decree	1911	1,500 cfs	Diversion	13-968	Oneida Powerhouse
	Claim 13-4129	1910	700 cfs 11,485 ac-ft	Diversion Storage	13-4129	Oneida Powerhouse

Aquatic Life

Beneficial uses for aquatic life in the Bear River include Cold Water Biota and Salmonid Spawning. Water for Cold Water Biota has optimal growing temperatures below 18 degrees Celsius. Water for Salmonid Spawning is characterized by flowing water and not still waters in reservoirs. Based on IDEQ definition (PacifiCorp, 1998; IDEQ, 2016; IDFG, 2019), salmonid fish in the Bear River near the Project and their spawning and incubation periods include: brown trout (October 1–April 1), cutthroat trout (April 1–August 1), rainbow trout (January 15–July 15), and mountain whitefish (October 15–March 15). A detailed discussion of cold-water biota and salmonid fish in the Project is included in section 4.4, *Fish and Aquatic Resources*.

Recreation

In addition to fishing, recreational use of the Bear River and reservoirs is steadily increasing. Primary Contact Recreation is assigned to water that is suitable for prolonged and intimate contact by humans when ingestion of small quantities of water is likely to occur, such as during swimming. Secondary Contact Recreation is assigned to waters for recreational use such as fishing, boating, wading and other activities where ingestion of raw water is not probable. (IDEQ, 2016).

4.3.2 Projected Future Uses of Bear River Project Waters

According to Idaho Water Resource Board (2012), Idaho's power demand is expected to increase substantially over the next several decades as the population of the state continues to grow. Although most cost effective and flexible sites have been developed, there will be opportunities to increase hydroelectric generating capacity while preserving environmental protection. These include enhancing incremental capacity at existing sites through new technologies that yield greater energy efficiency, adding generation capacity at existing dams, and developing generation capacity in conjunction with the construction of new projects (e.g., pumped storage). It is reasonable to expect that, as the population continues to grow, technologies develop, and demand for renewable energy production increases, the development of new projects will be explored.

4.3.3 Water Quality

Surface Water Quality Standards

Oneida Reservoir is in the Middle Bear River subbasin (HUC 16010202). Oneida Dam bisects two IDEQ water body assessment units in the subbasin. The upstream unit (16010202BR009) includes waters from Oneida Reservoir to Alexander Reservoir and includes all the hydropower developments in the Bear River Project. The tailwater of the Oneida Development is within the downstream assessment unit (16010202BR006). *Idaho Surface Water Quality Standards* (IDEQ, 2022), water quality criteria vary by the designated beneficial use classification. criteria vary by the designated beneficial use classification.

The upper and lower water body assessment units are classified as high-quality waters. The middle Bear River is designated "COLD/SS" for aquatic life, meaning it is a cold body of water supporting salmonid (i.e., trout) spawning. The middle Bear River has also been designated

"PWR" for recreation, meaning primary contact recreation such as swimming where small amounts of water may be ingested, and "IW and AW," industrial and agricultural water supply. As the aquatic life designation is most relevant and conservative in terms of the constituents potentially affected by the proposed Oneida Pumped Storage Facility, it provides the best reference for this review. Water quality criteria for the COLD/SS designation are listed in Table 4.3-6.

Past assessments of water quality in the middle Bear River, discussed below, have identified flow modifications, total suspended solids (TSS), total phosphorus (TP), and temperature as the primary parameters of concern.

Table 4.3-6. Surface water quality criteria for COLD/SS aquatic life use designation.

Parameter	Standard Section	Beneficial Use COLD/SS
pH	Section 250.01(a)	pH values within the range of 6.5 to 9.0.
Total Gas Pressure	Section 250.01(b)	Not to exceed 110% of saturation at atmospheric pressure at the point of sample collection.
Dissolved Oxygen	Section 250.02(a)	Greater than 6 mg/L (instantaneous standard) at all times. In lakes and reservoirs this standard does not apply to the bottom 20% of water depth in natural lakes and reservoirs where depths are 35 meters or less.
	Section 250.02(f)(i)(2)(a)	One-day minimum of not less than 6 mg/L or 90% of saturation, whichever is greater.
Temperature	Section 250.02(b)	Water temperatures of 22°C (acute standard) or less with a maximum daily average of no greater than 19°C (chronic standard).
	Section 250.02(f)(ii)	Water temperatures of 13°C (acute standard) or less with a maximum daily average no greater than 9°C (chronic standard).
Ammonia	Section 250.02(d)	Criteria are dependent upon the temperature and pH of the water body–see regulation.
Turbidity	Section 250.02(e)	Shall not exceed background below any applicable mixing zone set by the Department by more than 50 NTU instantaneously or more than 25 NTU for more than 10 consecutive days.

Source: IDEQ (2021)

The federal Clean Water Act (CWA) requires states to maintain or restore the integrity of waters of the U.S. Section 303(d) of the CWA requires states to identify waters failing to meet water quality standards and report them to the Environmental Protection Agency (EPA). Under Section 305(d), states are required to publish a priority list of impaired waters on a biennial basis. From this priority list, states then develop Total Maximum Daily Loads (TMDL).

IDEQ began collecting data for the Middle Bear River subbasin in 1998 because of 39 segments of the Bear River being listed as impaired. Based on this information, IDEQ concluded that TP and TSS were impairing water quality in the mainstem of the Bear River. A TDML was later completed and approved in 2006.

In 2011, an addendum to the 2006 TMDL was produced for the Bear River subbasins. Assessments for TP indicate the Bear River in the middle Bear River subbasin does not meet the mean target of 0.075 mg/L, but the median TP is met. Targets are met downstream of the Alexander and Oneida reservoirs at monitoring locations, indicating that both PacifiCorp reservoirs are sinks for TSS and TP.

Temperature for salmonid spawning was added to the list of impaired parameters for the middle Bear River in 2010 during the reassessment of the system. Temperature is listed as a Category 5 parameter, meaning it has not been assessed.

Existing Water Quality

Oneida Reservoir

Water quality data for Oneida Reservoir are temporally limited. Physical and chemical data were collected from May to November in 2009 by Utah State Water Research Lab at four locations. At each location, water temperature, DO, and turbidity were collected at 1-meter intervals throughout the water column, using a multi-parameter sonde. Sediment and nutrient data were collected at a wider range of depths (Stevens and Milleson, 2012).

Temperature

Seasonal patterns in 2009 are similar between the four sites, with warmer temperatures prevalent during the summer and cooling in the fall. Mean, minimum, and maximum temperatures were similar across all sites with mean temperature being slightly cooler at OR4 (Oneida Dam; Table 4.3-7). Mean temperatures ranged from 12.8°C to 15.6°C. Maximum temperatures exceeded 24°C across all sites.

A thermocline was observed in Oneida Reservoir during the summer monitoring period and developed in deeper waters near the dam measured at sites OR4 and OR3, located close to Maple Grove campground. The thermocline developed in June at a depth of 14 meters, and by November the reservoir had turned over and the column was entirely mixed Figure 4.3-8.

Dissolved Oxygen

DO measurements were collected at the same time and locations monitored for temperature. A comparison between sites indicated that mean DO concentrations were generally lower near the dam, however median concentrations were similar across sites (Table 4.3-7). DO is low to near zero when Oneida Reservoir is stratified in the hypolimnion, as shown in the June profile in Figure 4.3-8. This characteristic is common in deeper reservoirs.

Turbidity

Turbidity measurements were taken with depth and at all four sites. Turbidity tends to be higher closer to the inflows of the Bear River and lower near the dam as would be expected when sediments drop from the water column. Mean turbidity ranged from 26.1 NTU at site OR1 to 4.3 NTU at site OR4 (Table 4.3-7).

Total Phosphorus

Total phosphorus samples were collected at four sites across a range of depths. Mean concentrations of TP ranged from 0.07–0.12 mg/L across all sites (Table 4.3-7). Median concentrations ranged from 0.05–0.09 mg/L. The maximum concentration recorded was 1.2 mg/L at site OR4, however this could be a typo in the available data when compared to recorded concentrations of TP in the Bear River upstream of the Oneida Development.

Total Suspended Solids

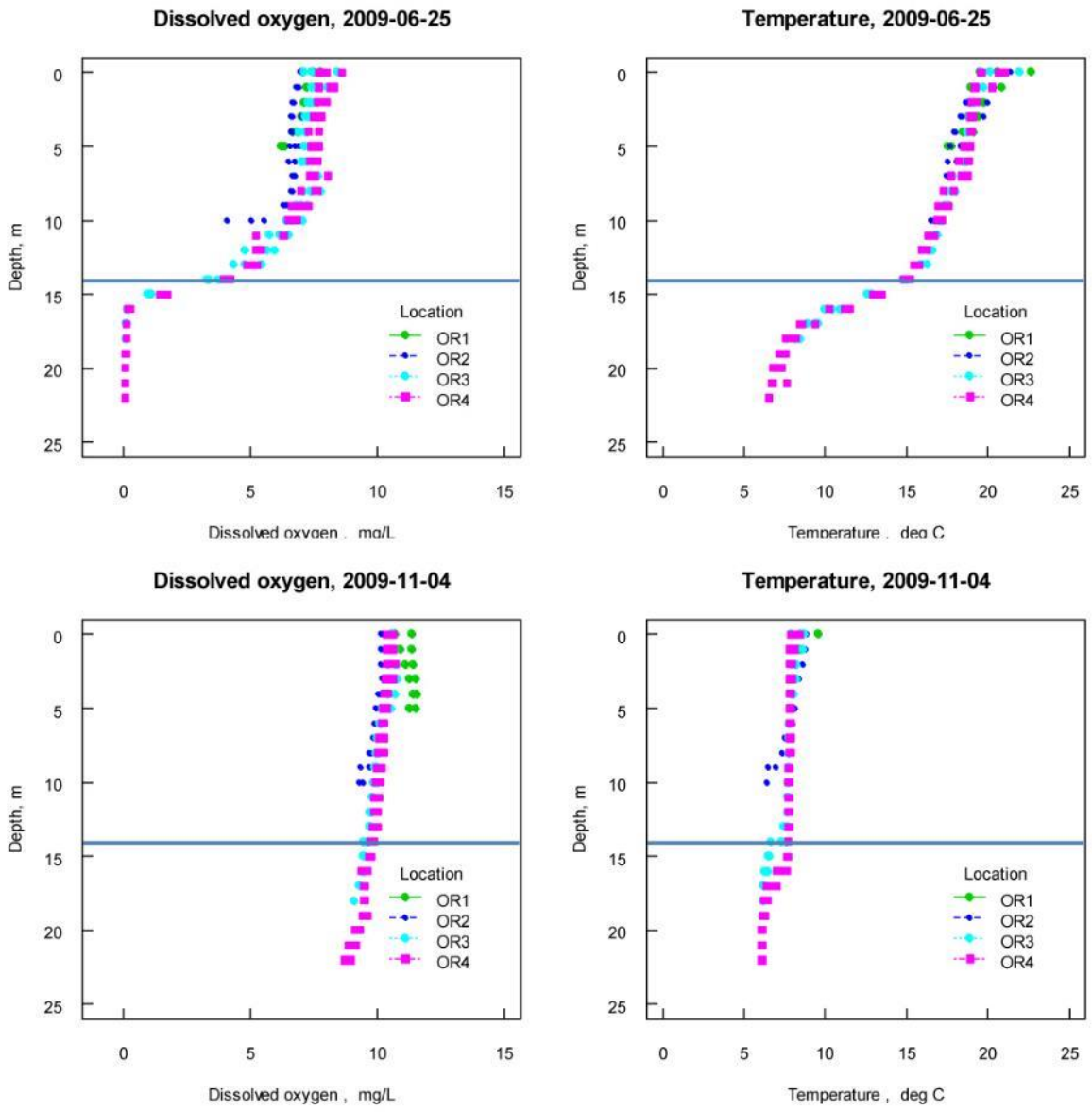
Samples of TSS were collected at the four Oneida Reservoir sites through the collection period in 2009. The upper most site (OR1) had higher concentrations of TSS than what was measured at site OR4 near the dam. Maximum concentrations ranged from 73.6 mg/L at OR3 to 28.4 mg/L at OR1 (Table 4.3.3-2). Mean concentrations ranged from 26.2 mg/L (OR1) to 6.5 mg/L (OR4). Sediment is captured in Oneida Reservoir when velocities drop, as would be expected.

Table 4.3-7. Water quality data collected at four locations in Oneida Reservoir.

Site/Parameter	Min	Median	Mean	Max
Site OR1				
Dissolved Oxygen (mg/L)	6.19	7.69	8.48	12.60
Temperature (°C)	0.43	17.53	15.63	24.60
pH	7.07	7.61	7.61	8.01
Specific Conductance (umho/cm)	514.50	785.05	733.17	882.00
Turbidity (NTU)	0.00	20.25	26.07	116.60
Total Phosphorus (mg/L)	0.02	0.09	0.09	0.21
Total Nitrogen (mg/L)	0.28	0.96	1.05	1.65
Suspended Solids (mg/L)	2.40	26.15	26.21	73.40

Site/Parameter	Min	Median	Mean	Max
Site OR2				
Dissolved Oxygen (mg/L)	2.58	7.76	8.10	12.20
Temperature (°C)	0.41	17.46	15.60	24.17
pH	7.01	7.68	7.67	8.06
Specific Conductance (umho/cm)	520.10	794.60	733.32	877.20
Turbidity (NTU)	0.00	7.65	14.25	150.00
Total Phosphorus (mg/L)	0.02	0.05	0.07	0.24
Total Nitrogen (mg/L)	0.38	0.97	1.02	1.66
Suspended Solids (mg/L)	2.00	11.95	16.41	73.60
Site OR3				
Dissolved Oxygen (mg/L)	0.07	7.72	7.33	13.70
Temperature (°C)	0.39	16.45	14.46	24.13
pH	6.86	7.72	7.66	8.23
Specific Conductance (umho/cm)	525.90	792.50	738.41	913.70
Turbidity (NTU)	0.00	4.00	7.65	348.00
Total Phosphorus (mg/L)	0.02	0.05	0.07	0.37
Total Nitrogen (mg/L)	0.45	0.92	0.97	1.72
Suspended Solids (mg/L)	1.80	6.80	8.65	37.90
Site OR4				
Dissolved Oxygen (mg/L)	0.05	7.60	6.59	13.80
Temperature (°C)	0.42	12.52	12.84	24.33
pH	6.78	7.66	7.61	8.34
Specific Conductance (umho/cm)	536.10	791.10	750.27	917.50
Turbidity (NTU)	0.00	2.15	4.35	51.70
Total Phosphorus (mg/L)	0.02	0.07	0.12	1.50
Total Nitrogen (mg/L)	0.36	0.94	1.05	2.30
Suspended Solids (mg/L)	1.00	5.20	6.53	28.50

Source: Stevens and Milleson (2012)

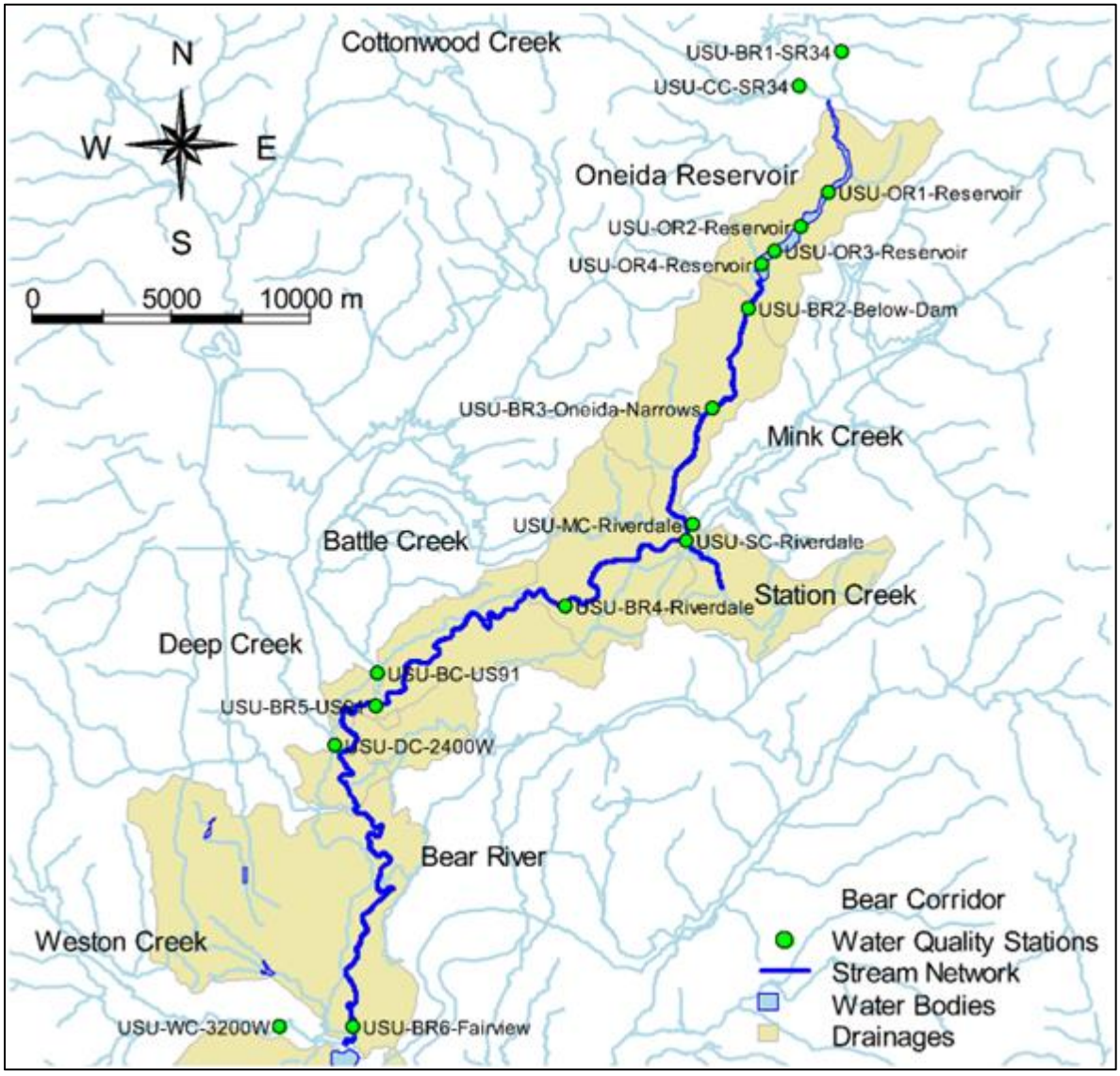


Source: Stevens and Milleson (2012)

Figure 4.3-8. Temperature and DO profiles in Oneida Reservoir.

Bear River

Water temperature and DO, along with other physical and chemical parameters, were monitored quarterly in the Bear River upstream and downstream of Oneida Reservoir 2006–2018 by IDEQ (IDEQ, 2019). Utah State University (USU) collected physical and chemical data upstream and downstream of Oneida Reservoir monthly in 2009. These monitoring sites are shown in Figure 4.3-7.



Source: Stevens and Milleson (2012)

Figure 4.3-7. Locations of water quality monitoring stations established by Utah State University along the Bear River and its tributaries upstream and downstream of Oneida Reservoir.

Temperature

Seasonal temperatures in the Bear River upstream and downstream of Oneida Reservoir follow similar trends with cooler winter temperatures and warm summer temperatures. The hottest temperatures typically occur in July and early August, then begin to cool. Peak temperatures in the Bear River upstream of Oneida can exceed LT50 (temperature to kill 50 percent of organisms) for Bonneville cutthroat trout of 24.2°C (Cirrus, 2019). Data collected by IDEQ from 2006–2018 show maximum temperature at the Highway 34 bridge (Site BR15) of 22.3°C, which is stressful to sublethal for Bonneville cutthroat trout (Table 4.3-8). The maximum temperature recorded in 2019 by USU was 19.9°C, which falls within the annual temperature variability for

the Bear River. Mean recorded temperature upstream of Oneida Reservoir is 11.9°C, with a minimum temperature of 1.3°C or near freezing during the winter months.

Downstream of Oneida Reservoir (BR16) temperatures follow a similar seasonal pattern, with the maximum temperature recorded by IDEQ of 22.1°C (Table 4.3-8). Similar temperatures were observed at BR2, collected by USU in 2009, with a maximum temperature of 21.9°C. Mean temperature downstream of Oneida Reservoir for the period of 2006–2018 is 12.9°C. These higher recorded mean temperatures are likely a result of the thermal regulation and mass within Oneida Reservoir.

IDEQ views salmonid spawning as a subcategory of Cold-Water Aquatic Life and sets chronic temperature standards for all self-propagating salmonid fish in Idaho. Numeric temperature standards for spawning address specific temperature criteria for egg incubation. As indicated above in Table 4.3-6, the chronic temperature standards for Bear River are an average of 9°C during the salmonid spawning period and an average of 19°C for the remainder of the year. The spawning period typically occurs in late spring, and emergence of fry occurs early to mid-summer. The 9°C standard is typically exceeded from mid-April through spawning period in the mainstem of the Bear River.

The 19°C chronic standard for the non-spawning period is often exceeded in late June through mid-August, then temperatures gradually decline. Continuous data collected in 2018 in the Bear River upstream of Oneida Reservoir to the former Cove Project site show the Bear River exceeds temperature standards in late June through mid-August (Cirrus, 2019) (Figure 4.3-9).

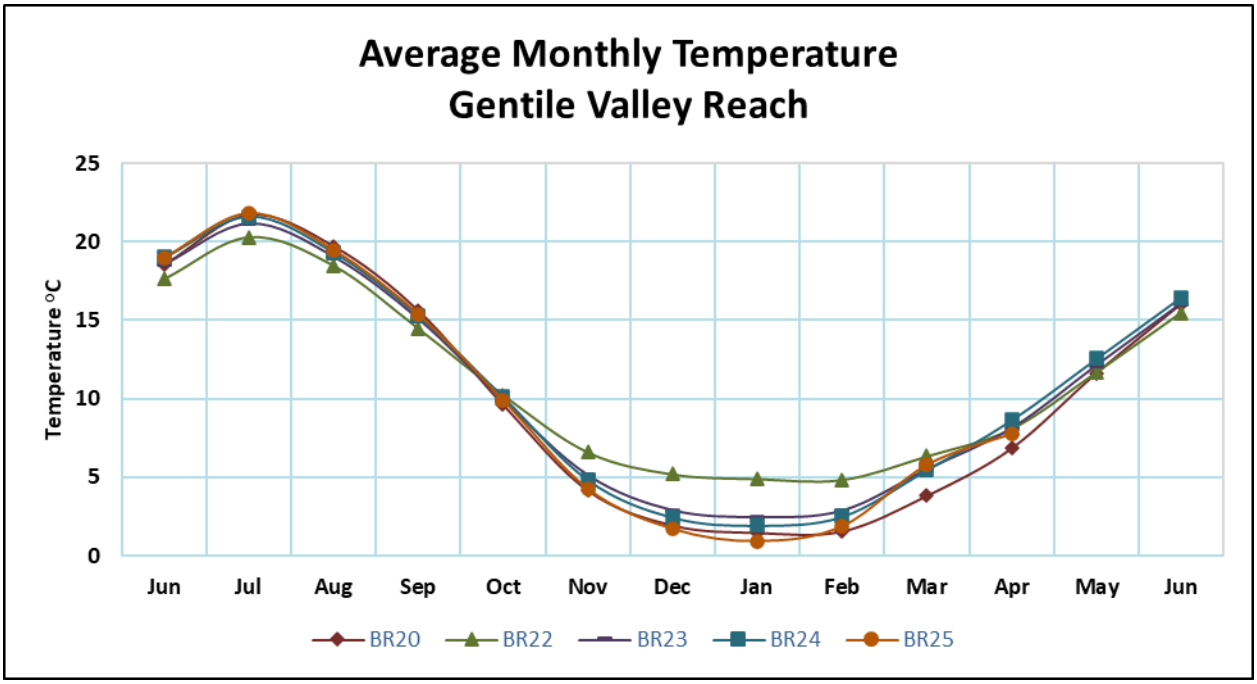


Figure 4.3-9. Average monthly temperatures measured in the Bear River upstream of Oneida Reservoir.

Dissolved Oxygen

Minimum DO levels recorded by IDEQ from 2006 through 2018 upstream and downstream of Oneida Reservoir did not exceed the state standard of 6.0 mg/L (Table 4.3-8). In data collected monthly in 2009 by USU, levels were all above the state standard.

Mean DO levels upstream at the Highway 34 bridge, sites BR15 and BR1, were 9.6 mg/L and 9.9 mg/L. Minimum DO levels were 6.1 mg/L and 7.0 mg/L, and maximum DO levels were 13.3 mg/L and 13.2 mg/L, respectively (Table 4.3-8).

In the Bear River downstream of Oneida Dam at sites BR16 and BR2, mean DO levels were 9.5 mg/L and 9.7 mg/L, minimum levels were 6.1 mg/L and 7.0 mg/L, and maximum DO levels were 12.6 mg/L and 11.8 mg/L, respectively.

TSS and Turbidity

TSS and turbidity generally increase in the Bear River upstream of Oneida Reservoir concurrent with lower basin runoff, continue through peak runoff, and gradually decline though the summer as flows are reduced near the end of the irrigation season in mid-October. During winter baseline conditions with reduced flows, TSS and turbidity are generally low. High flows are typically related and result in bank sloughing and internal bedload and movement resulting in the increased suspension of material.

Downstream of Oneida Dam, TSS and turbidity are substantially reduced as a result of the reservoir acting as a sink for sediment in the Bear River system. Sediment typically follows a similar season trend with high loads in the spring and summer and low loads during winter baseflow conditions.

Mean TSS levels upstream at the Highway 34 bridge, sites BR15 and BR1, were 29.7 mg/L and 24.6 mg/L. Minimum TSS levels were 5.0 mg/L and 2.4 mg/L, and maximum TSS levels were 295.0 mg/L and 97.0 mg/L, respectively (Table 4.3-8).

In the Bear River downstream of Oneida Dam at sites BR16 and BR2, mean TSS levels were 6.1 mg/L and 5.8 mg/L, minimum TSS levels were 5.0 mg/L and 2.0 mg/L, and maximum TSS levels were 22.0 mg/L and 10.7 mg/L, respectively.

Turbidity or optical clarity of the water column is highly variable seasonally at monitoring sites on the Bear River upstream and downstream of Oneida Reservoir. Turbidity 2006–2018 measured by IDEQ upstream of Oneida Reservoir shows a range of 0.0 NTU to 88.9 NTU, while downstream measurements range from 1.1 NTU to 19.2 NTU.

Total Phosphorus

The Idaho State Standard for TP in the Bear River is 0.075 mg/l. Some Bear River water quality samples do not meet this standard upstream or downstream of Oneida Reservoir. TP concentrations are seasonally variable and likely associated with TSS. The highest concentration of TP typically occurs in the spring during runoff. Data collected by IDEQ from 2006-2018 show a mean concentration of TP at BR15 upstream of Oneida Reservoir of 0.07 mg/L, while downstream of Oneida Dam mean concentrations are 0.04 mg/l. Concentrations of TP range 0.01–0.33 mg/l at BR15, and downstream of Oneida Dam range 0.01–0.11 mg/l.

Table 4.3-8. Water quality data collected by IDEQ and USU upstream and downstream of Oneida Reservoir.

USU 2009 (Site/Parameter)	Min	Median	Mean	Max	IDEQ 2006 -2018 (Site/Parameter)	Min	Median	Mean	Max
Site: BR1					**Site BR15**				
Dissolved Oxygen (mg/L)	7.04	10.23	9.93	13.27	Dissolved Oxygen (mg/L)	6.11	9.56	9.69	13.31
Temperature (°C)	0.31	8.52	9.87	19.92	Temperature (°C)	1.38	12.39	11.96	22.32
pH	6.70	8.09	8.02	8.78	pH	7.56	8.11	8.08	8.42
Specific Conductance (umho/cm)	520.10	732.70	709.70	812.00	Specific Conductance (umho/cm)	0.48	0.71	0.69	0.80
Turbidity (NTU)	0.00	23.90	30.20	146.00	Turbidity (NTU)	0.80	18.33	18.38	88.97
Total Phosphorus (mg/L)	0.02	0.07	0.07	0.16	Total Phosphorus (mg/L)	0.01	0.07	0.07	0.33
Total Nitrogen (mg/L)	0.60	1.04	1.15	2.54	Total Nitrogen (mg/L)	0.42	1.01	1.03	1.85
Suspended Solids (mg/L)	2.40	22.70	24.60	97.10	Suspended Solids (mg/L)	5.00	25.00	29.76	295.00
Site: BR2					**Site: BR16**				
Dissolved Oxygen (mg/L)	7.00	9.84	9.72	11.83	Dissolved Oxygen (mg/L)	6.12	9.56	9.53	12.68
Temperature (°C)	2.00	7.99	10.08	21.91	Temperature (°C)	4.25	12.07	12.90	22.17
pH	7.22	7.74	7.70	8.22	pH	7.43	7.82	7.82	8.23
Specific Conductance (umho/cm)	539.20	800.20	763.00	902.60	Specific Conductance (umho/cm)	0.49	0.75	0.72	0.88
Turbidity (NTU)	0.00	8.20	8.90	25.70	Turbidity (NTU)	1.17	3.60	5.58	19.20
Total Phosphorus (mg/L)	0.03	0.06	0.06	0.10	Total Phosphorus (mg/L)	0.014	0.04	0.04	0.11
Total Nitrogen (mg/L)	0.62	1.01	1.06	1.70	Total Nitrogen (mg/L)	0.23	0.84	0.88	1.75
Suspended Solids (mg/L)	2.20	5.10	5.80	10.70	Suspended Solids (mg/L)	5	5.00	6.10	22.00

Source: IDEQ (2019); Stevens and Milleson (2012)

Operation Effects on Water Quality

Water quality is degraded in the Bear River watershed. The Oneida Development is licensed to operate in a modified run-of-river mode, passing all inflows and maintaining a stable water surface elevation. High inflows relative to the limited reservoir volume reduce water retention time. Temperatures in Oneida Reservoir are typically uniform across the surface and similar to temperatures measured in upstream and downstream Bear River segments.

A thermocline develops in the reservoir during the hottest periods of the year, as noted above (section 4.3.2.2). Warmer temperatures at depth during the summer result in warmer waters exiting Oneida Reservoir as shown by higher mean temperatures during that time. The Oneida Reservoir acts as a sink for TSS and TP and improved conditions in the Bear River downstream of Oneida Dam. Oneida Development operations appear to have little impact on water quality.

4.3.4 Existing Protection, Mitigation, and Enhancement Measures

The primary measures in place to protect, mitigate and enhance water quality in the Bear River system, including the Oneida Development, are Idaho's surface water quality standards and the 2006 TMDL providing a platform for efforts to achieve them in non-attainment areas.

4.4 FISH AND AQUATIC RESOURCES

The Bear River supports a diverse fish community in which many of the dominant species are non-native fishes. PacifiCorp's Bear River Project license has enhancement measures to promote Bonneville cutthroat trout populations through stream restoration, connectivity to tributaries, and augmentation by rearing and stocking. Sections of the Bear River downstream of Oneida Dam are managed as a sport fishery by stocking non-native rainbow trout. Oneida Reservoir is also managed as a sport fishery by stocking warm-water sport fishes such as walleye.

Prior to the development of the Bear River, there likely was greater connectivity among the habitats available to coldwater salmonids in the Bear River drainage. Although low stream flows may have limited the suitability of some mainstem habitats during the summer and fall, there were few, if any, barriers that impeded the migration of fish between mainstem and tributary habitats. Greater woody riparian areas also provided cooler water temperatures than occur today. It is also likely that silt-free gravel substrates, important for trout spawning and for insect production, were more common before gravel transport was interrupted by the construction of numerous dams, and the river's sediment load was increased by development of the watershed for livestock production and irrigated agriculture.

4.4.1 Aquatic Habitat

Oneida Reservoir

Oneida Reservoir is approximately 4.8 miles long, with widths ranging from 0.05 to 0.25 mile. The maximum depth of the reservoir of approximately 85 feet with an average depth of 28 feet (PacifiCorp, 1999). The reservoir is widest and deepest near the dam. A distinct channel or thalweg is developed in the upper area of the reservoir as a result of sedimentation.

Oneida Reservoir at the upper portion is generally shallow, with large deposits of sediments forming large bars along the thalweg. Gradually fanning out and deepening closer to dam. The edge of Oneida Reservoir is dominated by two habitat types including talus slope with large boulders, and mud flats. Talus and boulder habitat make up about 35 percent of the habitat along the littoral zone of the reservoir (PacifiCorp, 1999).

Oneida Dam Tailwater

Primary outflows from the reservoir discharge to the east side (river left) of the Bear River at a 90-degree angle to the historic channel. The pool at the base of the powerhouse is deep but rapidly decreases in depth as it enters the river channel. The river then broadens into a riffle with laminar flow over cobble substrate. Several islands and gravel bars are interspersed within the first 2 miles downstream of the dam before entering narrower and steeper sections of the river channel. The morphology of the Bear River downstream of the Oneida Development is a combination of complex riffles, glides, and pools. In terms of substrate, fish habitat in the river can be characterized as cobble and gravel with areas of boulder and bedrock, providing a variety of structural habitats.

4.4.2 Fish Community

Species found in Oneida Reservoir and the Bear River are identified in Table 4.4-1. Twenty-four species were collected by Utah State University in 2008-09, of which nine species were native and 15 species were introduced. PacifiCorp studies conducted in 1997 as part of Bear River Project relicensing identified 23 species, including 13 introduced species and 10 species that were native to the Bear River. The dominant fish species in Oneida Reservoir are walleye, carp, smallmouth bass, and perch comprising 86 percent of fish species, and 93 percent of the biomass (Harding et al., 2012). Dominant species found downstream of Oneida Dam include Utah sucker, rainbow trout, smallmouth bass, and mountain whitefish comprising 86 percent of fish species (Harding et al., 2012).

Table 4.4-1. Fish species composition in Oneida Reservoir and the Bear River downstream of Oneida Dam.

Common Name	Scientific Name	Status
Bonneville cutthroat trout	*Oncorhynchus clarkii*	Native
Rainbow trout	*Oncorhynchus mykiss*	Introduced
Brook trout	*Salmo trutta*	Introduced
Brown trout	*Salvelinus fontinalis*	Introduced
Mountain whitefish	*Prosopium williamsoni*	Native
Speckled dace	*Rhinichthys osculus*	Native
Mottled sculpin	*Cottus bairdii*	Native
Yellow perch	*Perca flavescens*	Introduced
Walleye	*Sander vitreum*	Introduced

Common Name	Scientific Name	Status
Catostomidae Utah sucker	*Catostomus ardens*	Native
Common carp	*Cyprinus carpio*	Introduced
Spottail shiner	*Notropis hudsonius*	Introduced
Redside shiner	*Richardsonius balteatus*	Native
Utah chub	*Gila atraria*	Native
Utah sucker	*Catostomus ardens*	Native
Bluehead sucker	*Catostomus discobolus*	Native
Bluegill	*Lepomis macrochirus*	Introduced
Green sunfish	*Lepomis cyanellus*	Introduced
Smallmouth bass	*Micropterus dolomieu*	Introduced
Largemouth bass	*Micropterus salmoides*	Introduced
Black crappie	*Pomoxis nigromaculatus*	Introduced
Black bullhead	*Ameiurus melas*	Introduced
Channel catfish	*Ictalurus punctatus*	Introduced
Cichlidae tilapia	*Oreochromis sp.*	Introduced

Oneida Reservoir

Fourteen fish studies were conducted in Oneida Reservoir from 1973 through 2009 (Figure 4.4-1). The most recent survey was completed by USU in 2008–09. Of the 15 species documented in the reservoir 10 species are introduced and five are native fishes. Four of the five native species were last documented in 1987 and include Bonneville cutthroat trout, mountain whitefish, redside shiner, and Utah chub.

Walleye is a non-native warm-water sportfish found in Oneida Reservoir. The Idaho Department of Fish and Game (IDFG) began stocking walleye in 1976 (IDFG, 2022). Walleye has been stocked in Oneida Reservoir more than 35 times; the most recent stocking occurred in 2023 (Table 4.4-2). The largest number stocked is over three million fish, and to date over 20,780,000 walleyes have been stocked into the reservoir.

Walleye spawn in shallow areas of streams with clean gravelly to cobble substrate with good oxygenation. In lakes, areas along the littoral zone are used for spawning in gravel and cobble substrate in water depths of 10 feet where good wave action occurs (PacifiCorp, 1999).

In 2009 walleye were the most abundant species in Oneida Reservoir, comprising 35 percent of the 1,444 fish collected during the USU 2008-09 study (Figure 4.4-2). Mean length and weight of walleye captured during the survey was 12 inches and 0.6 lbs with the largest walleye captured being 6.7 lbs (Figure 4.4-3) (Harding et al., 2012).

Smallmouth bass were first documented in Oneida Reservoir in 2001. In 2009, smallmouth bass were the second most abundant warm-water sportfish surveyed by USU in the reservoir (Harding et al., 2012). Smallmouth bass were introduced into the Bear River system in 1990–91 through stocking upstream and downstream of Alexander Reservoir on the Bear River. Smallmouth bass are now established in the Bear River downstream to the Idaho-Utah border (IDFG, 2022). More anglers catch smallmouth bass than walleye in Oneida Reservoir (IDFG, 2022).

In the 2009 survey, smallmouth bass abundance was 12.1 percent of the species collected. Mean average length and weight was 8.4 inches and 0.4 lbs, with the largest smallmouth bass being documented over 2 lbs (Harding et al., 2012).

Family	Common Name	Scientific Name	Status	1973	1978	1979	1980	1981	1982	1983	1984	1986	1987	1987	1997	2001	2008	2009
Samonidae	Bonneville cutthroat trout	*Oncorhynchus clarkii*	N									0.03	0.1					
	Rainbow trout	*Oncorhynchus mykiss*	I									0.02	0.1	0.2			0.2	0.8
	Mountain whitefish	*Prosopium williamsoni*	N	0.3	0.2							0.2	0.5	4.6				
Percidae	Yellow perch	*Perca flavescens*	I	92.2	93.5	90.9	63.7	73.7	98.6	40.0	34.8	3.7	83.5	34.1	4.9	13.7	11.0	12.0
	Walleye	*Sander vitreum*	I		0.1	0.2	10.4	2.3	1.2	3.3	4.3	0.4	0.6	3.3	15.4	12.4	19.7	35.1
Catostomidae	Utah sucker	*Catostomus ardens*	N	4.2	5.2	2.6	4.1	22.6		56.7	52.2	6.2	4.2	4.3			3.0	4.1
Cyprinidae	Common carp	*Cyprinus carpio*	I	0.3	0.4	0.7	1.0		0.1		8.7	82.4	9.5	51.4	79.6	42.6	37.6	24.8
	Spottail shiner	*Notropis hudsonius*	I									4.9	0.4				1.9	3.2
	Redside shiner	*Richardsonius balteatus*	N									1.3	0.5					
	Utah chub	*Gila atraria*	N	0.4	0.6	5.5	20.7	1.5				0.2	0.2	2.0				
Centrarchidae	Bluegill	*Lepomis macrochirus*	I	2.7										0.2				0.2
	Green sunfish	*Lepomis cyanellus*	I									0.6	0.4			22.6	2.8	6.9
	Smallmouth bass	*Micropterus dolomieu*	I													8.6	23.5	12.1
Ictaluridae	Channel catfish	*Ictalurus punctatus*	I										0.02					0.8
Cichlidae	Tilapia	*Oreochromis sp.*	I														0.2	

Source: Harding et al. (2012)

Figure 4.4-1. Relative abundance of fish surveyed in Oneida Reservoir from 1973 to 2009.

Yellow Perch (perch) is a non-native warm water species in the Bear River system. Perch has been documented throughout the Bear River. There is no stocking data available on perch. Past surveys showed that prior to 1980, perch was the dominant fish in Oneida Reservoir comprising 90 percent or more of total abundance during some years (Figure 4.4-1). In 2009, perch was 12.0 percent of the fish community. Anecdotal observations suggest a substantial reduction in the perch population has occurred since the introduction of walleye into Oneida Reservoir.

Other warm-water sport fish found in Oneida Reservoir include bluegill, green sunfish, and channel catfish. Green sunfish is common, contributing 6.9 percent of the catch during the 2008–09 study. Channel catfish have been established in Oneida Reservoir for some time, documented in 1997 during PacifiCorp surveys. More recently, IDFG has been stocking channel catfish in low numbers in Oneida Reservoir beginning in 2018.

Common carp are the second most abundant fish found in Oneida Reservoir. Prior to 1986 numbers of carp were low based on past survey data. In 2008–09 carp were 24.9 percent of the fish captured. However, carp make up most of the biomass in the reservoir at 77.3 percent.

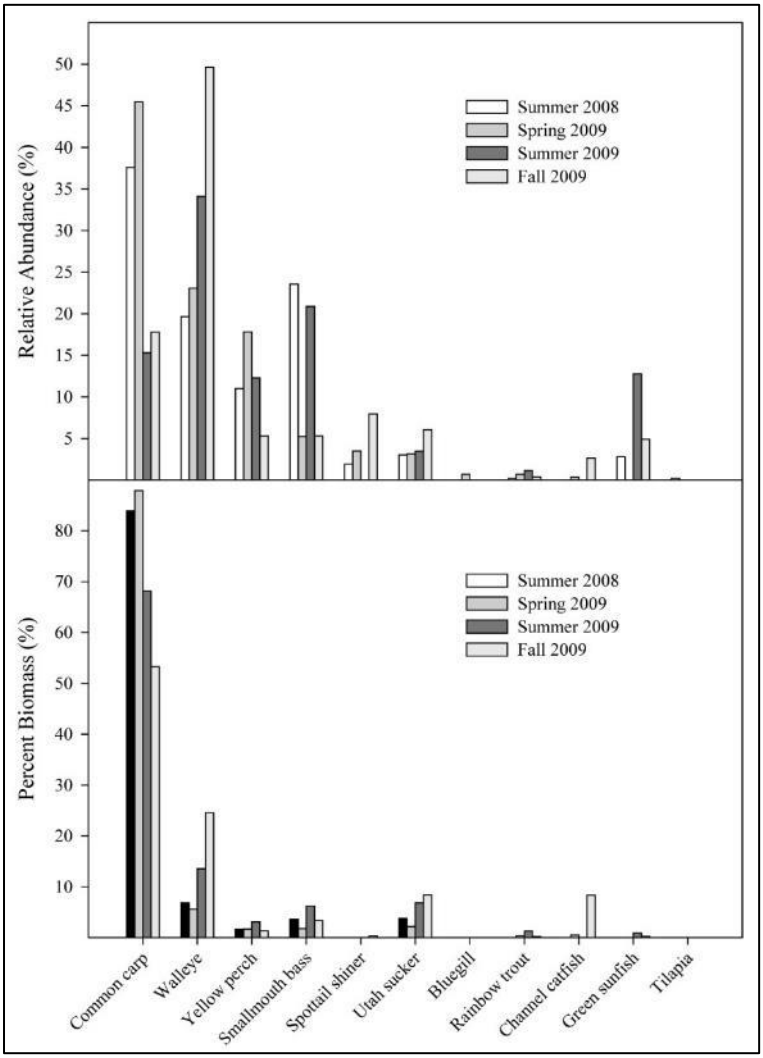
Utah sucker is the only native species documented in recent years in Oneida Reservoir and has been collected in most surveys. No other native species has been documented. Throughout all past surveys, Bonneville cutthroat trout have been collected only six times (Harding et al., 2012). The last Bonneville cutthroat trout recorded in the reservoir was in 1997.

Table 4.4-2. Oneida Reservoir Stocking History.

Species	Quantity	Date
Walleye	420,000	5/19/2023
Channel Catfish	5,004	7/12/2022
Channel Catfish	4,998	7/8/2021
Walleye	490,000	6/11/2021
Channel Catfish	5,015	7/16/2020
Channel Catfish	4,969	7/24/2019
Walleye	495,000	6/7/2019
Channel Catfish	5,005	7/11/2018
Walleye	472,500	6/19/2018
Walleye	393,750	6/2/2017
Rainbow Trout	999	5/10/2017
Walleye	579,000	4/6/2016
Walleye	450,000	6/7/2011
Walleye	500,000	5/23/2010
Walleye	500,000	6/4/2008

Species	Quantity	Date
Walleye	175,000	5/26/2007
Walleye	500,000	6/7/2005
Walleye	500,000	5/23/2001
Walleye	500,000	5/8/2000
Walleye	500,000	5/2/1999
Walleye	250,000	4/30/1998
Walleye	250,000	4/15/1998
Walleye	250,000	4/28/1997
Walleye	250,000	4/13/1997
Walleye	500,000	4/30/1996
Walleye	500,000	4/12/1996
Walleye	500,000	4/30/1995
Walleye	400,000	4/7/1994
Walleye	400,000	4/16/1993
Sauger	315,840	4/22/1992
Walleye	400,000	4/7/1992
Sauger	100,000	4/30/1991
Walleye	200,000	4/10/1991
Walleye	1,006,500	4/7/1988
Spottail Shiner	18,000	6/5/1986
Walleye	2,000,000	4/12/1985
Walleye	3,008,520	4/13/1984
Walleye	1,500,000	4/8/1983
Walleye	700,000	4/10/1979
Walleye	250,000	5/5/1978
Walleye	1,000,000	4/13/1977
Walleye	525,000	4/13/1976

Source: IDFG (2023a)



Source: Harding et al. (2012)

Figure 4.4-2. Relative abundance and percent biomass of fish surveyed in 2008-09 by USU.

		Length (in)				Weight (lb)			
	n	Mean	SD	Min	Max	Mean	SD	Min	Max
Bluegill	2	4.8	0.4	4.5	5.2	0.1	0.0		
Channel catfish	8	21.9	2.1	17.3	23.6	4.7	1.2	2.6	6.1
Common carp	417	21.4	1.9	15.6	26.9	4.7	1.5	1.0	10.0
Green sunfish	81	4.3	1.1	1.1	7.7	0.1	0.05	0.03	0.4
Rainbow trout	9	15.6	2.1	13.5	19.1	1.2	0.3	0.8	1.6
Smallmouth bass	228	8.4	3.0	1.5	15.6	0.4	0.4	0.03	2.0
Spottail shiner	40	3.6	0.9	1.3	4.8	0.1	0.01	0.03	0.1
Tilapia	1	8.5				0.4			
Utah sucker	54	16.6	2.6	11.8	22.9	2.2	1.0	0.8	4.9
Walleye	435	12.0	3.3	5.3	27.8	0.6	0.8	0.1	6.7
Yellow perch	169	8.3	1.3	3.5	11.0	0.3	0.1	0.1	0.6

Source: Harding et al. (2012)

Figure 4.4-3. Table showing mean length and weight of fish surveyed in 2008-09 by USU.

Bear River and Oneida Canyon

The IDFG Riverdale Management Unit (MU) includes the Bear River from the base of Oneida Dam downstream to the Idaho-Utah border. Downstream of the Hwy 34 bridge near Riverdale, studies suggest the Bear River fishery is highly degraded, and most fishing occurs upstream (PacifiCorp, 1999). From Oneida Dam to Riverdale, the Bear River is approximately 11 miles in length. Early studies (1974) showed most of the fishery was dominated by mountain whitefish (97 percent). Brown trout were introduced downstream of Oneida Reservoir and were stocked from 1974 to 1998 (IDFG, 2022). Based on available records, stocking of rainbow trout began in 1985 and continues today (PacifiCorp, 1999). The Bear River downstream of Oneida Dam is managed as a put-and-take fishery.

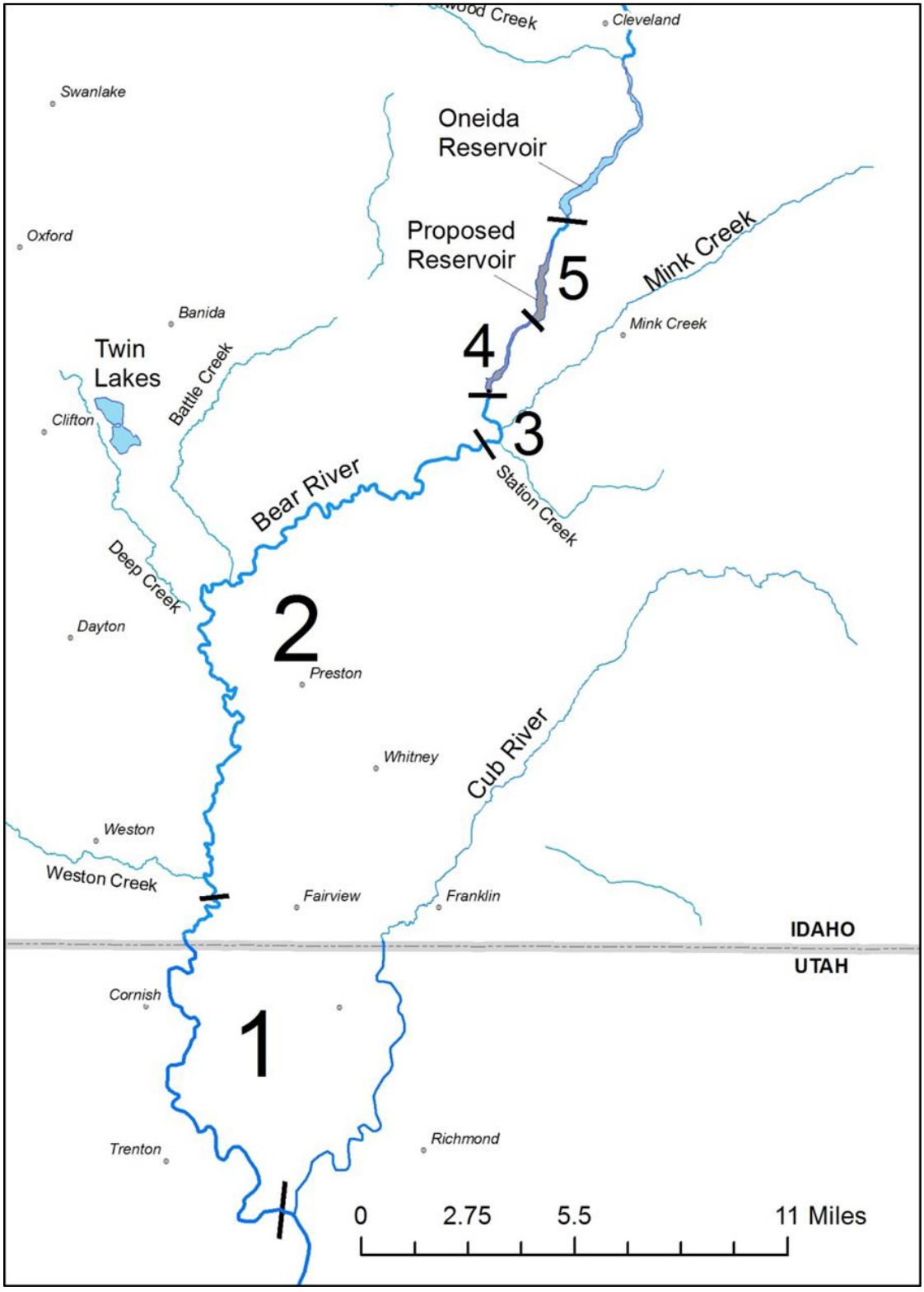
In 1997, a qualitative survey was conducted by PacifiCorp to examine fish assemblage and relative abundance of sport fish (i.e., brown trout, rainbow trout, and mountain whitefish) in Oneida Narrows Canyon. In total, 99 fish were collected during the single pass survey including whitefish (61 percent), brown trout (30 percent), and rainbow trout (8 percent; PacifiCorp, 1999).

More recently, USU completed surveys in four reaches in 2008 and 2009. Areas 4 and 5 are one continuous reach in Oneida Canyon. Four separate mark recapture surveys were conducted, including fall 2008, spring 2009, summer 2009, and fall 2009. Reaches 1 and 2 were downstream of Mink Creek. Approximately 8 miles of the Bear River were covered by Reaches 3 and 4/ 5, beginning just downstream of the confluence of Mink Creek to just downstream of the Oneida Powerhouse (Figure 4.4-4). This survey represents almost the entire Bear River in Oneida Canyon.

The study collected 5,171 fish during the four sampling periods across all reaches (Harding et al., 2012). Utah sucker was the most abundant fish during the study, comprising 36 percent of the catch (Figure 4.4-5). Utah sucker were abundant in Reaches 2, 3, and 4/5 but had low densities in Reach 1. Common carp was the second most abundant species with 19 percent of the catch but was dominant in Reach 1 and steadily decreased upstream. Rainbow trout was the third most abundant species with the highest density in Reach 4/5. Mountain whitefish were the fourth most abundant species with over 9 percent of the captures.

Carp had the highest biomass and fish density in Reach 1, representing over 90 percent of the captures with an estimated 350 to 4,967 fish/mile in 2009 (Harding et al., 2012). All other surveyed species had low occurrence rates (Figure 4.4-6). Utah suckers were the dominant species in Reach 2 with a density of 748 to 1,651 fish/mile, while carp were the second most common with a density of 73 to 649 fish/mile. Fish structure began to change in Reach 3 with the occurrence of more coldwater fishes. Utah sucker remained the most dominant fish in Reach 3 with a density of 502 to 3,716 fish/mile. The second most abundant species in Reach 3 was mountain whitefish with a density of 73 to 972 fish/mile with density being seasonal. Rainbow trout and brown trout were the third and fourth-most collected species in Reach 3. Rainbow trout had an estimated density of 327 fish/mile during the summer survey. Brown trout had a peak density in the fall of 77 fish/mile. Study Reach 4/5 was the most diverse reach with 10 species being collected. Utah sucker was the most common species and had an estimated density of 1,225 fish/mile. Rainbow trout was the second most common fish with an estimated peak density in the summer of 498 fish/mile.

In 2009, Bonneville cutthroat trout were collected in reaches 3 and 4/5 during the spring and fall surveys, no Bonneville cutthroat trout were collected in the summer sampling in 2009. Other notable species collected during the survey were bluehead suckers which were collected in Reach 3 during all three 2009 surveys, and Reach 4/5 during the summer.



Source: Harding et al. (2012)

Figure 4.4-4. Defined reaches of the 2008-2009 study conducted by USU.

			2008	2009			
Family	Species	Status	Fall	Spring	Summer	Fall	Total
Cyprinidae	Common carp	I	22.2	29.6	11.4	16.2	19.3
	Speckled dace	N	0.6		0.3		0.1
Catostomidae	Utah sucker	N	36.5	31.5	40.7	36.9	36.2
	Bluehead sucker	N		0.3	0.7	0.1	0.3
Ictaluridae	Black bullhead	I				0.1	0.02
	Channel catfish	I	0.5	0.7	0.2	0.2	0.4
Salmonidae	Bonneville cutthroat trout	N	0.3	0.3	0.2	0.2	0.2
	Rainbow trout	I	8.5	18.0	24.2	14.2	18.2
	Mountain whitefish	N	3.4	10.6	4.7	11.2	9.2
	Brook trout	I		0.1			0.02
	Brown trout	I	6.5	7.2	4.5	6.5	6.2
Centrarchidae	Green sunfish	I				0.1	0.02
	Bluegill	I	0.5	0.1			0.02
	Smallmouth bass	I	13.1	0.5	11.9	11.1	7.8
	Largemouth bass	I	0.2				
	Black crappie	I				0.5	0.2
Cottidae	Mottled sculpin	N	7.4	0.1	1.2	2.4	1.3
Percidae	Yellow perch	I	0.3			0.2	0.1
	Walleye	I	0.3	1.1	0.1	0.2	0.5
	n =		650	1491	1257	1773	4521

Source: Harding et al. (2012)

Figure 4.4-5. Relative abundance of fishes through 4 reaches sampled by USU.

	Reach 1				Reach 2				Reach 3				Reach 4/5		
	Density		Biomass		Density		Biomass		Density		Biomass		Density		Bior
Spring 2009	fish/mile	fish/acre	lbs/mile	lbs/acre	fish/mile	fish/acre	lbs/mile	lbs/acre	fish/mile	fish/acre	lbs/mile	lbs/acre	fish/mile	fish/acre	lbs/mile
Bonneville cutthroat trout									2.0	0.1	1.5	0.1			
Brown trout									39.0	2.9	32.3	2.4	56.0	4.7	56.4
Rainbow trout					4.0	0.3	2.5	0.2	63.0	4.7	43.8	3.2	236.0	19.8	164.9
Brook trout															
Mountain whitefish					7.0	0.5	8.0	0.5	127.0	9.4	146.7	10.9	122.0	10.2	143.1
Smallmouth bass													4.0	0.3	3.2
Walleye	17.0	1.2	69.9	4.9											
Channel catfish	8.0	0.6	19.8	1.4											
Common carp	4,697.0	328.4	12,871.4	899.9	575.0	37.2	4,904.6	317.6	257.0	19.0	3,215.9	238.5	59.0	4.9	764.6
Bluegill															
Mottled sculpin													1.0	0.1	0.02
Utah sucker					829.0	53.7	3,664.4	237.3	502.0	37.2	2,024.2	149.9	1225.0	102.7	3821.4
Bluehead sucker									1.0	0.1	2.1	0.2			
Cyprinid															
Summer 2009															
Bonneville cutthroat trout															
Brown trout					2.0	0.1	2.0	0.1	21.0	1.6	23.8	1.8	23.0	1.9	22.3
Rainbow trout					4.0	0.3	4.9	0.3	327.0	24.2	199.7	14.8	498.0	41.8	340.3
Mountain whitefish					2.0	0.1	2.7	0.2	73.0	5.4	104.1	7.7	16.0	1.3	20.2
Smallmouth bass	3.0	0.2	2.0	0.1	4.0	0.3	0.6	0.04	108.0	8.0	40.5	3.0	203.0	17.0	57.3
Walleye															
Channel catfish					1.0	0.1	2.3	0.1							
Common carp	350.0	24.5	1186.7	83.0	73.0	4.7	623.3	40.4	22.0	1.6	245.2	18.2	67.0	5.6	700.6
Mottled sculpin									1.0	0.1	0.03	0.002	9.0	0.8	0.2
Utah sucker					748.0	48.4	3316.3	214.8	3716.0	275.2	14222.0	1053.2	417.0	35.0	915.7
Bluehead sucker									4.0	0.3	6.8	0.5	1.0	0.1	1.6
Speckled dace													2.0	0.2	0.01
Fall 2009															
Bonneville cutthroat trout													1.0	0.1	0.8
Bluehead sucker													1.0	0.1	1.5
Brown trout					11.0	0.7	5.3	0.3	77.0	5.7	47.5	3.5	84.0	7.0	87.0
Black bullhead															
Common carp	1973.0	137.9	5954.8	416.3	649.0	42.0	5215.3	337.7	155.0	11.5	1903.7	141.0	96.0	8.0	827.7
Channel catfish	1.0	0.1	1.3	0.1	1.0	0.1	7.1	0.5							
Black crappie	10.0	0.7	0.5	0.04											
Green sunfish															
Rainbow trout					1.0	0.1	1.2	0.1	244.0	18.1	134.5	10.0	269.0	22.6	141.7
Mottled sculpin					8.0	0.5	0.1	0.005	35.0	2.6	0.7	0.1	7.0	0.6	0.2
Smallmouth bass	1.0	0.1	0.1	0.01	11.0	0.7	3.7	0.2	156.0	11.6	45.7	3.4	393.0	32.9	130.0
Utah sucker	1.0	0.1	4.4	0.3	1651.0	106.9	7290.6	472.1	847.0	62.7	3069.9	227.3	1404.0	117.7	3336.7
Walleye													1.0	0.1	2.3
Mountain whitefish					10.0	0.6	3.4	0.2	972.0	72.0	1129.3	83.6	132.0	11.1	122.8
Yellow perch					1.0	0.1	0.01	0.001							

Source: Harding et al. (2012)

Figure 4.4-6. Density and biomass of fishes by reach.

4.4.3 Bonneville Cutthroat Trout

As noted in the introduction to this section (section 4.4), Bonneville cutthroat trout is one of the managements focuses in the Bear River basin. While this species does not currently occur in Oneida Reservoir or the Bear River through Oneida Narrows Canyon, it must be considered in any discussion of potential effects on Bear River system aquatic resources.

Biology and Life History

Bonneville cutthroat trout are one of 14 subspecies of cutthroat trout recognized as native to interior portions of western North America (Behnke, 1992). Fish may be found in a variety of different environments ranging from small headwater streams to rivers and streams at lower elevations to lakes or reservoirs. Individuals feed primarily on aquatic invertebrates and terrestrial insects during their lives (May et al., 1978) but may consume small fish if they attain sufficient size (Lentsch et al., 2000). Growth is largely a function of temperature and site productivity.

Maturity is reached generally by age 2 for males and age 3 for females. In Birch Creek, a small stream in southcentral Utah, Bonneville cutthroat trout became mature in their second year upon reaching about 134 mm total length (TL) as males and 147 mm TL as females (May et al., 1978). Maturity for Bonneville cutthroat trout can occur at a larger size in localities where growth is more rapid. Spawning occurs in late spring when temperatures range from about 4–10^{o}C (May et al., 1978) and chiefly during May and June, although elevation, temperature, and life history strategy can influence the exact timing (USFWS, 2001).

Larval emergence occurs typically during mid to late summer. Precise timing depends largely on when spawning occurs and stream temperatures. The larvae are poor swimmers and migrate or drift downstream, into lower velocity habitats along stream margins. As fish grow, they soon occupy more mid- settling channel habitats (Nielson and Lentsch, 1988).

Bonneville cutthroat trout exhibit four distinct life history adaptations: lacustrine (spawning/rearing occurs in lakes); adfluvial (adults live in lakes, spawn in lake tributaries); fluvial (migration between mainstem river and tributary); and resident (adults remain in stream, no migration). Past studies indicate that a population can exhibit more than one life history strategy, such as a stream population including both fluvial and resident components (Colyer et al., 2005; Randall, 2012).

Habitat loss and fragmentation has caused many populations of fluvial Bonneville cutthroat trout and other native cutthroat to decline or disappear. As a result, there are relatively few remaining fluvial Bonneville cutthroat trout populations available for scientific study. One such study examined movement of radio-tagged adults in the Thomas Fork of the Bear River in Idaho and Wyoming in relation to a diversion structure. Home ranges were more extensive upstream of the structure than downstream of it; however, the researchers noted attempts to ascend the structure in the spring. Substantial portions (>50 percent) of both upstream and downstream groups were mobile (>1 km movement) with median home ranges of about 2 km even during the fall and winter periods, contrary to the relatively sedentary behavior that was expected initially. During spring, some fish had moved as far as 86 km into tributaries of the Thomas Fork, presumably for spawning (Colyer et al., 2005). Related studies documented post-spawning movements of similar

magnitude in the spring of up to 82 km, but fish remained relatively sedentary in the summer when movements did not exceed 0.5 km. They also reported that 23 percent of the radio-tagged fish eventually became entrained in an irrigation diversion (Schrank and Rahel, 2004).

Stream resident populations appear to move far less than fluvial populations, particularly during fall and winter (Hilderbrand and Kershner, 2000).

Conservation Status

Bonneville cutthroat trout were present historically throughout the Bonneville Basin, which was covered by Lake Bonneville during the Pleistocene Epoch up to about 30,000 years ago. The lake encompassed parts of Idaho, Wyoming, Nevada, and Utah. After the lake retreated, cutthroat populations became restricted to headwater streams and lakes. Numbers have dwindled in recent years due to various human activities, raising concerns among resource agencies regarding their future prospects (Lentsch et al., 1997).

Bonneville cutthroat trout are not listed as a Sensitive Species by IDFG but are listed as a Tier I Sensitive Species by the Utah Division of Wildlife Resources. They have also been afforded Sensitive Species status by the USFS Intermountain Region and BLM. In 1992 and 1998, they were unsuccessfully petitioned for listing under the Endangered Species Act (ESA; Lentsch et al., 2000). Most recently, on September 9, 2008, the US Fish and Wildlife Service (USFWS) again concluded there was insufficient cause to list Bonneville cutthroat trout as either threatened or endangered under the ESA (73 FR 52235).

Continuing threats to these fish include: (1) water development projects affecting timing, magnitude, and duration of stream flows; (2) degraded aquatic habitat and water quality; (3) riparian habitat loss; (4) interruption of migratory corridors by manmade barriers; and (5) competition with, predation by, and hybridization with non-native fishes (Lentsch et al., 2000). Potential impacts on upstream and downstream movement of Bonneville cutthroat trout is a principal concern of agencies.

In addition, natural factors such as drought and fire have been shown to impact Bonneville cutthroat trout through vegetation community change, water quality impacts, and other mechanisms (Hepworth et al., 1997; White and Rahel, 2008). Frequency and severity of these events may be exacerbated by ongoing, human-induced global warming, which could further threaten coldwater species like Bonneville cutthroat trout well into the future (Williams et al., 2007; Haak et al., 2010).

To protect Bonneville cutthroat trout from further decline and foster recovery, the State of Idaho developed a Bonneville cutthroat trout Conservation Management Plan (Tuescher and Capsuro, 2007). To facilitate Bonneville cutthroat trout management efforts in Idaho, its known range was separated into six Geographic Management Units (GMUs) extending from the Wyoming State line, the eastern limit of the Bonneville cutthroat trout distribution in Idaho, to the Malad River Basin, to the Utah border. The Bear River Project Boundary is located within four GMUs that include the following: Nounan Valley, Dam Complex, Gentile Valley, and Riverdale. The Bear River Project dams delineate boundaries for three of the four units.

Conservation actions outlined in the Bonneville cutthroat trout Management Plan to guide sustainability efforts in Idaho include: (1) surveys to document population status; (2) genetic analysis to determine purity; (3) reconnecting, protecting, and enhancing important habitats; (4) non-native fish control; (5) reintroduction via broodstock augmentation; and (6) continued monitoring (Tuescher and Capsuro, 2007). All of these activities have been undertaken at some level in Idaho and ongoing efforts are part of these management goals.

Bear River Project Area Studies

As part of the Bear River Settlement Agreement and FERC License Article 403, PacifiCorp developed a Comprehensive Bonneville cutthroat trout Restoration Plan in collaboration with the Bear River Environmental Coordination Committee (ECC), a stakeholder group comprised of signatories to the Settlement Agreement which was formed to consult and make decisions regarding the use of funding and other license requirements for the Bear River Project. PacifiCorp and the ECC have conducted research and improvement projects since the new FERC license was issued, with the ultimate goal of expanding Bonneville cutthroat trout populations to their historic range in the Bear River. This collaborative plan, initiated by PacifiCorp and ECC members in 2004, focused on several key areas including (1) documenting Bonneville cutthroat trout genetics, restoration areas and barriers for survival probability, (2) defining adult movement patterns and migratory ranges because of their relevance to population viability and persistence, and (3) establishing a brood stock program to augment populations and support reintroduction to extirpated tributaries.

Beginning in 1998, IDFG and USFS began collecting fin clips throughout the Bear River Basin in Idaho and Wyoming. Collection concluded in 2005 with approximately 1,200 samples collected from 44 streams and tributaries, generally meeting the goal of obtaining 30 samples from each waterway. The primary objectives included assessing intraspecific and interspecific hybridization and introgression in cutthroat trout within the Bear River drainage and assessing DNA diversity and distribution in cutthroat trout throughout the drainage (Campbell et al., 2006). The study concluded that Bonneville cutthroat trout in the Bear River drainage are a distinct population from Southern Bonneville cutthroat trout found in Utah and remnant numbers in the Malad GMU. Bonneville cutthroat trout in the Bear River exhibit characteristics similar to Yellowstone cutthroat. Only three tributaries showed evidence of hatchery-reared genetic markers found in Henrys Lake, Yellowstone Lake, and Jackson National Fish Hatchery. These results lead investigators to conclude that non-native cutthroat trout are not well adapted to desert conditions of the Bear River drainage. To foster the sustainability of the Bonneville cutthroat trout population, agencies need to identify and preserve core populations within the Bear River drainage.

Telemetry studies were initiated in 2005, with mitigation funding from PacifiCorp and IDFG, to better understand seasonal movement patterns of fluvial Bonneville cutthroat trout in the Bear River. These initial studies focused on the Pegram and Nounan GMUs (upstream of Alexander Reservoir) and were used as a basis for creating the Comprehensive Bonneville cutthroat trout Restoration Plan. Additional telemetry studies were conducted during 2012–14 in the Gentile Valley Complex GMU to monitor whitewater boater flows (WWBF), a FERC license condition providing recreational opportunities. This study involved implanting 108 transponders in Bonneville cutthroat trout to track movements through the Grace bypass reach to determine if high flushing flows (minimum of 700 cfs) would displace Bonneville cutthroat trout in the

canyon. Between April and May of 2013–14, eight WWBF events occurred where fish tracking noted three fish (<3 percent) were displaced as a result of the high flows (ECC, undated).

Population surveys were conducted in 2008–09 by USU from the base of Oneida Dam to the Utah border in five unique study reaches of the Bear River. Two study reaches were on the Bear River from Oneida Dam downstream to below the Mink Creek confluence. Over the study lifetime, Bonneville cutthroat trout were documented during each survey (Harding et al., 2012). While populations were low, Bonneville cutthroat trout numbers were consistent with past surveys conducted downstream of Oneida Dam.

Telemetry studies were conducted in the Bear River from late 2008 to early 2010 downstream of Oneida Dam. A total of 32 Bonneville cutthroat trout were tagged and tracked through the study period. Eleven Bonneville cutthroat trout were collected and tagged from Mink Creek to augment low capture numbers. Bonneville cutthroat trout were noted to swim up Mink Creek to spawn while some attempted to return to the Bear River. One Bonneville cutthroat trout travelled through a series of canals and aqueducts and was later located in Twin Lake Reservoir, while others remained in Mink Creek. The study noted smaller Bonneville cutthroat trout stayed in the Bear River and did not attempt to migrate to spawn. One Bonneville cutthroat trout tagged in Reach 4/5 travelled 20 miles downriver within a few days of tagging and later travelled another 31 miles downstream to near the confluence of the Cub River.

4.4.4 Benthic Macroinvertebrates

Oneida Reservoir

PacifiCorp completed an invertebrate study in 1997 in Oneida Reservoir at three sites including near Oneida Dam and the middle and upper reservoir areas. All samples were taken at depths of 2–6 meters using an Eckman dredge. Samples were collected at depths where normal operations and fluctuations would not affect densities in the samples. The survey identified nine taxa near the Dam, six taxa at the middle reservoir site, and three taxa at the upper reservoir site (PacifiCorp, 1999). The dominant taxa across all three sites were oligochaetes (round worms) comprising 48 to 56 percent of all species. Chironomids contributed 38 to 50 percent of all species. The highest densities of invertebrates were found near the dam.

Bear River Downstream of Oneida Dam

USU conducted a longitudinal study of invertebrates downstream of the Oneida Dam through the five study reaches (Figure 4.4-4). D-nets (kick nets) were used in the data collection to exam species composition. Relative abundance and composition were calculated in the study.

Chironomids were the most abundant family sampled across all reaches (Figures 4.4-7, 4.4-8, 4.4-9, 4.4-10, and 4.4-11). Hydropsychidae was the second most abundant and during the August sample period they were more abundant in Reaches 3, 4, and 5 than chironomids. Ephemeroptera were found in every reach with Reaches 3, 4, and 5 having five families.

		Total	September	August	July	March
Ephemeroptera	Baetidae	3.1%	3.5%	6.9%	5.2%	0.0%
	Tricorythid	4.8%	2.8%	2.8%	12.1%	0.9%
	Leptophlebi	8.4%	16.9%	5.6%	0.0%	10.5%
	Heptageniid	3.6%	1.4%	11.1%	0.0%	5.5%
	Siphlonurid	2.8%	2.1%	0.0%	0.0%	6.4%
Plecoptera	Perlodidae	0.2%	0.7%	0.0%	0.0%	0.0%
Trichoptera	Glossosoma	1.3%	1.4%	2.8%	1.2%	0.9%
	Rhyacophili	0.8%	1.4%	1.4%	0.6%	0.5%
	Hydropsych	13.7%	4.9%	26.4%	9.8%	18.3%
	Leptocerida	4.6%	4.9%	9.7%	4.0%	3.2%
	Psychomyii	0.2%	0.7%	0.0%	0.0%	0.0%
Diptera	Simuliidae	6.4%	14.8%	8.3%	3.5%	2.7%
	Chironomid	49.7%	43.0%	25.0%	63.6%	51.1%
Odonata	Coenagrido	0.2%	0.7%	0.0%	0.0%	0.0%
Lepidoptera	Pyralidae	0.2%	0.7%	0.0%	0.0%	0.0%

Source: USU (2012)

Figure 4.4-7. Relative abundance of invertebrates sampled in reach 5.

		Relative	October	August	July	March
Ephemeroptera	Baetidae	19.2%	11.0%	2.3%	26.3%	19.8%
	Tricorythidae	12.1%	3.7%	7.0%	29.6%	1.4%
	Leptophlebiidae	9.6%	6.1%	0.0%	0.0%	21.3%
	Heptageniidae	4.3%	6.1%	0.0%	0.0%	8.2%
	Siphlonuridae	2.2%	0.0%	0.0%	0.0%	5.3%
Trichoptera	Rhyacophilidae	0.8%	4.9%	0.0%	0.0%	0.0%
	Hydropsychidae	15.9%	9.8%	55.8%	8.4%	16.4%
Diptera	Simuliidae	0.6%	3.7%	0.0%	0.0%	0.0%
	Chironomidae	33.5%	51.2%	27.9%	35.8%	25.6%
Lepidoptera	Pyralidae	0.4%	0.0%	0.0%	0.0%	1.0%
Hemiptera	Gerridae	0.8%	2.4%	0.0%	0.0%	1.0%
	Saldidae	0.2%	1.2%	0.0%	0.0%	0.0%
Other	Hirudinea	0.0%	0.0%	0.0%	0.0%	0.0%
	Turbellaria	0.2%	0.0%	2.3%	0.0%	0.0%
	Physidae	0.4%	0.0%	4.7%	0.0%	0.0%

Source: USU (2012)

Figure 4.4-8. Relative abundance of invertebrates in Reach 4.

		Relative	October	August	July	March
Ephemeroptera	Baetidae	12.6%	8.1%	3.4%	29.3%	12.0%
	Tricorythidae	7.9%	1.6%	6.9%	20.7%	6.8%
	Leptophlebiidae	8.6%	6.5%	0.0%	3.4%	12.0%
	Heptageniidae	6.5%	17.7%	0.0%	0.0%	6.8%
	Siphlonuridae	0.5%	0.0%	0.0%	0.0%	0.8%
Trichoptera	Rhyacophilidae	2.7%	0.0%	0.0%	0.0%	4.5%
	Hydropsychidae	17.1%	22.6%	50.0%	31.0%	5.6%
Diptera	Simuliidae	3.8%	12.9%	5.2%	5.2%	1.1%
	Tipulidae	0.5%	0.0%	0.0%	0.0%	0.8%
	Chironomidae	35.6%	30.6%	34.5%	10.3%	42.5%
Lepidoptera	Pyralidae	1.1%	0.0%	0.0%	0.0%	1.9%
Other	Lymnaeidae	1.4%	0.0%	0.0%	0.0%	2.3%
	Physidae	1.8%	0.0%	0.0%	0.0%	3.0%
	Talitridae	0.0%	0.0%	0.0%	0.0%	0.0%

Source: USU (2012)

Figure 4.4-9. Relative abundance of invertebrates in Reach 3.

		Relative	October	August	July	March
Ephemeroptera	Baetidae	7.2%	4.7%	11.9%	10.8%	4.7%
	Tricorythidae	2.6%	2.4%	7.1%	1.4%	1.9%
	Leptophlebiidae	7.5%	3.5%	0.0%	1.4%	17.9%
	Heptageniidae	10.1%	2.4%	0.0%	0.0%	27.4%
Trichoptera	Rhyacophilidae	1.6%	0.0%	0.0%	0.0%	4.7%
	Hydropsychidae	6.0%	11.0%	7.0%	7.0%	0.0%
	Leptoceridae	1.3%	1.2%	2.4%	0.0%	3.0%
	Psychomyiidae	0.3%	1.2%	0.0%	0.0%	0.0%
Diptera	Simuliidae	16.9%	25.9%	11.9%	24.3%	6.6%
	Tipulidae	0.7%	0.0%	0.0%	0.0%	1.9%
	Empididae	1.0%	1.2%	2.4%	0.0%	0.9%
	Chironomidae	22.8%	35.3%	35.7%	16.2%	12.3%
Coleoptera	Elmidae	1.0%	0.0%	2.4%	2.7%	0.0%
	Staphlylinidae	0.7%	0.0%	0.0%	2.7%	0.0%
	Hydrophilidae	6.2%	5.9%	0.0%	12.2%	4.7%
Odonata	Coenagridonidae	3.3%	0.0%	2.4%	0.0%	8.5%
Lepidoptera	Pyralidae	0.3%	0.0%	0.0%	0.0%	0.9%
Hemiptera	Saldidae	3.3%	0.0%	4.8%	10.8%	0.0%
Other	Hirudinea	0.3%	0.0%	2.4%	0.0%	0.0%
	Turbellaria	2.0%	5.9%	2.4%	0.0%	0.0%
	Lymnaeidae	2.0%	0.0%	7.1%	4.1%	0.0%
	Physidae	3.3%	0.0%	0.0%	6.8%	4.7%

Source: USU (2012)

Figure 4.4-10. Relative abundance of invertebrates in Reach 2.

		Relative	October	August	July	March
Ephemeroptera	Baetidae	5.0%	0.0%	12.7%	2.9%	1.8%
	Tricorythidae	6.1%	11.8%	3.6%	2.9%	7.0%
	Leptophlebiidae	2.2%	0.0%	0.0%	0.0%	7.0%
	Heptageniidae	5.0%	8.8%	0.0%	5.7%	7.0%
Plecoptera	Brachycentridae	0.6%	0.0%	0.0%	2.9%	0.0%
Trichoptera	Rhyacophilidae	1.1%	0.0%	1.8%	0.0%	1.8%
	Hydropsychidae	4.0%	11.0%	11.0%	0.0%	0.0%
	Leptoceridae	7.0%	4.0%	0.0%	6.0%	20.0%
	Simuliidae	12.7%	2.9%	14.5%	22.9%	10.5%
Diptera	Chironomidae	25.4%	32.0%	21.8%	8.6%	27.0%
	Elmidae	5.5%	0.0%	12.7%	8.6%	0.0%
Coleoptera	Hydrophilidae	5.0%	5.9%	3.6%	5.7%	5.3%
	Coenagridonidae	1.7%	0.0%	0.0%	2.9%	3.5%
Odonata	Pyralidae	2.8%	8.8%	0.0%	5.7%	0.0%
Lepidoptera	Gerridae	1.7%	2.9%	1.8%	2.9%	0.0%
Hemiptera	Saldidae	1.1%	0.0%	3.6%	0.0%	0.0%
	Hirudinea	2.8%	2.9%	0.0%	5.7%	3.5%
Other	Turbellaria	6.1%	8.8%	9.1%	8.6%	0.0%
	Lymnaeidae	2.8%	0.0%	3.6%	0.0%	5.3%
	Physidae	1.7%	0.0%	0.0%	8.6%	0.0%

Source: USU (2012)

Figure 4.4-11. Relative abundance of invertebrates in Reach 1.

4.4.5 Aquatic Invasive Species

Idaho's Strategic Action Plan for Invasive Species is a statewide effort to limit the introduction and spread of invasive species. Invasive species are plants and animals that are not native to an area and have the potential to spread uncontrollably. Aquatic nuisance species are invasive plants and animals that depend on aquatic and riparian ecosystems. No information could be gleaned from online sources that would suggest invasive aquatics such as quagga or zebra mussels have been documented in the Bear River. There are many non-native fish species introduced into the Bear River system that pose a threat to Bonneville cutthroat trout.

4.4.6 Fish Stocking

Fish stocking is discussed above in section 4.4.2, *Fish Community*.

4.4.7 Fish Entrainment and Turbine Mortality

There are no known fish entrainment or turbine mortality studies for the Oneida development of the Bear River Project.

4.4.8 Migratory Fish

The Bear River terminates in the Great Salt Lake in Utah and is considered a closed basin. There are no diadromous fish.

4.4.9 Essential Fish Habitat

There is no federally designated essential fish habitat in the Bear River Project area.

4.4.10 Existing Protection, Mitigation, and Enhancement Measures

Measures addressing BCT are discussed in section 4.4.3, *Bonneville Cutthroat Trout*. There are many, involving federal and state agencies as well as PacifiCorp and other entities. Beyond that, sport fish are protected through IDFG fisheries management that includes seasons, bag limits, and tackle restrictions.

4.5 WILDLIFE AND BOTANICAL RESOURCES

4.5.1 Upland Habitats

The proposed Oneida Pumped Storage Facility and the Oneida Development are located in the Semiarid Hills and Low Mountains ecoregion of the Northern Basin and Range ecoregion in southeastern Idaho. While this ecoregion is predominantly made up of sagebrush steppe, there are seven unique upland habitat types in the Project area (USGS, 2011), as described below. Dominant plant species and representative wildlife species associated with each habitat type are also identified. Wetland, riparian, and littoral habitats are discussed in section 4.6, *Wetlands, Riparian, and Littoral Habitat*. Table 4.5-1 presents the land cover within the Oneida Project Boundary based on the GAP/LANDFIRE National Terrestrial Ecosystems (USGS, 2016), which classifies vegetation types, with the goal of mapping biodiversity and species habitats for management (Jennings, 2000).

Sagebrush Steppe

Sagebrush steppe is the dominant cover type at the Project and is relatively evenly distributed within and around the Oneida Development. This cover type consists of big sagebrush (*Artemisia tridentata*) along with a variety of perennial grasses, including bluebunch wheatgrass (P*seudoroegneria spicata*), intermediate wheatgrass (*Thinopyrum intermedium*), and Idaho fescue (*Festuca idahoensis*). Forbs may also be present, including clover (*Trifolium* spp.), dandelion (*Taraxacum officinale*), and yarrow (*Achillea millefolium*). The presence of grasses and forbs provides high-quality habitat for many sagebrush-obligate wildlife species that use grass for forage and cover. Representative wildlife found in the sagebrush steppe includes mule deer (*Odocoileus hemionus*), pronghorn antelope (*Antilocapra americana*), jackrabbit (*Lepus*

californicus), grasshopper sparrow (*Ammodramus savannarum*), and western meadowlark (*Sturnella neglecta*), as well the species listed below for the sagebrush-juniper cover type.

Maple Woodland

The maple woodland cover type is found throughout the Project area and the Oneida Development in ravines and on steep slopes surrounding the Oneida Reservoir. These woodlands generally occur with rocky soils and high soil moisture. This cover type consists of bigtooth maple (*Acer grandidentatum*) and various conifers. It creates ideal habitat for many songbirds including black-headed grosbeak (*Pheucticus melanocephalus*), western tanager (*Piranga ludoviciana*), and lazuli bunting (*Passerina amoena*). Mammals found in maple woodlands include mule deer and golden-mantled ground squirrels (*Callospermophilus lateralis*).

Riparian Woodland

The riparian woodland cover type occurs primarily within the floodplain of the Oneida Reservoir. It is dependent on annual floods and lies between the sagebrush steppe/maple woodland cover types and the Oneida Reservoir. A variety of trees are found in this cover type, including box elder (*Acer negundo*), narrowleaf cottonwood (*Populus angustifolia*), and Douglas fir (*Pseudotsuga menziesii*). This cover type provides habitat for a diversity of wildlife including bald eagle (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), yellow warbler (*Setophaga petechia*), Yuma myotis (*Myotis yumanensis*), and northern leopard frog (*Lithobates pipiens*).

Mountain Mahogany Shrubland

The mountain mahogany shrubland occurs adjacent to the maple woodland cover type on rocky ridges and slopes surrounding the Project. This cover type is dominated by curlleaf mountain mahogany (*Cercocarpus ledifolius*), with other shrubs such as big sagebrush and antelope bitterbrush (*Purshia tridentata*). Some bunchgrass undergrowth may be present including bluebunch wheatgrass and Idaho fescue. Mountain mahogany shrublands offer habitat to a variety of birds including green-tailed towhee (*Pipilo chlorurus*), small mammals like long-tailed vole (*Microtus longicaudus*), and snakes including the gopher snake (*Pituophis catenifer*).

Sagebrush-Juniper Woodland

Inter-mixed with the riparian woodland cover type, sagebrush-juniper woodland occurs near the Oneida Reservoir shoreline. Dominant/co-dominant plant species include big sagebrush and juniper (*Juniperus osteosperma*). Tree density varies from open to more dense woodland stands. Sagebrush density is also variable. Other species that may be present in this habitat type include Idaho fescue (*Festuca idahoensis*), Sandberg bluegrass (*Poa secunda*), slender wheatgrass (*Elymus trachycaulus*), and various forbs, such as dandelion and yarrow.

The ongoing decline in sagebrush habitat across the western United States has been coupled with a significant expansion of juniper into sagebrush communities. While some wildlife species readily use juniper, other sagebrush-obligate species have experienced population declines concurrent with the declining sagebrush habitat quality and extent (Rowland et al., 2008). The sagebrush and scattered junipers provide habitat for species such as mule deer, coyote (*Canis latrans*), sage thrasher (*Oreoscoptes montanus*), and Brewer's sparrow (*Spizella breweri*).

Cultivated Land

Cultivated land includes fields that are used for crop production and are typically worked as part of farming operations around the Project and the Oneida Development. Most of the cultivated land is found on the north side of Oneida Reservoir. A variety of crops are grown on cultivated lands, including wheat, potatoes, alfalfa, grass hay, and pasture. These cultivated lands can provide elements of habitat for wildlife species including mule deer, coyote, Sandhill crane (*Grus canadensis*), and loggerhead shrike (*Lanius ludovicianus*).

Developed Land

Developed lands include recreational access and day-use areas, private homes, PacifiCorp facilities, and roads. This habitat type may provide wildlife habitat in the form of large, deciduous trees including cottonwood (*Populus* spp.), willow (*Salix* spp.), and box elder, and mowed grasses. The large trees provide habitat elements that are not widely available at the Project and the Oneida Development, including valuable raptor perches for species such as bald eagle and osprey. Additionally, large trees are often selected as nesting habitat for many migratory bird species, including black-billed magpies (*Pica hudsonia*), American crow (*Corvus brachyrhynchos*), and American robin *(Turdus migratorius),* and they may also provide roosting habitat for a variety of bat species. Some mammal species have become adept at using park-like habitat, including northern raccoon (*Procyon lotor*) and western spotted skunk (*Spilogale gracilis*).

Table 4.5-1 Land cover within the Oneida Project Boundary and proposed Oneida Pumped Storage Facility boundary.

Land Cover	Oneida Project Boundary		Proposed Oneida Pumped Storage Facility	
	Area (acres)	Percentage	Area (acres)	Percentage
Developed, Low Intensity	4.0	0.3%	–	–
Developed, Open Space	115.9	7.3%	0.9	0.2%
Inter-Mountain Basins Aspen-Mixed Conifer Forest and Woodland	–	–	1.1	0.3%
Inter-Mountain Basins Big Sagebrush Shrubland	75.4	4.7%	9.3	2.3%
Inter-Mountain Basins Big Sagebrush Steppe	115.0	7.2%	1.8	0.4%
Inter-Mountain Basins Cliff and Canyon	26.7	1.7%	1.3	0.3%
Inter-Mountain Basins Curl-leaf Mountain Mahogany Woodland and Shrubland	10.0	0.6%	23.1	5.7%
Inter-Mountain Basins Juniper Savanna	151.9	9.5%	7.8	1.9%
Inter-Mountain Basins Montane Sagebrush Steppe	1.1	0.1%	173.9	42.7%
Inter-Mountain Basins Semi-Desert Grassland	4.7	0.3%	–	–
Inter-Mountain Basins Semi-Desert Shrub Steppe	7.1	0.4%	–	–
Introduced Upland Vegetation - Annual Grassland	16.0	1.0%	–	–
North American Arid West Emergent Marsh	42.5	2.7%	–	–
Northern Rocky Mountain Lower Montane Riparian Woodland and Shrubland	8.0	0.5%	5.8	1.4%
Northern Rocky Mountain Subalpine Deciduous Shrubland	–	–	1.8	0.4%
Open Water (Fresh)	473.9	29.7%	–	–
Pasture/Hay	134.3	8.4%	–	–

Land Cover	Oneida Project Boundary		Proposed Oneida Pumped Storage Facility	
	Area (acres)	Percentage	Area (acres)	Percentage
Recently burned forest	8.5	0.5%	42.0	10.3%
Rocky Mountain Aspen Forest and Woodland	0.9	0.1%	–	–
Rocky Mountain Bigtooth Maple Ravine Woodland	12.0	0.8%	117.0	28.7%
Rocky Mountain Cliff, Canyon and Massive Bedrock	0.9	0.1%	–	–
Rocky Mountain Lodgepole Pine Forest	0.2	0.0%	–	–
Rocky Mountain Lower Montane Riparian Woodland and Shrubland	387.6	24.3%	21.8	5.3%
Southern Rocky Mountain Mesic Montane Mixed Conifer Forest and Woodland	0.4	0.0%	–	–
TOTAL	1,597	100.0%	407.6	100.0%

Source: USGS (2019)

4.5.2 Invasive Species and Noxious Weeds

Invasive species and noxious weeds are one of the largest disruptors of ecosystem function. They can colonize a variety of habitats, reproduce rapidly with a variety of mechanisms, and aggressively out-compete native species. A plant is designated noxious in Idaho when it is considered to be injurious to public health, agriculture, recreation, wildlife, or property (https://invasivespecies.idaho.gov/plants).

Invasive and noxious weeds may be present within the expanded Oneida Project Boundary, particularly in disturbed areas and along roads and trails. Invasive and noxious weed species present in or near the Project may include hound's tongue (*Cynoglossum officianale*), Dyer's woad *(Isatis tinctoria),* field bindweed *(Convolvulus arvensis),* hoary Cress *(Cardaria draba),* musk thistle *(Carduus nutans),* perennial pepperweed (*Lepidium latifolium*), poison hemlock (*Conium maculatum*), Scotch thistle (*Onopordum acanthium L.*) (Oneida Site Plan; Cirrus, 2015).

4.5.3 Commercially, Recreationally, and Culturally Important Species

Hunting is an important recreational activity within and around lands of the Project and the Oneida Development. Hunting is allowed on PacifiCorp lands of the Oneida Project Boundary in accordance with state hunting regulations. Upland game hunting occurs within the expanded Oneida Project Boundary. The Project and the Oneida Development are located within Game Management Unit 77 and the Bear River Elk Management Zone. Unit 77 provides hunting opportunities for big game including deer and elk, upland birds including ring-necked pheasant (*Phasianus colchicus*), wild turkey (*Meleagris gallopavo*), and sharp-tailed grouse (*Tympanuchus phasianellus*), small game including rabbits and hare, and waterfowl, including ducks and geese. Harvest statistics from this unit show that most of the hunting around the Project targets mule deer and upland birds. Data from IDFG indicates that there are no big game migration routes or stopover records at or around the Project (IDFG, 2023b).

4.5.4 Existing Protection, Mitigation, and Enhancement Measures

Field observations during the site planning process for PacifiCorp's Land Management and Buffer Plans for the Bear River Project (Cirrus, 2011) identified several impacts to wildlife habitat on PacifiCorp property associated with the Oneida Development. This included degraded riparian habitat along the river and its tributaries due to livestock grazing and dispersed recreation, the encroachment of roads, and road grading.

Implementation of PacifiCorp's Land Management and Buffer Plans has addressed these issues through marking and demarcating PacifiCorp lands, blocking sites where dispersed vehicular access had led to degraded riparian and wetland conditions. Gates and "no trespassing" signs have been erected at the pedestrian bridge by the powerhouse, the "lawn area," and the "old camp," to prevent damage associated with inappropriate use. Impacts from dispersed camping, such as fire rings and debris, have been cleaned up and monitored to ensure natural vegetation returns. Incompatible agricultural leases around recreation sites have been terminated. Cooperative efforts are underway with Franklin County and the BLM to better control off-highway vehicles (OHV) and recreation use (Cirrus, 2011).

PacifiCorp implements weed control measures as needed. Where areas were degraded by trespass grazing or intense recreation use, native grasses and vegetation are being reestablished. Fire danger is minimized by restricting vehicular access and removing fire rings. Abandoned agricultural leases have been replanted with native grasses (Cirrus, 2011).

4.6 WETLANDS, RIPARIAN AND LITTORAL HABITAT

The FWS classification scheme for wetlands serves as the national standard for wetland classification and is used to classify wetlands appearing in the National Wetlands Inventory (NWI; FGDC, 2013). NWI coverage is developed from aerial photography, and FWS defines wetlands as:

> ...lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For the purpose of the classification wetlands must have one or more of these three attributes: (1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is nonsoil and is saturated with water or covered by shallow water at some time during the growing season of each year.

The NWI uses a hierarchal classification system to describe wetlands, progressing from systems and subsystems at the most general levels to classes, subclasses, and dominance types, with special modifiers to describe wetlands and deepwater habitats that have been created or modified by humans or by beaver activity (FGDC, 2013). A synopsis of the NWI classification structure is provided in FGDC (2013).

NWI mapping was used to determine and describe the types of wetlands, riparian areas, and littoral habitats within the Oneida Project Boundary and the flowline and upper reservoir of the proposed Oneida Pumped Storage Facility. Overall, there are seven wetland classes within the existing Oneida Project Boundary and two additional wetland classes within 100 meters of the existing Oneida Project Boundary (Table 4.6-1; Figures 4.6-1 through 4.6-4). These wetland classes are discussed in more detail in sections 4.6.1 through 4.6.8.

Table 4.6-1. NWI wetlands in the current Oneida Project Boundary.

NWI Class	NWI Code	NWI Code Description	Area within the Oneida Project Boundary (acres)	Area within a 100 m Buffer around the Oneida Project Boundary (acres)
Lacustrine Limnetic Unconsolidated Bottom	L1UBHh	Limnetic unconsolidated bottom permanently flooded impounded	426.4	0.0
Palustrine Emergent Wetland	PEM1A	Emergent persistent temporarily flooded	10.8	0.0
	PEM1C	Emergent persistent seasonally flooded	3.1	0.3
	PEM1Ch	Emergent persistent seasonally flooded impounded	1.3	0.0
	PEM1Fh	Emergent persistent semi-permanently flooded impounded	4.6	0.0
		Subtotal	19.8	0.3
Palustrine Forested	PFO1A	Forested broad-leaved deciduous temporarily flooded	4.2	0.0
	PFO1C	Forested broad-leaved deciduous seasonally flooded	14.1	0.0
		Subtotal	18.3	0.0
Palustrine Scrub-Shrub	PSS1A	Scrub-shrub broad-leaved deciduous temporarily flooded	0.9	6.8
	PSS1C	Scrub-shrub broad-leaved deciduous seasonally flooded	8.2	0.0
		Subtotal	9.1	6.9
Palustrine Unconsolidated Bottom	PUBF	Unconsolidated bottom semi-permanently flooded	0	0.7
	PUBH	Unconsolidated bottom permanently flooded	0	0.3
		Subtotal	0	1.0
Riverine Lower Perennial Unconsolidated Bottom	R2UBHx	Lower perennial unconsolidated bottom permanently flooded excavated	0	2.4

NWI Class	NWI Code	NWI Code Description	Area within the Oneida Project Boundary (acres)	Area within a 100 m Buffer around the Oneida Project Boundary (acres)
Riverine Upper Perennial Unconsolidated Bottom	R3UBH	Upper perennial unconsolidated bottom permanently flooded	1335.9	0.0
Riverine Intermittent Streambed	R4SBC	Intermittent streambed seasonally flooded	47.2	7.0
Riverine Unknown Perennial Unconsolidated Bottom	R5UBFx	Unknown perennial unconsolidated bottom semi-permanently flooded excavated	0	<0.1
	R5UBH	Unknown perennial unconsolidated bottom permanently flooded	1.8	0.2
		Subtotal	1.8	0.2
Total Wetland Area			1858.5	17.9

Source: FWS (2023), as modified by PacifiCorp

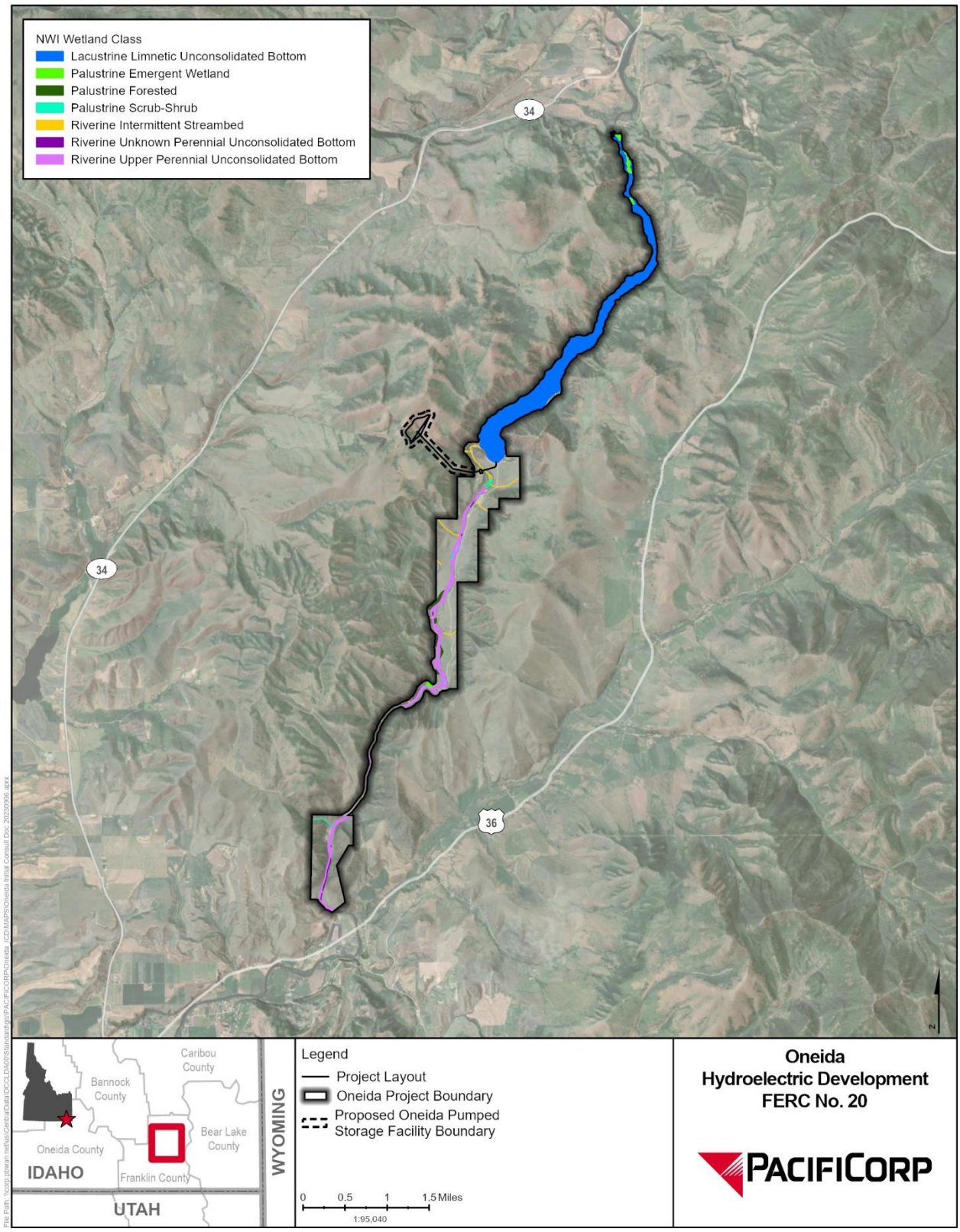


Figure 4.6-1. NWI wetlands in the Oneida Project Boundary.

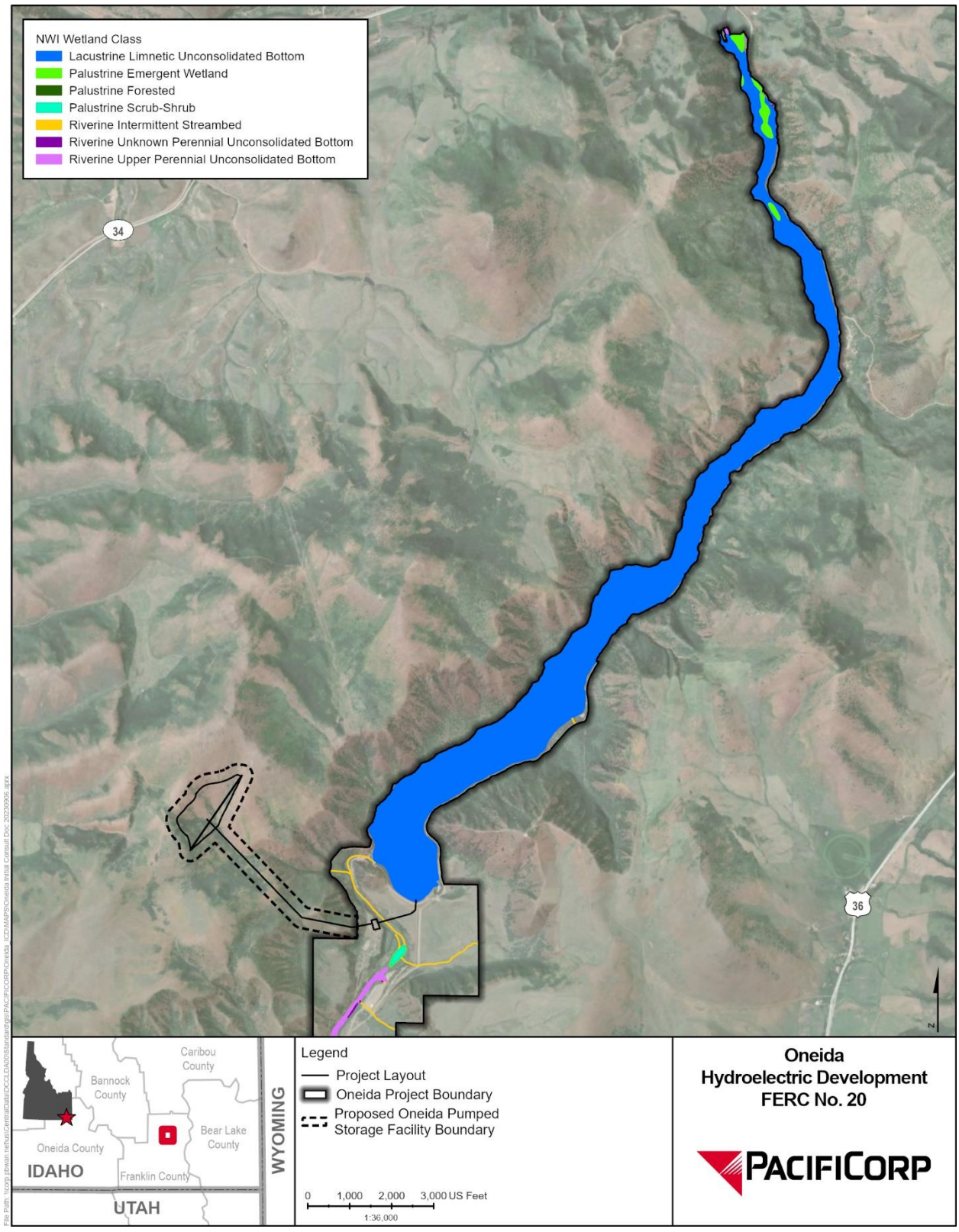


Figure 4.6-2. NWI wetlands around the Oneida Reservoir and proposed Oneida Pumped Storage Facility.

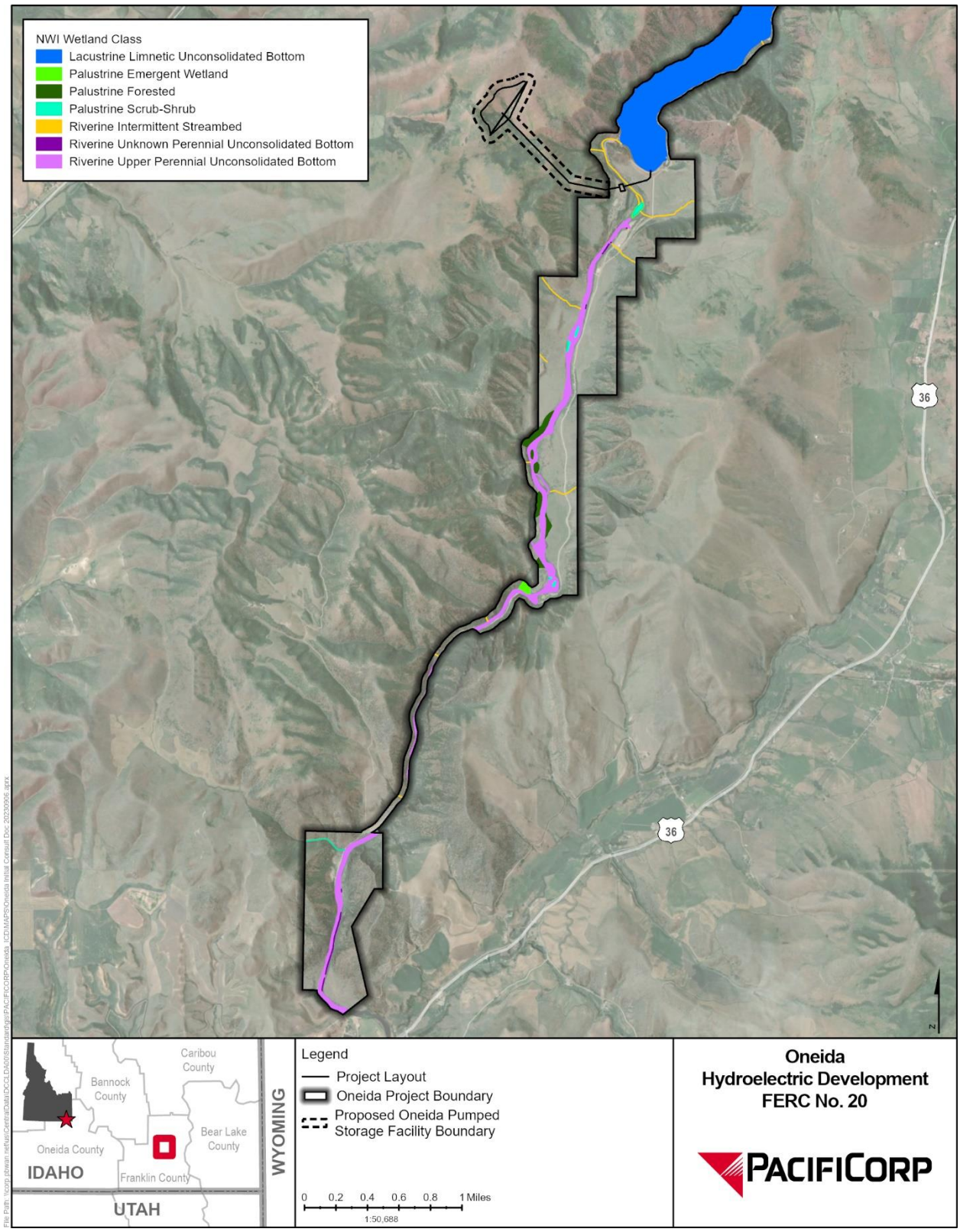


Figure 4.6-3. NWI wetlands downstream of the Oneida Dam.

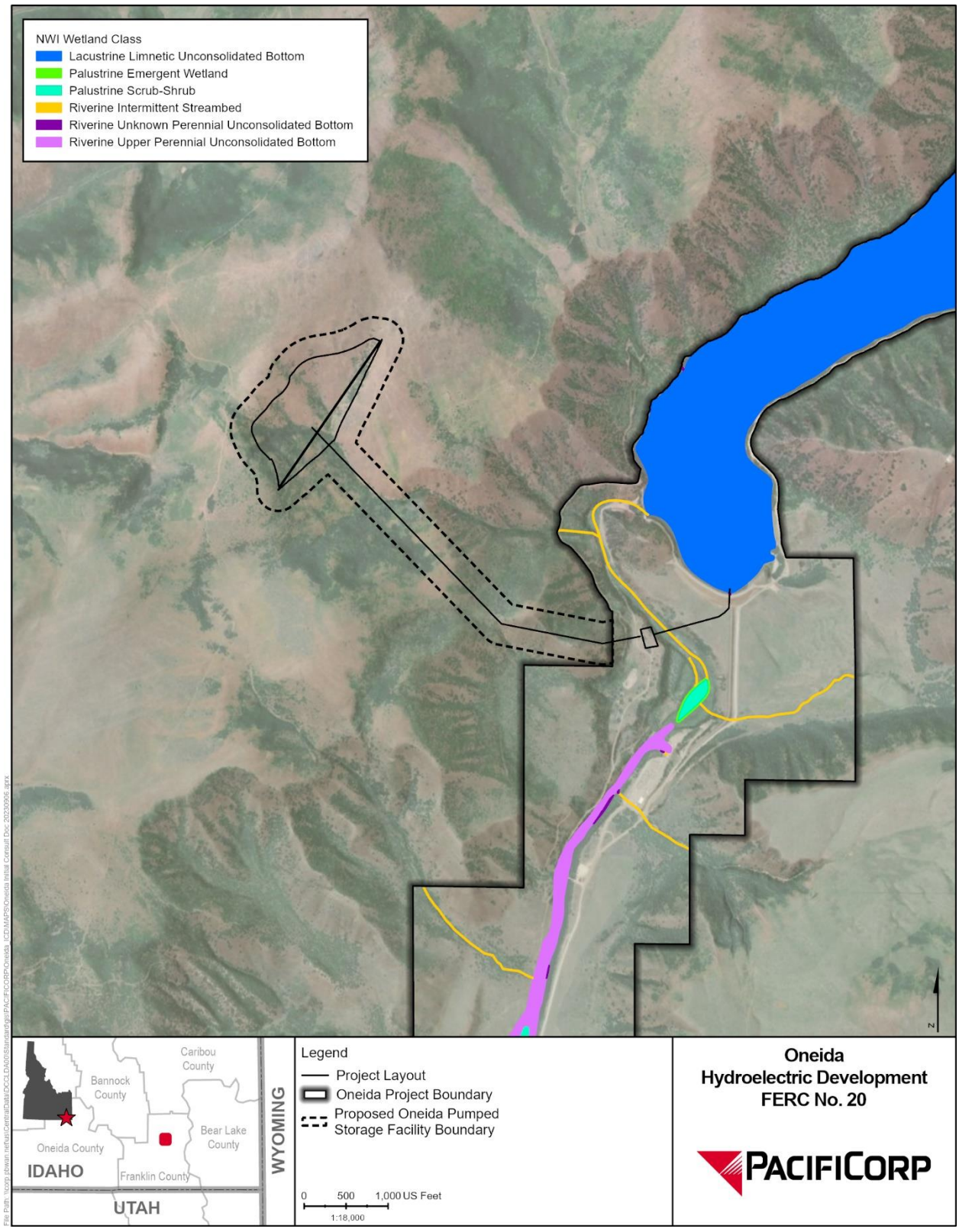


Figure 4.6-4. NWI wetlands around the proposed Oneida Pumped Storage Facility.

4.6.1 Lacustrine Limnetic Unconsolidated Bottom

Lacustrine limnetic unconsolidated bottom habitat is associated with lakes. The lacustrine system includes wetlands and deepwater habitats with all of the following characteristics: (1) situated in a topographic depression or a dammed river channel; (2) lacking trees, shrubs, persistent emergents, emergent mosses, or lichens with 30 percent or greater areal coverage; and (3) total area of at least 20 acres. The limnetic subsystem includes all deepwater habitats in the lacustrine system, areas greater than or equal to 2.5 meters deep below low water. Unconsolidated bottom includes deepwater habitats with at least 25 percent cover of particles smaller than stones and a vegetative cover less than 30 percent. The lacustrine limnetic habitat of Oneida Reservoir is generally void of vegetation but may support some floating plant species. The open-water habitat provides resting areas and foraging habitat for waterbirds. In total, there are 426.4 acres of lacustrine limnetic unconsolidated bottom habitat within the Oneida Project Boundary.

4.6.2 Palustrine Emergent Wetland

Palustrine emergent wetlands are inland, nontidal wetlands characterized by emergent plants—i.e., erect, rooted, herbaceous hydrophytes, excluding mosses and lichens, with at least 30 percent areal coverage. These wetlands are typically dominated by perennial plants and vegetation is present for most of the growing season. Palustrine emergent wetlands are often located along shorelines. Common plants of palustrine emergent wetlands include cattail (*Typha latifolia*), reed canarygrass (*Phalaris arundinacea*), bulrush (*Scirpus spp.*), sedges (*Carex spp.*), rushes (*Juncus spp.*), and smartweeds (*Polygonum spp.*) (PacifiCorp, 1999). Emergent vegetation provides foraging, hiding, and nesting habitat for a variety of aquatic and semi-aquatic species, including songbirds, wading birds, insects, and fish. Within the Oneida Project Boundary, there are 19.8 acres of palustrine emergent wetland, with an additional 0.3 acres within 100 meters of the boundary.

4.6.3 Palustrine Forested

Trees, or woody plants at least 6 meters in height, are the dominant life form in palustrine forested wetlands, with at least 30 percent areal cover. Palustrine forested wetlands typically include an overstory of trees, an understory of young trees and shrubs, and an herbaceous layer. Palustrine forested wetlands in the Oneida Project Boundary are in the broad-leaved deciduous subclass and are either seasonally or temporarily flooded. Narrowleaf cottonwood (*Populus angustifolia*) is a common tree species in the forested wetlands in the Oneida Project Boundary (PacifiCorp, 1999). Willow species (*Salix* spp.) are also associated with palustrine forest habitat along with bird species like Bullock's oriole (*Icterus bullockii*) and yellow warblers (*Setophaga petechia*). There are 18.3 acres of palustrine forested wetlands within the Oneida Project Boundary and an additional 0.1 acre within 100 meters of the boundary.

4.6.4 Palustrine Scrub-Shrub

Palustrine scrub-shrub wetlands are dominated by woody plants less than 6 meters tall. Shrubs include tree shrubs, which are young trees that have not reached 6 meters in height along with other trees and woody plants that are stunted because of adverse environmental conditions. Common shrubs in this habitat include red-osier dogwood (*Cornus sericea*), thinleaf alder (*Alnus incana*), and various willow species (*Salix spp.*). Scrub-dominated riparian zones support a wide

diversity of wildlife and provide key habitat for migratory birds. There are 9.1 acres of palustrine scrub-shrub wetlands within the Oneida Project Boundary and an additional 6.9 acres within 100 meters of the boundary.

4.6.5 Palustrine Unconsolidated Bottom

Palustrine unconsolidated bottom wetlands are not widespread within and around the Oneida Development. There are 0.9 acres of palustrine unconsolidated bottom wetlands within 100 meters of the Oneida Project Boundary. There are no palustrine unconsolidated bottom wetlands inside the Oneida Project Boundary.

4.6.6 Riverine Lower Perennial Unconsolidated Bottom

Riverine lower perennial unconsolidated bottom wetlands are characterized by a low gradient. There are no riverine lower perennial unconsolidated bottom wetlands within the Oneida Project Boundary. However, there are 2.4 acres of the wetland class within 100 meters of the Oneida Project Boundary that have been excavated by humans.

4.6.7 Riverine Upper Perennial Unconsolidated Bottom

Riverine upper perennial systems are characterized by a high gradient. Water is typically highly oxygenated and flows all year, except in cases of extreme drought. Unconsolidated bottoms are characterized by a lack of stable surfaces for plants and animals to attach to and organisms found in the area are adapted to running water. In total, there are 1,335.9 acres of riverine upper perennial unconsolidated bottom wetlands within the Oneida Project Boundary.

4.6.8 Riverine Intermittent Streambed

Riverine intermittent streambed wetlands are typically narrow, linear channels that only contain flowing water for part of the year. These include intermittent streams draining into the reservoir and river. Because these wetlands are both narrow and ephemeral, they tend to support similar plant and wildlife species to adjacent habitats. There are 47.2 acres of riverine intermittent streambed wetlands within the Oneida Project Boundary and an additional 7 acres within 100 meters of the boundary.

4.6.9 Invasive Species

Species found in the Oneida Project Boundary that thrive in hydric soils and are listed as noxious weeds by the State of Idaho include Canada thistle (*Cirsium arvense*), hoary cress (*Cardaria draba*), musk thistle (*Carduus nutans*), perennial pepperweed (*Lepidium latifolium*), and poison hemlock (*Conium maculatum*) (Cirrus, 2008). PacifiCorp's weed control program focuses on the accessible portions of their land near the Oneida Development facilities and roads with pesticide spraying during the spring and summer (Cirrus, 2011).

4.6.10 Existing Protection, Mitigation, and Enhancement Measures

The protection, mitigation, and enhancement measures for wetlands, riparian, and littoral habitat outlined in PacifiCorp's 1999 Bear River Project License Application have been implemented since FERC license issuance. Additionally, the 2011 Land Management Plan and Buffer Zones

report outlines wetland and riparian habitat management along with vegetation management that include noxious weed control in riparian areas (Cirrus, 2011).

4.7 RARE, THREATENED, AND ENDANGERED SPECIES

4.7.1 Federally Listed Species

As the federal agency with licensing authority over the Bear River Project, FERC is subject to the provisions of Endangered Species Act (ESA) Section 7, which requires federal agencies to consult with the USFWS and National Marine Fisheries Service to ensure that actions they fund, authorize, permit, or otherwise carry out will not jeopardize the continued existence of any federally listed species or adversely modify designated critical habitats.

As previously noted, the Bear River terminates in the Great Salt Lake in Utah and is considered a closed basin. Accordingly, this section focuses on species protected by the USFWS.

The IPaC assessment (USFWS, 2023) identifies three listed, proposed, or candidate species under the ESA to be addressed for the proposed Oneida Pumped Storage Facility (Table 4.7-1). These include the North American wolverine (*Gulo gulo luscus*, proposed threatened), the monarch butterfly (*Danaus plexippus*, candidate), and the Ute Ladies'-tresses (*Spiranthes diluvialis*, threatened). Wolverine is not likely to use the area around the proposed Oneida Oneida Pumped Storage Facility area due to the absence of suitable habitat; however, there have been multiple observations of wolverines in Franklin County (IDFG, 2023b). The monarch butterfly, and its host milkweed (*Asclepias* spp.) plant, and Ute Ladies'-tresses may also occur in the area around the proposed Oneida Pumped Storage Facility. These species are discussed below and their occurrence in the area near the proposed Oneida Pumped Storage Facility is summarized in Table 4.7-1.

Table 4.7-1. Rare, threatened, or endangered species with potential to occur in the Project area as identified by the IPaC tool.

Species Name	Federal Designation	Observations Near Project[a]	Habitat Found Near Project[b]	Project Threats	Field Surveys
Monarch Butterfly (*Danaus plexippus*)	Candidate	Yes	Yes	Habitat loss, application of herbicides and pesticides.	Yes
North American wolverine (*Gulo gulo luscus*)	Proposed, Threatened	No	No	None	No, due to lack of suitable habitat
Ute Ladies'-tresses (*Spiranthes diluvialis*)	Threatened	No	Yes	Habitat alteration (water regime), herbicide application.	Yes

Source: USFWS (2023)

[a] IDFG (2023)

[b] Based on habitat found within 0.25 miles of the Project Boundary

Monarch Butterfly

Monarch butterflies have distinct winter and summer habitat needs. They are present in Idaho during the summer, when they forage on nectar-producing flowers wherever they are available, including fields, meadows, and urban plantings. Milkweed is required for reproduction because eggs are only placed on milkweed plants throughout the butterfly's breeding range. The primary threats to the monarch butterfly's biological status include loss of critical wintering habitat in Mexico and coastal California, loss of milkweed due to habitat conversion, and the application of herbicides and pesticides (NatureServe, 2023).

After a thorough review of the best available scientific and commercial information, USFWS found that listing the monarch butterfly as an endangered or threatened species is warranted but precluded by higher priority actions, thus maintaining the butterfly's status as a candidate species (USFWS, 2020).

The IDFG Species Observation database (IDFG, 2023b) has multiple monarch butterfly observations around the Project. While the presence of milkweed is necessary as breeding habitat, this species travels great distances to reach suitable habitat and could potentially be found in a variety of habitat types within and around the Project.

USFWS prepared a special status assessment for the monarch butterfly in 2020 (USFWS, 2020). There is no recovery plan for the monarch butterfly and only one Biological Opinion for the species (USFWS, 2020).

North American Wolverine

The North American wolverine is a medium-sized carnivore found in the west-northwestern United States, Alaska, and Canada. Due to the difficulties of monitoring wolverine, systematic monitoring and occupancy surveys have not been performed across the entirety of its range. Wolverines are a transient species, occupying a variety of habitats. Generally, they select areas far from human development with deep, persistent snowpack through May and physical/structural features such as talus slopes and rugged terrain. Wolverines are highly mobile and have large territories with low population densities.

In 2013, USFWS proposed listing the North American wolverine as threatened (78 FR 7864; February 4, 2013). The USFWS will make a final listing determination by the end of November 2023. The IPaC tool found the North American wolverine to be potentially impacted by the Project, and there have been multiple wolverine observations within 10 miles of the Project area over the last decade. While the current USFWS Species Status Assessment for the North American wolverine (USFWS, 2018) says the Oneida Development falls outside the current potential extent of occurrence, the Species Status Assessment is in the process of being updated to help inform the final listing determination. Project impacts on the North American wolverine appear to be unlikely due to lack of habitat and proximity to human development.

Ute Ladies'-tresses Orchid

USFWS lists Ute ladies'-tresses as endangered. There is no designated critical habitat for this species. Ute ladies'-tresses is endemic to moist soils in mesic or wet meadows near springs,

lakes, and perennial streams. The elevation range of known habitat is 700 to 7,000 feet. Most occurrences are along riparian edges, gravel bars, old oxbows, and moist to wet meadows along perennial streams and rivers, although some are near freshwater lakes or springs (USFWS, 1995).

Ute ladies'-tresses appears to be well adapted to disturbances caused by water movement through floodplains over time. The species occurs in areas where the vegetation is relatively open and not very dense, and in wet meadow habitats with dense vegetation. It often grows on point bars and other recently created riparian habitat. The orchid appears to require permanent sub-irrigation, with the water table holding steady throughout the growing season and into late summer and early autumn. This species is considered a general riparian species (USFWS, 1995). There is no species status assessment for the Ute ladies'-tresses, but a draft recovery plan is being implemented (USFWS, 1995).

4.7.2 Bald and Golden Eagle

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act of 1940 (16 USC 668–668d), which prohibits any person or organization without a permit from "taking" bald or golden eagles. Disturbing eagles is considered as "take" under the Act, and regulations further define "disturb" as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" (50 CFR 22.6).

Bald eagles have historically nested in the "Old Camp" at the Oneida Development, and the USFWS's IPaC website (USFWS, 2023) showed that golden eagles have the potential to use the Project area for hunting or nesting. There have been multiple observations of bald and golden eagles in and near the Project (IDFG, 2023b).

Table 4.7-2. Eagles with potential to occur near the Project.

Species Name	Observations Near Project Area[b]	Habitat Found in Project Area[c]	Project Threats	Field Surveys
Bald Eagle (*Haliaeetus leucocephalus*)	Yes	Yes	Susceptible to disturbance during nesting. Habitat loss, loss of prey items.	Yes
Golden Eagle (*Aquila chrysaetos*)	Yes	Yes	Susceptible to disturbance during nesting. Habitat loss, loss of prey items.	Yes

* Indicates species additionally listed as Bird of Conservation Concern
[a] IDFG (2023)
[b] Based on habitat found within 0.25 miles of the Project Boundary

4.7.3 Rare Species

The IDFG designates several wildlife species as Species of Greatest Conservation Concern (SGCN) to implement wildlife management and habitat restoration for species to preclude them being listed as threatened or endangered under the ESA. The 2015 Idaho State Wildlife Action Plan (SWAP; IDFG, 2017) identifies Tier 1 SGCN as the "highest priority for the SWAP and to represent species with the most critical conservation needs, i.e., an early-warning list of taxa that may be heading toward extirpation." Tier 2 SGCN are identified as "secondary in priority and represent species with high conservation needs—that is, species with longer-term vulnerabilities or patterns suggesting management intervention is needed but not necessarily facing imminent extinction or having the highest management profile." Several Tier 1 and Tier 2 SGCN have been identified as potentially occurring in the proposed Oneida Pumped Storage Facility area.

The greater sage-grouse (*Centrocercus urophasianus*) is identified as a Tier 2 SGCN, but habitat mapping by the BLM shows that the proposed Oneida Pumped Storage Facility does not fall into a sage-grouse Habitat Management Area, meaning that the area is unlikely to support sage-grouse and that no sage-grouse-specific restrictions apply to the area (BLM, 2015). Additionally, there are no known leks or species observations of the greater sage-grouse within and around the proposed Oneida Pumped Storage Facility .

Similarly, pygmy rabbit (*Brachylagus idahoensis*) and burrowing owl are identified as Tier 2 SGCN, but there have been no observations of either species in the vicinity of the proposed Oneida Pumped Storage Facility.

The USFWS also identifies several avian species as Birds of Conservation Concern (BCC). These species are most likely to become candidates for listing under the ESA, representing the highest conservation priority for USFWS. The list is based on population abundance and trends, threats to habitat, and the size of the population range. Several BCC are identified as potentially occurring within and around the proposed Oneida Pumped Storage Facility.

Table 4.7-3 identifies rare SGCN and BCC that that have habitat within and around the proposed Oneida Pumped Storage Facility.

Table 4.7-3. Species of Greatest Conservation Need with potential to occur within and around the proposed Oneida Pumped Storage Facility, as identified by the 2015 Idaho State Wildlife Action Plan.

Species Name	SGCN Rank*	Observations Near Project[b]	Habitat Found Near Project[c]	Potential Project Impacts	Field Surveys
Mammals					
Silver-haired Bat (*Lasionycteris noctivagan*s)	Tier 2	No	Yes	Habitat loss from construction, construction noise near roost sites in summer (neither bat species uses the area	No, due to preservation of bat roosting houses in "Old Camp"—see section 4.7.4.

Species Name	SGCN Rank*	Observations Near Project[b]	Habitat Found Near Project[c]	Potential Project Impacts	Field Surveys
				for winter hibernation).	
Birds					
American Bittern (*Botaurus lentiginosus*)	Tier 2	Yes	Yes	Habitat loss, increased sediment into habitat areas, construction noise during breeding season, invasive species spread through ground disturbance.	Yes
American White Pelican (*Pelecanus erythrorhynchos*)	Tier 2*	Yes	Yes	Habitat loss, increased sediment into habitat areas, construction noise during breeding season, invasive species spread through ground disturbance.	Yes
Black Tern (*Chlidonias niger*)	Tier 2	No	Yes	Habitat loss, increased sediment into habitat areas, construction noise during breeding season, invasive species spread through ground disturbance.	Yes
Bobolink (*Dolichonyx oryzivorus*)	Tier 2	No	Yes	Habitat loss, construction noise during breeding season.	Yes
California Gull (*Larus californicus*)	Tier 2* Breeding population only	Yes	Yes	Habitat loss, increased sediment into habitat areas, construction noise during breeding season, invasive species spread through ground disturbance.	Yes
Caspian Tern (*Hydroprogne caspia*)	Tier 2 Breeding Population Only	No	Yes	Habitat loss, increased sediment into habitat areas, construction noise during breeding season, invasive species spread through ground disturbance.	Yes

Species Name	SGCN Rank*	Observations Near Project[b]	Habitat Found Near Project[c]	Potential Project Impacts	Field Surveys
Cassin's Finch (*Haemorhous cassinii*)	N/A*	Yes	Yes	Habitat loss, construction noise during breeding season.	Yes
Clark's Grebe (*Aechmophorus clarkii*)	Tier 2*	Yes	Yes	Habitat loss, increased sediment into habitat areas, construction noise during breeding season, invasive species spread through ground disturbance.	Yes
Common Loon (*Gavia immer*)	Tier 2	Yes	Yes – Spring and Fall only	None	No, due to lack of presence during breeding season.
Evening Grosbeak (*Coccothraustes vespertinus*)	N/A*	No	Yes	Habitat loss, construction noise during breeding season.	Yes
Ferruginous Hawk *(Buteo regalis*)	Tier 2	No	Yes	Very susceptible to disturbance during nesting. Habitat loss, loss of prey items (small mammals).	Yes
Franklin's Gull (*Leucophaeus pipixcan*)	Tier 3*	Yes	Yes	Habitat loss, increased sediment into habitat areas, construction noise during breeding season, invasive species spread through ground disturbance.	Yes
Lewis's Woodpecker *(Melanerpes lewis*)	Tier 2	No	Yes	Habitat loss, loss of snags and cavity trees, construction noise during breeding season.	Yes
Long-billed Curlew *(Numenius americanus*)	Tier 2	No	Yes	Habitat loss, construction noise during breeding season.	Yes

Species Name	SGCN Rank*	Observations Near Project[b]	Habitat Found Near Project[c]	Potential Project Impacts	Field Surveys
Pinyon Jay *(Gymnorhinus cyanocephalus*)	Tier 2	No	Yes	Habitat loss, construction noise during breeding season.	Yes
Rufous Hummingbird (*Selasphorus rufus*)	N/A*	No	Yes	Habitat loss, construction noise during breeding season.	Yes
Sage Thrasher *(Oreoscoptes montanus*)	Tier 2	No	Yes	Habitat loss, construction noise during breeding season.	Yes
Sharp-tailed Grouse *(Tympanuchus phasianellus*)	Tier 2	Yes	Yes	Susceptible to disturbance at lek or nest; habitat loss; predation from ravens, raccoons, coyotes.	Yes
Trumpeter Swan *(Cygnus buccinator*)	Tier 2	Yes	Yes	Habitat loss, construction noise during breeding season.	Yes
Western Grebe (*Aechmophorus occidentalis*)	Tier 2*	Yes	Yes	Habitat loss, increased sediment into habitat areas, construction noise during breeding season, invasive species spread through ground disturbance.	Yes
White-faced Ibis *(Plegadis chihi*)	Tier 2	Yes	Yes	Habitat loss, increased sediment into habitat areas, construction noise during breeding season, invasive species spread through ground disturbance.	Yes
Willet (*Tringa semipalmata*)	N/A*	No	Yes	Habitat loss, construction noise during breeding season.	Yes

Species Name	SGCN Rank*	Observations Near Project[b]	Habitat Found Near Project[c]	Potential Project Impacts	Field Surveys
Amphibians					
Western Toad (*Anaxyrus boreas*)	Tier 2	No	Yes	Habitat loss, increased sediments and toxins in habitat.	Yes
Northern Leopard Frog (*Lithobates pipiens*)	Tier 2	Yes	Yes	Habitat loss, increased sediments and toxins in habitat.	Yes
Invertebrates					
Bear Lake Springsnail (*Pyrgulopsis pilsbryana*)	Tier 1	Yes	Yes	Habitat loss, water diversion, sedimentation, water quality changes, heavy grazing.	Yes
Rocky Mountain Duskysnail (*Colligyrus greggi*)	Tier 2	Yes	Yes	Habitat loss, water diversion, sedimentation, water quality changes, heavy grazing, increasing water temperatures.	Yes
Western Pearlshell (*Margaritifera falcata*)	Tier 2	Yes	Yes	Habitat loss, water diversion, sedimentation, water quality changes, water level fluctuation.	Yes
Morrison's Bumble Bee (*Bombus morrisoni*)	Tier 1	Unknown	Yes	Pesticide use, habitat loss.	Yes
Suckley's Cuckoo Bumble Bee (*Bombus suckleyi*)	Tier 1	Unknown	Yes	Pesticide use, habitat loss.	Yes
Western Bumble Bee (*Bombus occidentalis*)	Tier 1	Unknown	Yes	Pesticide use, habitat loss.	Yes

Source: IDFG (2017)

* Indicates species additionally listed as Bird of Conservation Concern

[a] IDFG (2023)

[b] Based on habitat found within 0.25 miles of the Oneida Project Boundary

4.7.4 BLM Special Status Plant Species

The BLM Special Status Plant Species policy intends to conserve and/or recover ESA-listed species and the ecosystems on which they depend so that ESA protections are no longer needed for these species (BLM Special Status Species Management Policy 8640). It also provides for proactive conservation measures that reduce or eliminate threats to BLM sensitive species to minimize the likelihood of and need for listing of these species under the ESA. BLM Idaho Special Status Plants include plant taxa that are:

- BLM Type 1 – Federally listed as Threatened or Endangered.
- BLM Type 2 – Rangewide/Globally Imperiled Species/High Endangerment. These are species that have a high likelihood of being listed in the foreseeable future due to their global rarity and significant endangerment factors. Species also include Proposed and Candidate species for federal listing, previously federally listed species delisted during the past 5 years, ESA Experimental Non-essential species, and ESA Proposed Critical Habitat.
- BLM Type 3 – Range-wide or State-wide Imperiled/Moderate Endangerment. These are species that are globally rare or very rare in Idaho, with moderate endangerment factors. Their global or state rarity and the inherent risks associated with rarity make them imperiled species.
- BLM Type 4 – Species of Concern. These are species generally rare in Idaho with small populations or localized distribution that currently have low threat levels. However, due to the small populations and habitat area, certain future land uses in close proximity could significantly jeopardize these species.

The Pocatello Field Office Special Status Plant Species list includes 21 species. A desktop analysis of these species was conducted for the proposed Oneida Pumped Storage Facility. Of the 21 species, 6 species may have potential habitat near Project. These species are listed in Table 4.7-4.

4.7.5 Existing Protection, Mitigation, and Enhancement Measures

The “Old Camp” location of the Oneida Plant Parcel contains an abandoned residential area west of the existing powerhouse. Two abandoned homes south of the property have been left standing and have been colonized by bat species. The structures are currently secured by a fence to prevent public access and protect the bat colonies. A third, purpose-built bat roosting structure was constructed in 2019 to provide additional habitat. These structures host thousands of bats during the summer, including little brown myotis, silver-haired bats, and Yuma myotis. These structures will not be impacted by Project construction and operation.

Game species (e.g., sage-grouse and sharp-tailed grouse) are protected by IDFG hunting regulations that specify seasons, bag limits, and other restrictions.

Table 4.7-4. BLM Special Status Plant Species potentially occurring near the Project.

Species Name	State Rank	Habitat Found in Project Area[c]	Habitat Requirements[d]	Potential Project Impacts	Mitigation Measures if Present
Cooper's rubber-plant (*Hymenoxys cooperi var. canescens*)	S1	Yes	Open areas, edges of juniper/pine forest, and on roadsides at elevations ranging from 1,000 to 3,500 meters	Construction and operation.	Avoid occupied habitat
Prostrate Bladder pod (*Lesquerella prostrata*)	S2	Yes	Plains, hills, and slopes in sagebrush, grass, and juniper communities, mainly on calcareous substrates, but it can also occur on igneous substrates, 5900-8200 feet	Construction and operation	Avoid occupied habitat
Holmgren's owl clover (*Orthocarpus holmgreniorum*)	S1	Yes	Sagebrush meadows and slopes with shallow, rocky, clay soils	Construction and operation	Avoid occupied habitat
Green needle grass (*Nassella viridula*)	S2	Yes	Open woods and grasslands, usually on sandy soils	Construction and operation	Avoid occupied habitat
Clustered goldenweed (*Pyrrocoma racemosa var. spaniculata*)	S1	Yes	Open fields, meadows with alkaline soil, and near boggy places and hot springs, at elevations ranging from 100 to 2,500 meters	Construction and operation	Avoid occupied habitat
Silky bladderpod (*Cryptantha sericea*)	SNR	Yes	Open pine-juniper woodlands and fir-mountain brush communities, in sandy to gravelly soils, shaley slopes and sandstone outcrops	Construction and operation	Avoid occupied habitat

4.8 RECREATION AND LAND USE

4.8.1 Regional Recreational Resources

Outdoor recreation is an important economic and social aspect of life in Fremont County and in Idaho as a whole. The Idaho Statewide Comprehensive Outdoor Recreation Plan (SCORP; Idaho Department of Parks and Recreation, 2018) states that "79 percent of Idaho residents participate in outdoor recreation, ranking the state third behind Alaska and Montana [nationally]".

Economically, outdoor recreation generates $7.8 billion in annual consumer spending statewide (see section 4.12, *Socioeconomic Resources*; Idaho Department of Parks and Recreation, 2018). The current Idaho SCORP identifies that more hiking trails, mountain biking trails, and multi-use trails (both paved and unpaved, motorized and unmotorized) are needed, as current supply exceeds the demand (Idaho Department of Parks and Recreation, 2018).

Recreational use of natural resources in Franklin and Caribou counties is growing steadily in response to the overall population growth experienced in southeastern Idaho and adjacent areas in Utah. Popular recreation areas near the Project include Bear Lake, Lava Hot Springs, and Blackfoot Reservoir. Public lands managed by the USFS and BLM provide opportunities for hunting, fishing, camping, hiking, skiing, snowmobiling, and numerous other outdoor activities in the area.

4.8.2 Oneida Development Recreation Facilities

The Oneida Development includes six recreation facilities in the Oneida Project Boundary (Figure 4.8-1) including one privately owned commercial recreation facility, two campground facilities managed by the BLM, and three facilities operated by PacifiCorp. A description of each facility follows.

Maple Grove Hot Springs and Retreat Center. This 45-acre, privately owned and operated recreation center is located on the east bank of the Bear River approximately 3.5 river miles upstream of Oneida Dam. Natural mineral hot springs discharge on the property into an upper and lower pool that are diverted into four soaking pools for guests. It is open year-round to the public from 10 a.m.–9 p.m. daily and closes each Wednesday for cleaning and maintenance. Private lodging can be reserved at stone shelters, yurts, a cabin, or designated campsites. A boat dock for canoes and small non-motorized watercraft provides access to the Oneida Reservoir near the middle of the property. This facility is the only private property within the boundary of Oneida Development and is not attached to the current Bear River Project license.

Maple Grove Campground. Maple Grove Campground is located on the southeastern shoreline of Oneida Reservoir on BLM land approximately 1 mile upstream from Oneida Dam (Figure 4.8-2; BLM, 2004). This campground is managed by the BLM and consists of 13 campsites, each with the capacity to hold two vehicles and up to 20 people. Each campsite has a picnic table, fire pit, and grill. There are two vault toilet buildings. The vault toilets and two of the campsites are ADA-accessible. The Maple Grove Campground also has a small day-use area with a boat ramp, floating dock, and gravel parking area for approximately four vehicles. There is a $5 per night user fee at this site.

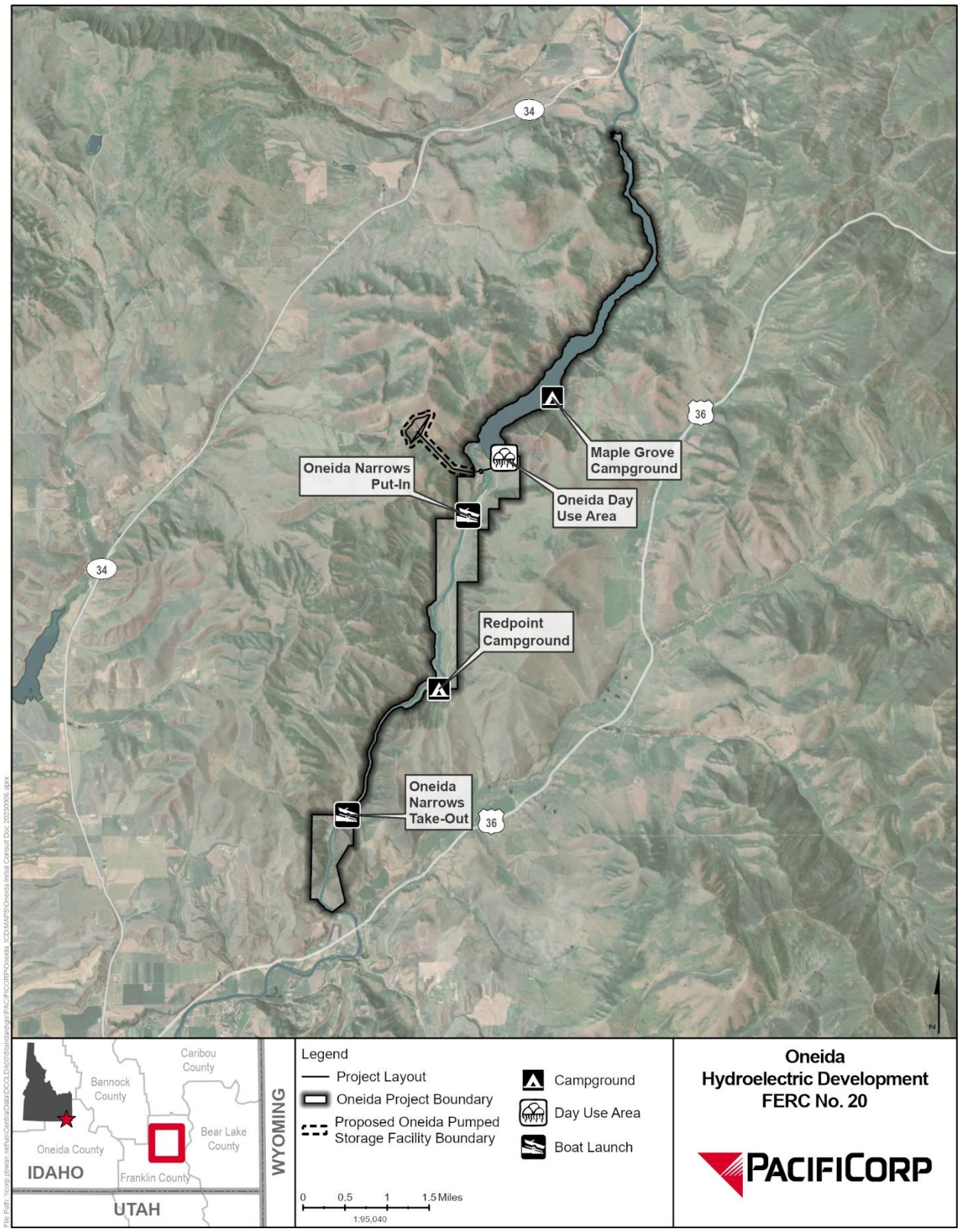


Figure 4.8-1. Project-related recreation facilities in the Oneida Project Boundary.

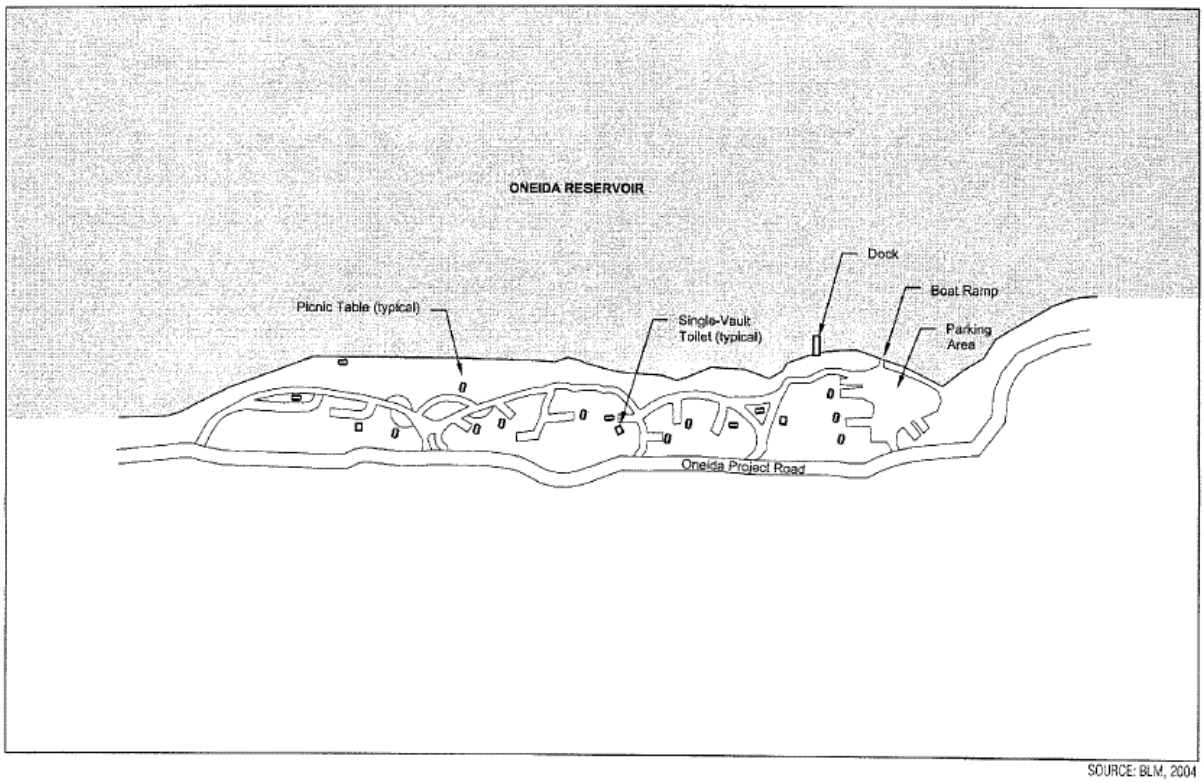


Figure 4.8-2. Site plan of the Maple Grove Campground.

Oneida Day-Use Area. This PacifiCorp-owned facility is located on the southeastern shoreline of Oneida Reservoir, immediately upstream of Oneida Dam (Figure 4.8-3, EDAW Inc., 2004). The site consists of a boat ramp, floating dock, 10 picnic sites (each site with a picnic table, grill, and fire pit), a vault toilet building, and parking for approximately 20 vehicles.

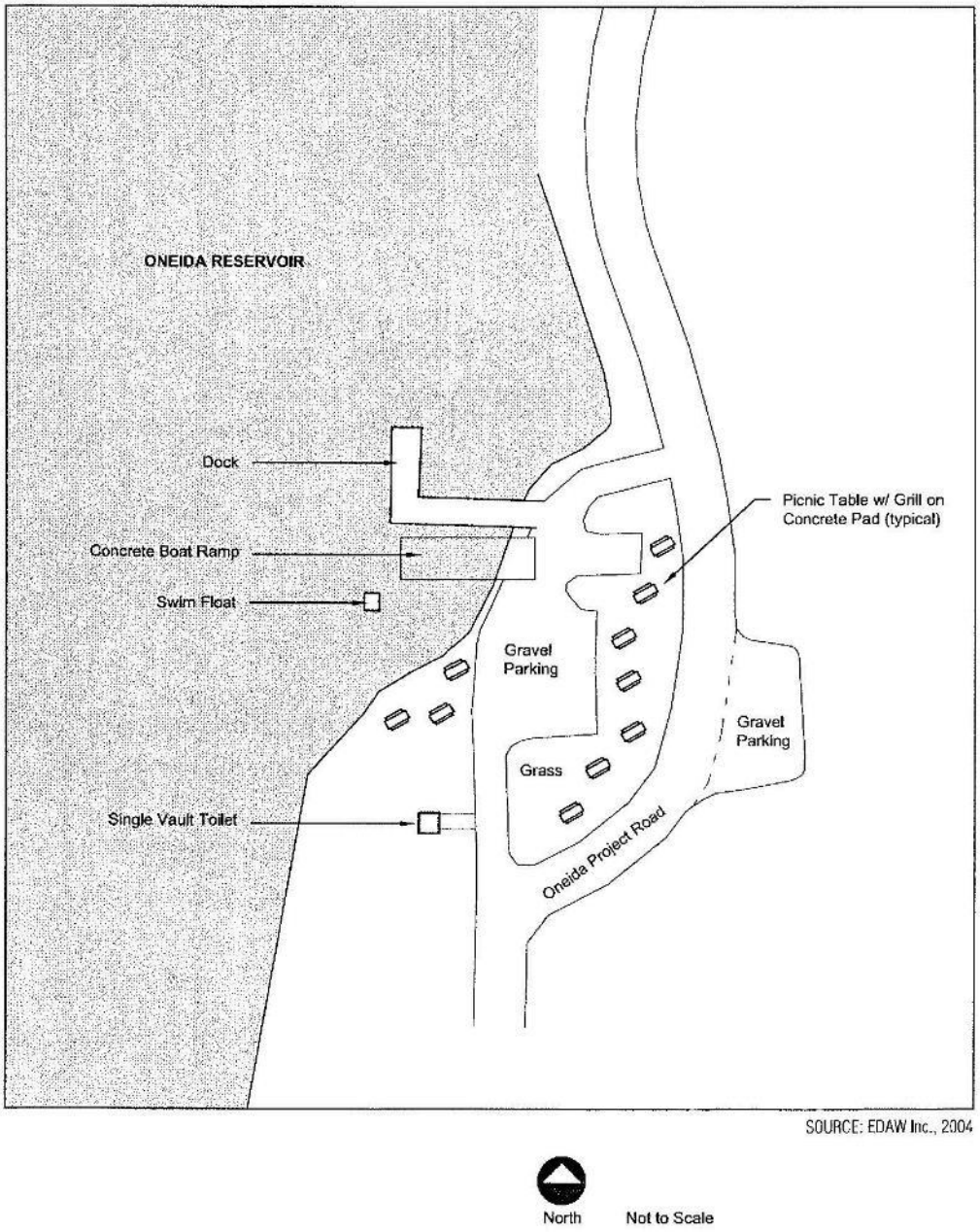


Figure 4.8-3. Site plan of the Oneida Day Use Area.

Redpoint Campground. Redpoint Campground is located along the Bear River approximately 2 miles downstream of Oneida Dam (Figure 4.8-4; BLM, 2004). The Redpoint Campground is mostly on BLM lands but also includes PacifiCorp land. BLM manages this campground. The site consists of 10 primitive campsites, several picnic tables, and a vault toilet building.

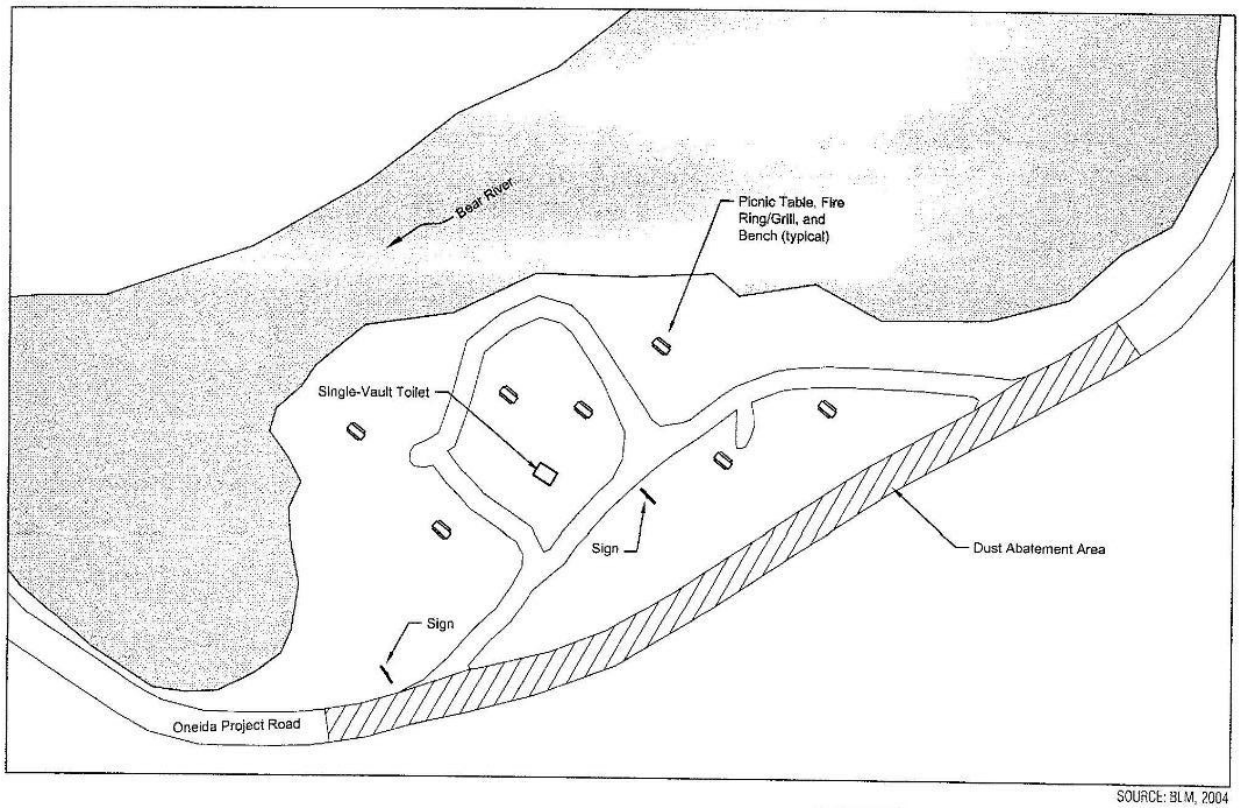


Figure 4.8-4. Site plan of the Redpoint Campground.

Oneida Narrows Put-In. The Oneida Narrows Put-In is located on PacifiCorp land downstream from the Oneida Dam along Oneida Project Road (Figure 4.8-5; PacifiCorp, 2004). The site consists of a hand-launch boat ramp, a gravel parking area for approximately 10 vehicles, and a portable restroom. PacifiCorp is responsible for the ongoing operation and maintenance of this site.

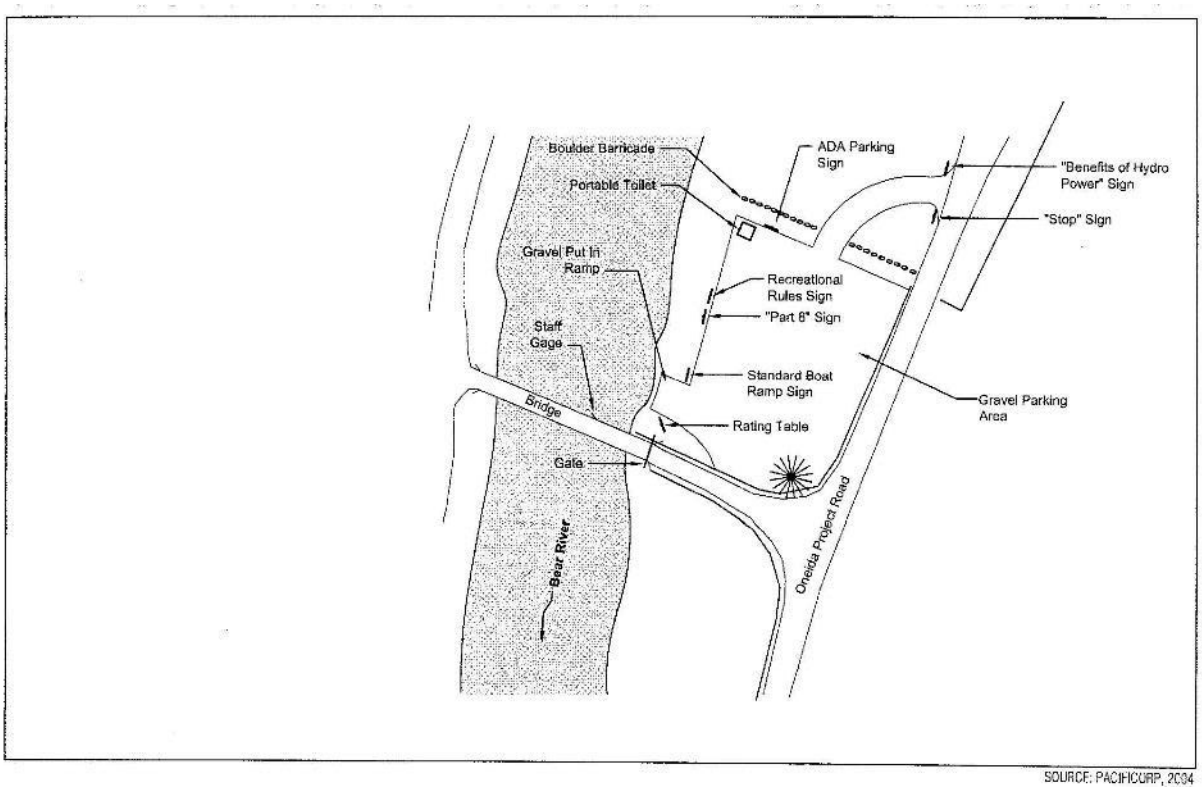


Figure 4.8-5. Site plan of the Oneida Narrows Put-In.

Oneida Narrow Take-Out. The Oneida Narrows Take-Out is located downstream of Redpoint Campground along Oneida Project Road (Figure 4.8-6; PacifiCorp, 2004). The site consists of a hand-launch boat ramp, a portable restroom, and parking for approximately 10 vehicles along the side of the road. PacifiCorp is responsible for ongoing operation and maintenance of this site, which is located on BLM-managed land.

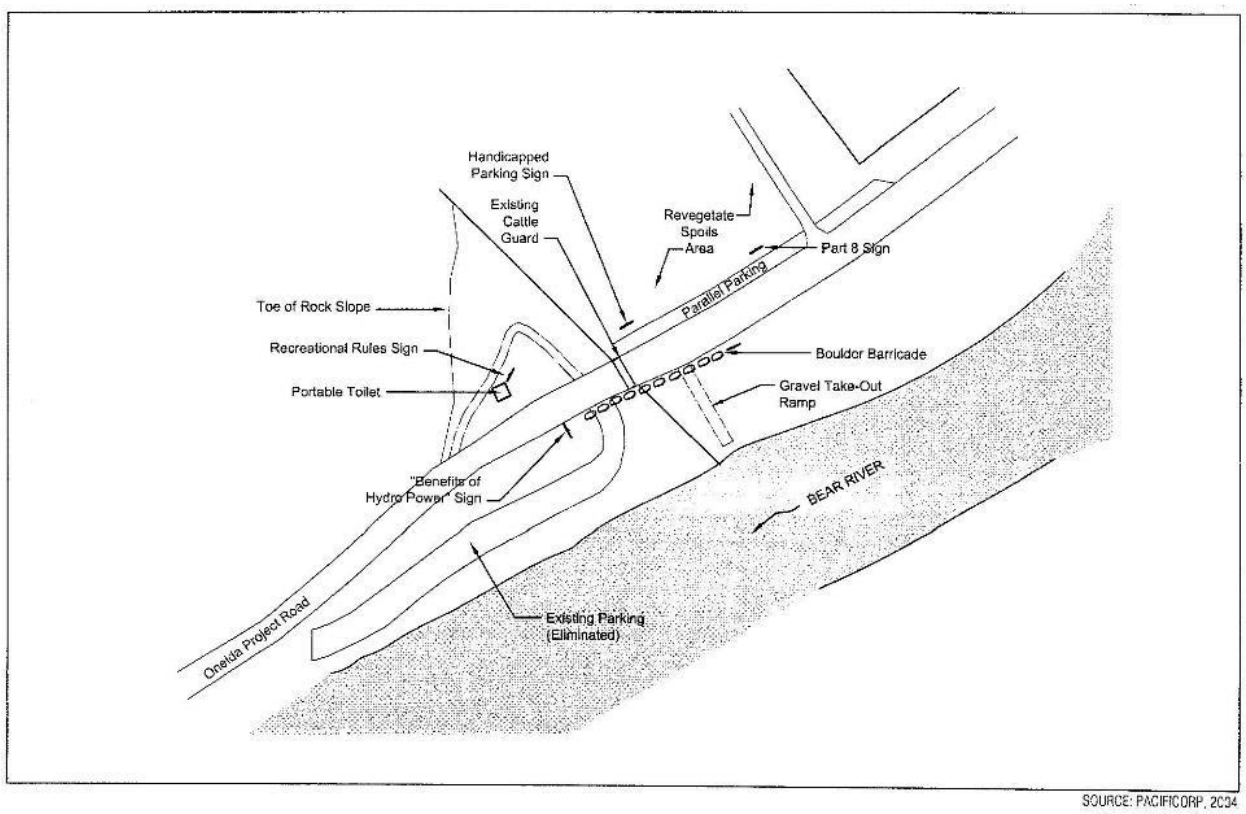


Figure 4.8-6. Site plan of the Oneida Narrows Take-Out.

4.8.3 Oneida Development Recreation Use

The Oneida Development is a popular recreation location. Anecdotal evidence indicates that recreational demand may exceed capacity during peak times (e.g., weekends and holidays).

The following recreational uses occur at the Oneida Develop and Bear River Project at-large. (Cirrus, 2015):

- Overnight Camping – overnight camping is allowed at designated campgrounds (Maple Grove and Redpoint campgrounds). Dispersed camping is prohibited.
- Recreational Boating – Motorized watercraft are used on Oneida Reservoir and on the Bear River upstream. Non-motorized watercraft are used on the Bear River downstream of the reservoir. Access to the river is allowed only at existing developed river access sites (e.g., Oneida Narrows Put-In, Oneida Narrows Take-Out, designated campgrounds, and the Oneida Day-Use Area).
- OHV Use – OHV use in the Bear River Project area is permitted on designated roads.
- Fishing and hunting – allowed on all PacifiCorp lands following IDFG regulations.
- General – picnicking, swimming, floating, bicycling, and wildlife observation.

Overnight camping occurs at the Oneida Development at campgrounds managed by the BLM. Although prohibited, some dispersed camping occurs in riparian areas along the Bear River. Impacts on vegetation, water quality, and other resources result from this activity. Management efforts to eliminate dispersed camping include regular inspection, boundary fencing, barriers, and signage.

Use of Oneida Reservoir and the Bear River for boating and floating activities is steadily increasing, due in part to competition for access to other water bodies in the region. Availability of equipment has likely contributed to increased use. Private vendors renting float tubes and other inflatable watercraft are found at the turnoff to Oneida Narrows and other nearby locations.

PacifiCorp enhances whitewater boating opportunities at the Bear River Project by providing for and/or enhancing identified recreation facilities used by whitewater boaters, operating and maintaining these facilities and access sites, and providing for flow releases that allow for whitewater boating, consistent with the availability of flows and other considerations defined by current license (see PacifiCorp's Black Canyon Monitoring Plan, License Article 407).

Use of OHVs for travel on designated roads is a popular activity in the near the Oneida Develop and Project. Off-road impacts from this use are mainly associated with dispersed camping.

Fishing is popular at the reservoir and the Bear River at boat launch facilities, along the shoreline, from watercraft, and by wading in shallow areas. Game fish in the reservoir include walleye, smallmouth bass, and perch. Dominant games species in the Bear River downstream of Oneida Reservoir include rainbow trout, smallmouth bass, and mountain whitefish. A detailed discussion of fish species, habitat, and fish stocking is included in section 4.4, *Fish and Aquatic Resources*.

Hunting occurs on land in and surrounding the Oneida Development. Guided hunts are offered on land adjacent to the west side of the development for big-game species such as deer and elk. The development is in Game Management Unit 77 and the Bear River Elk Management Zone. Harvest statistics from this unit indicate that most hunting activity in the Oneida area targets mule deer and upland bird species. Hunters on PacifiCorp land can harvest deer, elk, pheasant, wild turkey, sharp-tailed grouse, and waterfowl. A detailed discussion of wildlife habitats and species in the development area is included in section 4.5, *Wildlife and Botanical Resources*.

4.8.4 Shoreline Management Policy and Shoreline Buffer Zones

License Article 425 requires protection of riparian areas within the Project Boundary. PacifiCorp has fenced the outside perimeter boundary on its property and removed interior fencing. Grazing has been eliminated on all PacifiCorp-owned lands, including those within the Oneida Project Boundary.

The Conservation Land management category (section 4.8.8 below) fulfills the "shoreline buffer" requirements of the license to protect other ecologically sensitive areas, particularly riparian zones, islands, and wetlands (Oneida Site Plan Update). Lands in this category are managed to retain and preserve undeveloped, natural open space, and to conserve and protect fish, wildlife, scenic, historic, archaeological, and cultural values. Motorized vehicle use is

prohibited except on designated roads. Dispersed camping is prohibited. Pedestrian trails are present and utilized by recreationists, particularly anglers.

The Conservation Land classification includes buffers around the Bear River and wetland riparian areas that adjoin the river. Delineation of Conservation Land was based on a number of factors including license requirements for riparian buffers, U.S. Army Corps of Engineers wetland criteria, and on-site assessment of sensitive habitats and potential impacts by PacifiCorp and contract biologists in 2005 and 2006. Buffer zone widths around protected areas vary depending on topography, land use, and other site-specific conditions.

Conservation Land occurs on all parcels in the Oneida Development. Note that lands previously designated as Agricultural Lease areas have been re-designated as Conservation Lands.

4.8.5 Wild and Scenic River

The National Wild and Scenic Rivers System was created by Congress in 1968 (Public Law 90-542; 16 USC 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. Idaho has approximately 107,651 miles of river, of which 891 miles are designated as wild and scenic. The Bear River in the Project area is not designated as a part of, or under study for inclusion in the National Wild and Scenic River System (National Wild and Scenic River System, 2023).

In 1994, BLM determined that a 2.4-mile section of the Bear River in Oneida Narrows Canyon downstream of the Oneida Development and outside the Project Boundary was eligible for inclusions in the Wild and Scenic Rivers program. BLM classified this reach as recreational because of outstandingly remarkable recreation, geologic, and wildlife values. For these lands to be classified under the Wild and Scenic Rivers Act, BLM will need to conduct a suitability study and make a recommendation to Congress. Until Congress acts to designate this section of the Bear River as part of the Wild and Scenic River System, the BLM will manage these lands under interim management prescriptions, which indicate that grazing, farming, water management and recreation are compatible with recreational river values.

4.8.6 Nationwide Rivers Inventory

The Nationwide Rivers Inventory (NRI) is a listing of more than 3,200 free-flowing river segments in the United States (NPS, 2022). These river segments are believed to possess one or more "outstandingly remarkable" natural or cultural values judged to be at least regionally significant. The Bear River within the Project Boundary is not listed on the National Rivers Inventory. Furthermore, there are no National Rivers Inventory segments upstream or downstream of the Oneida Development to the confluence with the Great Salt Lake.

4.8.7 National Trails System and Wilderness Areas

The NPS is responsible for maintaining designated national trails and wilderness areas. There are no national trails or wilderness areas in the proposed Oneida Pumped Storage Facility area.

4.8.8 State-Protected River Segments

As a component of the Comprehensive State Water Plan process, the Idaho Water Resources Board (IWRB) can designate river segments with outstanding fish and wildlife, recreational, aesthetic, or geologic value as a State-Protected River. If the IWRB determines that the values of preserving an outstanding waterway in its existing condition outweigh the values of continued development, it can, subject to legislative approval, designate that waterway either a Natural River or Recreational River to protect existing resources and use (IWRB, 2012). The Bear River at the Oneida Development is not designated in the State-Protected River Segments program.

4.8.9 Land Use and Land Cover

The land use categories at the Oneida Development, as designated by PacifiCorp for lands it owns, include Conservation Lands, Protected Operations Lands, and Developed Recreation Lands (Cirrus, 2015). Each land use category is described briefly below. PacifiCorp's Land Management and Buffer Zone Plans (Cirrus, 2011) provides further detail about these land uses, and associated standards for allowable uses.

Conservation Lands. The Conservation Land classification includes buffers around the Bear River and wetland riparian areas that adjoin the river. It protects ecologically sensitive areas, particularly riparian zones, islands, and wetlands. PacifiCorp has classified approximately 188 acres of its lands within the Oneida Project Boundary as Conservation Land, located on islands in the upper reaches of the reservoir and alongside the river downstream of the dam.

Project Operations Lands. The Project Operations Lands management category applies to acreage within the development boundary that is primarily used for electrical power generation, transmission, flow lines, maintenance yards, administrative offices, storage areas, and other associated facilities. Project Operations Lands are generally closed to public use for safety and security reasons. PacifiCorp has classified approximately 99 acres of its lands within the Oneida Project Boundary as Project Operations Lands.

Developed Recreation Lands. This land use classification applies to PacifiCorp land with established developed recreation facilities. Recreational use is encouraged but regulated to protect the full range of resource values and minimize environmental degradation. Motorized use is restricted to designated roads. Activities in this land use classification include launching boats, camping, fishing, picnicking, swimming, hiking, bicycling, and wildlife observation. PacifiCorp has classified approximately 6 acres of its lands within the Oneida Project Boundary as Developed Recreation Lands.

Land use in the Oneida Project Boundary and adjacent lands includes a mix of agriculture, hydropower generation, public recreation, and conservation. The National Land Cover Database (USGS, 2019) provides an overview of the land cover in the Project Boundary (Figure 4.8-7).

The upper reservoir of the proposed Oneida Pumped Storage Facility would be located on privately owned land. The lower reservoir and water conveyance (penstock) would be located on private and PacifiCorp-owned land. Lands adjacent to the Oneida Development are primarily BLM-administered public lands, PacifiCorp-owned lands, and lands held in other private ownership. Within a 1,000 foot buffer around the proposed upper reservoir and a 500-foot buffer around the

proposed penstocks the, the lands within and surrounding the proposed Oneida Pumped Storage Facility are held in private ownership other than PacifiCorp (61.6 percent), PacifiCorp (35.9 percent) and BLM (2.5 percent) (Table 3.9-1).

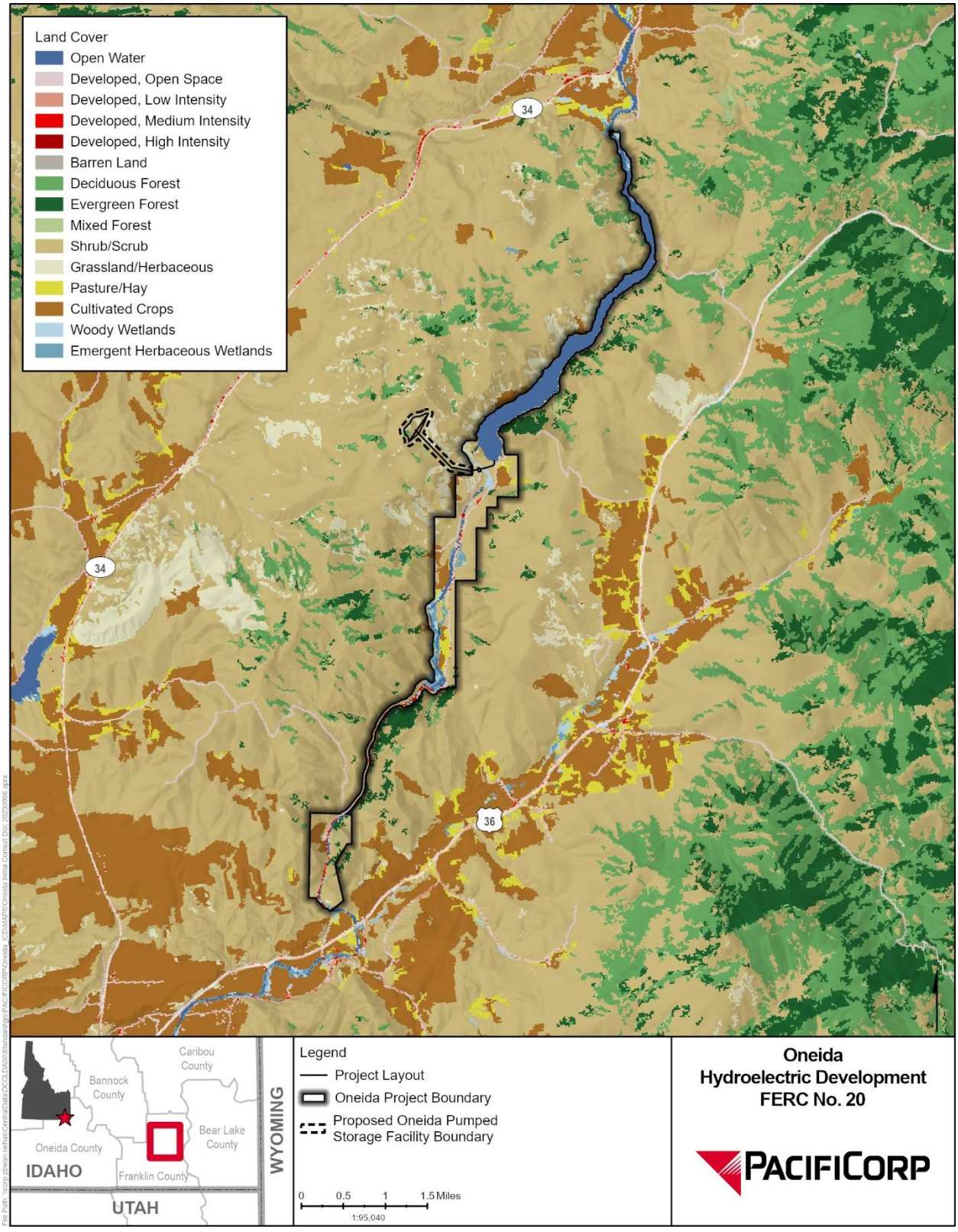


Figure 4.8-7. Land cover within and around the proposed Oneida Pumped Storage Facility and Oneida Project Boundary.

Grazing occurs on public and private lands immediately adjacent to the Project Boundary, and livestock has unimpeded access to the reservoir and Bear River downstream of Oneida Dam. PacifiCorp leases include language intended to maintain a shoreline buffer zone, stating that, "If Lessee uses the Premises for raising crops. Lessee must maintain at least a 20-foot-wide buffer strip of land within the Premises between the edge of the Lessee's field and the reservoir, river, or nearest body of water."

BLM and PacifiCorp manage contiguous conservation lands surrounding Oneida Reservoir on both sides of the Bear River. BLM designated a 617-acre tract in the Oneida Narrows as a Research Natural Area/Area of Critical Environmental Concern (RNA/ACEC) on the basis of the area's unusual plant communities and its outstanding geological formations. BLM goals for managing the RNA/ACECs include limiting human influences and setting aside the area so as to maintain its natural condition. Currently, PacifiCorp's primary access road, and the primary public access road, follows the river through these designated lands. PacifiCorp manages its land within the Bear River Project boundary pursuant to a Land Management Plan and shoreline buffer zone plan required by its license.

In 2011, PacifiCorp issued a revised Land Management Plan (LMP) for lands within the Project Boundary (PacifiCorp, 2011). The 2011 LMP superseded land designations established by the 2007 Oneida Site Plan (PacifiCorp, 2007). The primary change was to designate additional conservation lands in 2011 by converting lands formerly designated (in 2007) for Bear River Project operations or agricultural lease. Although the 2011 LMP changes management practices on these lands, the land cover characteristics have not changed significantly and are still dominated by agricultural species such as alfalfa and smooth brome (Ecosystem Sciences, 2011). Recovery of these areas to native grasslands will require a long period of time with consistent management as specified under the LMP. Therefore, no modifications to the 2009 land cover mapping results were necessary to accommodate the change in land management.

The 2022 Franklin County Comprehensive Plan sets forth a policy for Natural Resources "to maintain, protect and enhance the natural assets of the planning area. The county will direct development away from naturally hazardous sites or, where feasible, require site planning or construction techniques that mitigate the hazard." Franklin County (2022) specifies the following regulatory strategies that may be used to implement this policy:

A. Culinary or domestic water resources may be conserved by a county wide or development wide water distribution management system. Underground aquifers must be protected from depletion and contamination.

B. The county will use its development code to protect surface water resources. Stream corridor protection will be addressed in the development code. The county will adopt development code standards that require or encourage water quality protection, runoff and erosion control, wetlands protection, and development setbacks along stream beds and lake or reservoir shores.

C. The county will use its development code to direct development away from flood hazard areas and steep slopes. The code will also require or encourage development and construction techniques that mitigate such natural hazards as accelerated soil erosion, flooding, slope failure and wildfire.

D. Rural developments in Franklin County are vulnerable to destruction by wildfire. In these areas, the county will use its development code to encourage fire controlling lot planning and encourage the provision of a water supply adequate for firefighting. Protection of existing forest and other vegetation will be accomplished through the designation of open space or preservation areas where development is conducted.

E. Development should be encouraged that is sensitive to the needs of wildlife. Note that habitat protection is also one objective of the wetlands and stream corridor protection strategies. Wildlife habitat maps have been prepared to aid in implementation of this strategy.

F. The county will use its development code to encourage development that protects scenic views.

Future land use in Franklin County, including the private lands within the Project Boundary, will be guided in part by the 2022 Franklin County Comprehensive Plan. The Franklin County (2022) land use policy addresses the following issues related to agricultural, industrial, commercial and recreational uses:

Agriculture

- Franklin County will encourage preservation of prime agricultural land. However, preservation of agricultural land should not override the option of the landowner to determine the use of his property.

- It shall be the policy of Franklin County to recognize the economic importance of agriculture in Franklin County by discouraging development that may conflict with existing farm operations, requiring future rural residents to acknowledge the right of neighboring agricultural operations to continue, and discourage the conversion of productive croplands to other uses.

- This policy recognizes both the importance of agriculture and the possibility of conflict between agricultural and other land uses. These implementation strategies are designed to minimize that conflict:

    A. Franklin County will enforce I.C.31-3805, a state statute that requires participation of potentially affected irrigators in reviewing proposed subdivisions and requires developers to either transfer the water rights away from a parcel before it is subdivided or provide a central irrigation system. The county will also use its development code to require the explicit permission of an irrigation entity for any additional discharge of surface runoff into its system.

    B. Developers or individual landowners will be required to present development plans, subdivision applications, and building permit applications to irrigation entities for review and comment when service, distribution, or storage facilities are adjacent to or within the property boundaries of the proposed development or building side. When safety, water quality, maintenance easements, and other

issues are a concern, it will be the responsibility of the developing entity to prove suitability of the proposed development or building site or sites.

C. Franklin County will attempt to minimize friction between rural residential development and existing agriculture operations. Wherever rural residential development is permitted, the county may require an easement or buffer in favor of the continuation of normal farm operations.

D. Franklin County will also discourage industrial or commercial development within areas that conflict with or adversely affect established agricultural operations.

E. Large agricultural enterprises (dairies, feedlots, animal solid waste composting, handling of agricultural chemicals, etc.) can have an adverse impact on nearby developments or dwellings. All animal confinement operations regardless of size require application, review and compliance with the Franklin County ordinances prior to issuance of a building or operating permit.

F. The same scrutiny will be applied to proposed residential developments that may be incompatible with existing agricultural industries.

G. The development code will require mitigation of potential nuisances as the result of improper handling of solid waste, and the odor, insects, etc. generated by the improper keeping of livestock on residential lots.

Commercial

- Franklin County will encourage commercial development within areas that do not conflict with, or adversely affect, established agricultural, industrial or residential developments.

    A. The Franklin County Development Code will require mitigation of potential nuisances including noise, glare, building height and bulk, activity levels and other relevant measures. Retention or installation of landscaped buffers between potentially incompatible uses may be required.

    B. Home occupations will be permitted in Franklin County, subject to conditions that assure their compatibility with neighboring uses.

    C. There are extensive mineral resources in Franklin County, the development of which may conflict with nearby land use. The Franklin County Development Code will include performance standards designed to assure that new or expanded mineral extraction does not adversely affect neighboring uses nor water quality.

    D. The county will use its development code to encourage cooperative site planning, including shared access drives and parking, and shared buffers and open space. Franklin County will encourage preservation of prime agricultural land.

Industrial

- Franklin County will encourage industrial development within areas that do not conflict with, or adversely affect, the established agricultural, commercial or residential developments.

    A. The Franklin County Development Code will require mitigation of potential nuisances including noise, glare, building height and bulk, activity levels and other relevant measures. Retention or installation of landscaped buffers between potentially incompatible uses may be required.

    B. "State Land Use Code" will be used to determine industrial classification.

Residential

- It shall be the policy of Franklin County to maintain the natural assets of the recreational areas within the county. These areas will be subjected to the same requirements as set forth in the Natural Resources policy (see above). Additional requirements and implementation strategies are:

    A. Development density must not affect water quality where individual wells are used in lieu of a central water system. Southeast District Health Department standards will provide density guidelines pertaining to acceptable sewage systems.

    B. Recreational developments must prepare a fire protection plan that will delineate fire-wise construction, design and materials, defensible space, fuel load assessments, etc.

    C. Visual sensitivity will be addressed by the standards for recreational development. Density levels will be set to protect the pristine environment desired by those who reside on a full or part time basis in forest, meadow, waterfront, riverside, streamside, or view enhanced areas.

    D. Commercial development, home occupations, isolated lodges and stores may be permitted in recreational areas subject to conditions assuring compatibility with neighboring uses.

    E. Industrial development may be prohibited in recreational areas.

    F. Compatibility of proposed developments will be evaluated on the basis of building height, environmental factors, proposed uses, activity levels, and similar measures. Retention or installation of landscaped buffers between potentially incompatible uses may also be required.

    G. The County will encourage cooperative site planning, including shared access drives and parking, and shared buffers and open space.

Finally, the Franklin County (2022) Comprehensive Plan specifies a development policy that states: "It shall be the policy of Franklin County to limit development appropriate for the site and area's rural character, and to encourage a development pattern that discourages conversion of productive cropland to other uses, respect environmental limitations, and provide open space. The county will encourage a pattern of development on suitable sites that avoid areas with limited or restricted access to public facilities and services and environmentally sensitive areas. A lower density of development may be required in areas where there is a potential hazards of ground water contamination, potential aquifer depletion, or contamination as determined by countywide water availability research. All Development must pay for itself. Franklin County tax dollars shall not be used for the development of Residential, Commercial, or Industrial Developments."

4.8.10 Existing Protection, Mitigation, and Enhancement Measures

The Conservation Land Use classification is designated for most of the Oneida Development. It protects ecologically sensitive areas, particularly riparian zones, islands, and wetlands. The Oneida Site Plan (Cirrus, 2015) was developed to guide management actions throughout the development area. It outlines management actions to protect resources. Recreation uses (camping, picnicking, river access) are allowed in designated use areas. Unauthorized camping and river access sites were closed. Vegetation management included the treatment of noxious and invasive weeds.

4.9 AESTHETICS AND VISUAL RESOURCES

The Bear River Valley at the Oneida Development and the proposed Oneida Pumped Storage Facility is characterized by forested hills and mountains in the distance, with rangelands and agricultural lands, as well as dispersed homes, ranches, and small towns nearby. Conifer forests occur on upland slopes, grasslands and aspen groves are found in the middle slopes, and agricultural lands and rangelands are found mostly in the river valley.

The proposed Oneida Pumped Storage Facility is within the Semiarid Hills and Low Mountains EPA ecoregion (Level IV) that is characterized by rolling hills, alluvial fans, valleys and scattered mountains. The semiarid hills and low mountains zone (5,500 to 6,100 feet) is between the higher elevated Bear River Range, home to Cache National Forest to the east (above 6,000 feet) and lower elevated Malad and Cache Valleys to the south (below 6,000 feet) (EPA, 2023). Lands surrounding the Project area are undeveloped with the exception of pasture, cropland, and recreational facilities.

The existing Oneida Reservoir is fed from the Bear River, originating from the north and Cottonwood Creek traversing from the west. The Oneida Reservoir is in between Highway 34, which eventually crosses Bear River north of the reservoir, and Highway 36. Highway 34 is west of the Project area, whereas Highway 36 is east. No views of the Oneida Reservoir can be seen from Highway 34 or Highway 36. North Oneida Narrows Road (also referred to as N. Maple Grove Road) is an unpaved access road that is located on the eastern shore of the reservoir. Visible components of the Oneida Development that currently exist consists of the embankment dam, a portion of the concrete dam, reservoir, intake structure, water conveyance system, powerhouse, and tailrace. Figure 4.9-1 shows locations of key viewpoints of the Oneida

Development and the proposed Oneida Pumped Storage Facility location from publicly accessible areas.

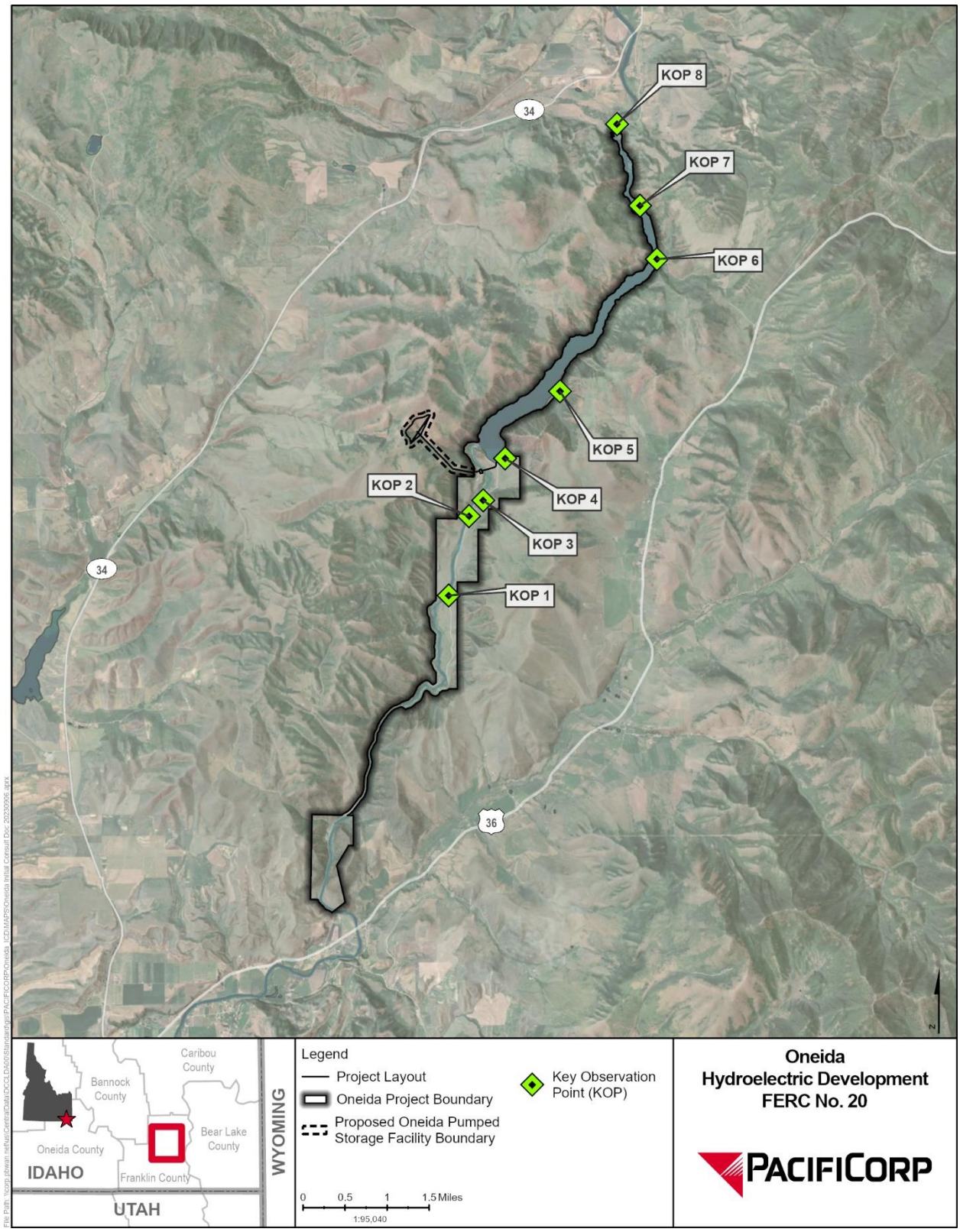


Figure 4.9-1. Key observation points of the proposed Oneida Pumped Storage Facility from publicly accessible areas around the existing Oneida Development.

During the previous relicensing of the Bear River Project, a visual assessment of the area was conducted by PacifiCorp following BLM's Visual Resource Assessment procedures (PacifiCorp, 1999). The visual assessment consisted of classifying the scenic quality of the area based on four attributes: physiographic characteristics, landscape attributes, viewer sensitivity, and distance.

Eight key observation points (KOP) around the Oneida Development and the proposed Oneida Pumped Storage Facility were established to assess the visual quality of the area. The viewpoints were selected based on proximity to existing Oneida Development facilities, potential views of the proposed Project, and public accessibility. The KOPs are summarized as follows:

- KOP 1 is located downstream from the Oneida Narrows Put-In site but upstream from Redpoint Campground. This location provides publicly accessible views of the proposed Project area along the Oneida Narrows Public Access Road.

- KOP 2 is located downstream at the Oneida Narrows Put-In access site. The existing reservoir and dam are not visible from this location however this location could provide views of the proposed Oneida Pumped Storage Facility.

- KOP 3 is located on the access road near the southeast corner of existing Oneida Powerhouse substation. KOP 3 overlooks the substation and contains constructed features of the Oneida Development with the middle ground being the eastern side of a hill. The proposed Oneida Pumped Storage Facility may be visible from the access road in these areas.

- KOP 4 is at the Oneida Dam Day Use Area immediately southeast of the Oneida Dam. Views of the reservoir are dominant. A view of the existing Oneida Development components includes a white/gray line of concrete dam and steel superstructure of the intake tower and spillway structure on the opposite shore. Views of the proposed Oneida Pumped Storage Facility are likely from the day use area, specifically from the boat ramp, interpretive signage area, and when traveling toward the powerhouse on the public access road.

- KOP 5 is at Maple Grove Campground, and views of the reservoir are dominant. Views of the proposed Oneida Pumped Storage Facility would likely only be visible after launching from the boat ramp or at views just upstream of the campground. The campground is set back into a cove that screens views of the proposed Oneida Pumped Storage Facility.

- KOP 6 is at the head of the Oneida Reservoir and near the intersection of Oneida Narrows Road and N. Maple Grove Road, the nearest viewpoint to Maple Grove Hot Springs Retreat. Views of the physical structures of the proposed Oneida Pumped Storage Facility are not expected, but effects of operations, such as water level changes would be observable.

- KOP 7 is about 4 miles upstream of Oneida Reservoir on the access road. The views are dominated by natural landscape including the reservoir and surrounding hills. Little evidence of the features of the existing Oneida Development are visible. Views of the

physical structures of the proposed Oneida Pumped Storage Facility are not expected, but effects of operations, such as water level changes would likely be observable.

- KOP 8 is at a riverine section upstream of the project boundary at the confluence of Cottonwood Creek. Little evidence of the features of the existing Oneida Development are visible. Views of the physical structures of the proposed Oneida Pumped Storage Facility are not expected, but effects of operations, such as water level changes may be observable.

The assessment found the scenic quality of the area was typical of partially developed landscapes, with viewer sensitivity to the development being low to moderate (FERC, 2003). The study also determined the overall scenic classification of the area was Class III – meaning the visually character of the landscape is partially retained and changes to the landscape (i.e., the development's facilities) do not dominant the view of the observer (PacifiCorp, 1999).

For the license amendment application, PacifiCorp recognizes that additional viewpoints may be necessary along the Oneida Reservoir shoreline or downstream from the Oneida Powerhouse to fully characterize potential impacts from the proposed Oneida Pumped Storage Facility. However, these eight KOPs would be included in the aesthetics study to characterize potential viewpoints around the existing Oneida Development and the proposed Project.

4.9.1 Existing Protection, Mitigation, and Enhancement Measures

Although there are no measures directly related to protecting, mitigating, or enhancing visual resources at the Oneida Development, the existing Land Management and Shoreline Buffer Plan (LMP)[8] contains components that help preserve the visual character of the area. The LMP is further discussed in section 4.8, *Recreation and Land Use*.

4.10 CULTURAL RESOURCES

4.10.1 Project Cultural Resources Context

Regulatory Context

The Oneida Development is subject to numerous federal and state regulations as they relate to cultural resources. The sections below highlight the primary applicable laws and statutes.

Federal Laws and Guidelines

National Historic Preservation Act of 1966, as amended (16 USC 470 et seq.)

In addition to authorizing the establishment of the National Register of Historic Places (NRHP), this law sets forth the responsibilities of Federal agencies in the management of cultural resources. Section 106 of the Act, as implemented by 36 CFR 800, outlines the requirements of Federal agencies to take into account the effects of their undertakings, such as construction, permitting, funding, etc., on cultural resources that are either listed on the NRHP or are

[8] 115 FERC ¶62,044

determined eligible for listing on the NRHP (such sites are known as "historic properties"). Section 106 further outlines the responsibility of Federal agencies to consult with State Historic Preservation Officers, Tribes, and other interested parties as part of the process of considering the impacts of undertakings on historic properties.

Archaeological Resources Protection Act of 1979, as amended (16 USC 470aa-mm; 42 CFR 7)

This Act, frequently referred to as ARPA, provides for the protection of archaeological resources located on Federal lands through requiring permits to be obtained from the relevant Federal land management agency prior to the removal of artifacts from sites. This law is applicable for those portions of the Oneida Development, including the proposed Oneida Pumped Storage Facility, located on BLM and USFS Wasatch Cache National Forest lands.

Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001-3013; 43 CFR 10)

This Act, typically referred to as NAGPRA, establishes regulations for the treatment of Native American graves/burials, human remains, funerary objects, objects of cultural patrimony, and sacred objects found on Federal, Tribal, or trust lands. NAGPRA makes disturbance of such items a felony. The Act further requires that Federal agencies notify Native American, Native Alaskan, or Native Hawaiian Tribe with potential cultural patrimony over the remains or object(s) and make an effort to ascribe substantiated affiliation of the remains or object(s) with a single Tribe. NAGPRA applies to those portions of the proposed development located on BLM and USFS lands and would apply to any federal lands annexed, leased, or otherwise included the FERC boundary for the purpose of the Oneida Pumped Storage Facility amendment.

American Indian Religious Freedom Act of 1978 (42 USC 1996)

This Act, generally referred to by the acronym AIRFA, establishes the Federal government policy of protecting and preserving the right of Native Americans, Native Alaskans, and Native Hawaiians to practice their traditional religions. In addition to providing special considerations to these groups for the possession of sacred objects otherwise prohibited to possess for other groups under such regulations as the Endangered Species Act, it mandates granting to these groups the right of access to sacred sites for religious activities. The right of access referred to in this Act does not apply to privately held lands but refers only to Federal lands, such as the BLM and USFS lands. Federal policies, such as those guiding the granting of permits or licenses, must comply with AIRFA.

Executive Order 13007: Indian Sacred Sites Order (1966)

The Indian Sacred Sites Executive Order follows upon the mandates of AIRFA to accommodate access to sacred sites on Federal lands by Native Americans, Native Alaskans, and Native Hawaiians for the purpose of religious or ceremonial practice but further mandates that Federal agencies will "avoid adversely affecting the physical integrity of such sacred sites." The right of access referred to in this Act does not apply to privately held lands but refers only to Federal lands, such as the BLM and USFS lands.

Application for License for Major Project—Existing Dam, Report on Historical and Archaeological Resources (18 CFR 4.51(f)(4))

This regulation represents a stipulation in the license application process to implement FERC's responsibility to comply with Federal cultural resource laws when licensing (or re-licensing) hydroelectric projects under the Federal Power Act. The regulation requires submission of a report identifying historic properties within the project area or area of potential effects, disclosing the potential impact of project operations on said properties, and providing for avoidance or mitigation of adverse impacts.

Guidelines for the Development of Historic Properties Management Plans for FERC Hydroelectric Projects (2002)

This document, prepared by FERC in consultation with the Advisory Council on Historic Preservation, provides guidelines for the preparation of HPMP documents and outlines required content. The document is designed to assist FERC in complying with the National Historic Preservation Act and its implementing regulations, 36 CFR 800, in considering and managing the effects of FERC licenses on historic properties within specific project areas.

Idaho State Statutes

In addition to the suite of Federal laws governing the management of cultural resources, several statutes from the State of Idaho are also applicable. These statutes are outlined here:

Idaho Code (I.C.) 27-502: Protection of Graves, Prohibited Acts

Without distinguishing exceptions for land ownership prohibits the willful removal, mutilation, defacement, injury or destruction of any grave or cairn. Inadvertent disturbance through activities such as construction, mining, or logging, requires the reinterment of the remains and coordination with the director of the Idaho State Historical Society (ISHS) as appropriate. It further prohibits the possession of any artifacts or human remains taken from a grave or cairn after January 1, 1984 (with exceptions as described in I.C. 27-053), the public display or exhibit of any human remains, and the sale of artifacts or human remains taken from a grave or cairn. Possession or sale of artifacts recovered from locations other than graves or cairns is not prohibited by this statute.

I.C. 27-503: Protection of Graves, Permitted Acts

This statute provides for the excavation of human remains and associated artifact from a grave or cairn by professional archaeologists. The statute mandates coordination of the excavation of the remains or artifacts with the director of the ISHS and appropriate Native American Tribes (if the remains are of a Native American or prehistoric individual) and reinterment of the remains following scientific study. The statute also requires written notification of the director of the ISHS and written consent from the relevant Native American tribe, if applicable, prior to the excavation.

I.C. 27-504: Protection of Graves, Damages

This statute outlines the permissible time, place, and manner for the imposition of civil actions against persons who have violated Idaho Code 27-503. It also provides for specific penalties, such as forfeiture of illegally obtained artifacts or equipment used in the illegal disturbance of a burial.

4.10.2 Cultural Context of the Project Area

The Oneida Development and the area for the proposed Oneida Pumped Storage Facility are in an area of rich prehistory and history. The sections below provide a review of the cultural context within which the area is situated.

Prehistoric Context

The Bear River Project, including the Oneida Development and proposed Oneida Pumped Storage Facility, are located within the northern portion of the Great Basin culture area of the Middle Rocky Mountain Province. Although various chronological frameworks have been proposed for the area, and, indeed, refining of the regional chronology is an ongoing question, for the purposes of discussion, the chronology will follow the overall framework utilized by Southworth, et al. (1999), which incorporates chronological summaries provided by Swanson (1974), McDonald (1983), and Butler (1986). This chronology divides the prehistory of the region into three main periods associated with five phases: The Paleoindian period (14,500–7200 B.P.) including the Birch Creek Phase (11,000–7200 B.P.); The Mountain Archaic Period (7200 B.P.–A.D. 500) which includes the Bitterroot Phase (7200–2400 B.P.), the Beaverhead Phase (3400–2900 B.P.), and the Blue Dome Phase (2900 B.P.–A.D. 500); and the Basin Archaic Period (A.D. 500–1805), which includes the Lemhi Phase (A.D. 1250–1805) (Southworth et al., 1999).

Paleoindian Period (circa 14,500 – 7,200 B.P.)

The Paleoindian period within the Intermountain West is generally characterized by subsistence technology dependent on the acquisition and processing of Pleistocene megafauna, with less emphasis on the acquisition and processing of vegetal material (Frison, 1991). The Bonneville Stand of Pleistocene Lake Bonneville had receded to the Provo Stand by 14,500 years before present opening up fluvial drainages between Black Canyon, Idaho and Preston, Idaho (Currey et al., 1984). After 14,500 B.P., the climate warmed and Lake Bonneville and other Pluvial lakes began to dry, exposing millions of acres of fertile land that attracted such megafauna as mammoth, mastodon, ground sloth, horse, camel, sabertooth cat, and giant short-faced bear (Grayson, 1993). The presence of single-leaf pinon, juniper, limber pine, ephedra, and shadscale and grass communities complimented the rich faunal assemblage in the northern Great Basin (Grayson, 1993).

Human populations during this time were highly mobile large game hunters, often identified by large lanceolate fluted points such as Clovis, Folsom, and Plano points (Southworth et al., 1999). The Paleo-Indian Period in southeastern Idaho is associated with one phase. The Birch Creek Phase began approximately 11,000 years ago when small animals and processed plant materials were added to the Paleo-Indian diet (Southworth et al., 1999; Zier and Peebles, 1982). Un-fluted, lanceolate Birch Creek projectile points were also added to the Paleoindian tool kit at this time

(Southworth et al., 1999). The end of the Birch Creek Phase at 7,200 B.P. is associated with the gradual extinction of North American Pleistocene megafauna (Butler, 1986; Southworth et al., 1999).

Mountain Archaic Period (7,200–1450 B.P.)

The onset of the Archaic period is defined on the basis of a well-documented and notable increase in regional temperatures and the onset of a significant drying phase that had dramatic effects on the regional ecosystem at about 8,000 B.P. or 6,000 B.C. (Madsen et al., 2001). Vegetation types and patterns changed, along with associated faunal resources. Human populations responded accordingly, with adaptations shifting from previous strategies. Three phases have been defined for the period (Butler, 1986; Southworth et al., 1999): the Bitteroot Phase, the Beaverhead Phase, and the Blue Dome Phase.

The Bitterroot Phase lasted approximately 3,800 years, from 7,200 to 3,400 B.P. Human populations remained mobile but changed their subsistence strategy to a hunting-gathering strategy emphasizing residential base camps with associated special-use loci (Gallagher, 1979; Plew, 1980; Steward, 1938). Groups increased their reliance on modern forms of large game, such as bison, deer, and sheep (Butler, 1978; Butler, 1986). Lithic technology also changed, focusing on smaller side- and corner-notched projectile points thrown from an atlatl (Butler, 1978; Franzen, 1981; Southworth et al., 1999) and more intensive use of grinding stones.

The Beaverhead Phase constituted a relatively short period of time, approximately 500 years. Dating between 3,400 and 2,900 B.P. and is characterized only by an increased number of small, corner-notched projectile points compared to the number of larger of Pinto and other side-notched projectile points (Franzen, 1981; Southworth et al., 1999). Also, during this phase, cultural groups occupied higher elevations in a greater frequency than seen previously (Southworth et al., 1999; Swanson, 1974).

Between 2,900 and 1,450 B.P., higher numbers of smaller, expedient, corner- and side-notched projectile points were utilized (Southworth et al., 1999). The Blue Dome Phase appears to represent a time when the native inhabitants of southeastern Idaho were hunting large numbers of small animals, such as deer (McDonald, 1983; Southworth et al., 1999). An expedient tool technology was employed, resulting in larger numbers of lithic scatters and more emphasis was placed on communal hunting, as evidenced from the presence of constructed traps and corrals (Southworth et al., 1999:24; Zier and Peebles, 1982). Long-term residential base camps were common and associated special-use loci ranged from sacred sites to re-used mass kill sites (Southworth et al., 1999:24; Zier and Peebles, 1982).

Basin Archaic Period (1,450–145 B.P.)

The Basin Archaic Period in southeastern Idaho is characterized by the several substantial changes in material culture that appear to have complex causes. Between 1,350 and 1,250 B.P., pottery first appears in southeastern Idaho (Neudorfer, 1976). Early pottery types recognized in the area include Great Salt Lake Gray, Promontory Gray, and a possible distinct type of Southern Idaho Plain Ware (Butler, 1983; Plew, 1979). Roughly at the same time, new projectile point types, most notably Eastgate and Rose Springs points - appear in the area. Plew (1980) suggests

that the settlement pattern remains similar to previous portions of the period, but that length of occupation may decline, and specialized sites may be less abundant.

There is considerable debate over whether or not these changes provide evidence of affinities with, or even arrival of, Fremont (Salt Lake Variant) cultures from the south during this portion of the period (Adovasio et al., 1982; Butler, 1981, 1983; Plew, 1979). During the early portion of this period, there is evidence for increasing sedentism and exploitation of native fish (Plew, 1986). Basketry (Adovasio et al., 1982) and pit-houses found in western Idaho also suggest that Fremont populations may have inhabited southeastern Idaho by 1,250 B.P. Butler (1983) suggests that Fremont populations persisted in the region longer than they did in the south, and that they were replaced by Numic-speaking Shoshonean populations by 550 B.P.

In the latter half of the period, starting around 1250 A.D., material culture again changes, though the timing of the change is poorly defined. The appearance of brownware ceramics, increasing frequencies of Desert Side-notched and Cottonwood triangular points, and other aspects of material culture found in the region has been taken as evidence of an expansion of Numic-speaking peoples into the region from the southwest (Madsen, 1975; Plew, 1980:31; Rhode, 1994). However, whether this expansion is evidence of replacement of local populations or absorption into new linguistic and cultural groups remains open to debate. The time period is defined as the Lemhi Phase. The exact timing of the appearance of either new groups or new cultural adaptations is not entirely clear, as Fremont adaptations may have persisted into the 1600s, and the interaction between Fremont and other adaptations is not entirely clear (Southworth et al., 1999). By the final portion of the period, European trade goods appear in archaeological assemblages (Southworth et al., 1999), and by the early 1800s, the region enters into what has been defined as the historical period with contact between indigenous populations and Euroamerican colonizers.

Indigenous Populations

Regardless of the details of the mechanisms of the population movement, at the time of historic contact in the early 19th century, the native populations of southeastern Idaho were primarily Numic-speaking Northern Shoshone and Bannock populations as well as the Northwestern Band of the Shoshone Nation (Murphy and Murphy, 1986). The Northern Shoshone and Bannock inhabited the lands that included most of southern Idaho below the Salmon River (Murphy and Murphy, 1986). Today, most of these people live on the Fort Hall Indian Reservation north and east of Soda Springs, Idaho and on the Duck Valley Indian Reservation near Owyhee, Nevada. The Northwestern Band of the Shoshone Nation occupied many of these same areas, though many moved into and still inhabit small communities in Northern Utah (Southworth et al., 1999).

Northern Shoshone and Bannock

Although the Northern Shoshone and Bannock bands were relatively indistinguishable culturally and, in fact, intermarried and shared winter headquarters, they differed in one respect. They spoke mutually unintelligible languages (Kroeber, 1907; Murphy and Murphy, 1986). The Bannock were Northern Paiute who had migrated from the vicinity of present-day Oregon and spoke the Paiute language (Murphy and Murphy, 1986). Numic-speaking Shoshone populations had moved into southeastern Idaho from the south and southwest (Madsen, 1975; Plew, 1980; Rhode, 1994).

In spite of their different languages, the Shoshone and Bannock shared similar subsistence patterns as well as social and political organization. For example, both groups organized themselves into widely dispersed bands of extended families engaging in hunting, gathering, and fishing (Murphy and Murphy, 1986). Band autonomy, with the notion of group or tribe maintained through collective consent, characterized the political organization of each group.

Although Shoshone and Bannock cultural adaptations reflect those of the Great Basin, the proximity of their territory to the Plateau culture resulted in the adoption of some Plateau cultural practices, particularly fishing. Evidence indicates that both groups utilized spears, harpoons, traps, dip nets, seines, and weirs to catch salmon and other anadromous fish (Walker, 1978). Northern Shoshone and Bannock territory extended as far east as western Montana on the eastern side of the Continental Divide (Steward, 1938). The Northern Shoshone and Bannock may have had horses as early as late seventeenth century (Haines 1938a, 1938b) and were definitely mounted by the mid-1700s (Steward, 1938; Walker, 1978). Because of their access to horses, these people were highly mobile and covered an extensive area while foraging for food. There were two major centers of buffalo-hunting people, Fort Hall and the Lemhi River (Murphy and Murphy, 1986; Steward, 1938). In the fall, the Fort Hall people formed into a large group for hunting buffalo east of present-day Bozeman, Montana. During the rest of the year, they split into smaller groups for spring salmon-fishing below Shoshone Falls and digging camas roots in the summer on the Camas Prairie. They traveled to the mountains of southeastern Idaho and northern Utah to hunt deer and elk.

Other Northern Shoshone bands included the people who lived along the Boise, Payette, and Weiser rivers; Jackrabbit-Eaters, who lived south of the Snake River, between the watershed separating the Owyhee and Bruneau Rivers and the area of Bannock Creek; and the Sheep-Eaters who lived in the Sawtooth Mountains area near the PacifiCorp Bear River Developments. These bands either had few or no horses. Although they still conducted seasonal migrations in search of food over a wide area, for the most part they did not participate in the great buffalo hunts of the Fort Hall and Lemhi River people (Stuart, 1980). The Sheep-Eaters subsisted primarily on mountain sheep but also hunted deer, caught salmon, and collected roots and berries. These Shoshone sometimes traveled into Utah for pine nuts (Murphy and Murphy, 1986).

The lifeways of the Northern Shoshone and Bannock bands varied according to environment. For the example, the Fort Hall and Lemhi bands were much influenced by Plains culture; other bands were more like their Western Shoshone neighbors. The Fort Hall and Lemhi people generally lived in Plains-style tipis. Northern Shoshone further to the west, lived in small conical lodges made of sagebrush, grass, or woven willow branches (Murphy and Murphy, 1986).

Unlike their Western Shoshone neighbors, most of the Northern Shoshone depended more upon hunting for subsistence than on plant-gathering. As stated previously, the environment and access to horses dictated what they ate. The Fort Hall and the Lemhi to the north relied primarily on buffalo. Those bands that lived nearest the major rivers subsisted primarily on salmon. Individuals or smaller hunting parties hunted antelope, elk, mountain sheep, and deer. There were very few shamanistic antelope drives among the Northern Shoshone and Bannock. Other small game included sage hens, grouse, ground hogs, and woodchucks. Salmon, sturgeon, suckers, perch, and trout were harpooned or caught in weirs made of stones and brush. The Northern Shoshone also collected plants, including pine nuts, camas bulbs, yampa root, tobaccoroot, bitterroot, pine nuts, and a variety of berries, seeds, and other roots (Stuart,

1980:19). It should be noted, as mentioned above, that plant-gathering was usually secondary to hunting expeditions (Murphy and Murphy, 1986; Steward, 1938; Stuart, 1980; Thomas et al., 1986).

The Lewis and Clark Expedition moved through the area in 1805, exposing the Shoshone and Bannock to Euroamericans for the first time. Sacajawea, a Lemhi Shoshone who had been captured and raised by Plains Indians, interpreted for the explorers. Her presence convinced the Shoshones to assist the expedition (Schwantes, 1991). In the years following the expedition, European fur trappers entered Northern Shoshone and Bannock territory. Relations between the trappers and Shoshone and Bannock were generally good, although the Northern Shoshone and Bannock bands became increasingly dependent on the goods introduced by the Euroamericans. In 1834, the Fort Hall trading post was established and would be adjacent to the Oregon Trail, which was to cut through Shoshone and Bannock territory by the 1840s. Subsequent emigration over the trail resulted in emigrant populations outnumbering the local Indian population.

Migrants continued over the trail unimpeded until 1854 when young warriors began attacking the wagon trains without tribal sanction (Madsen, 1958). In 1860, tensions heightened as migrant members of the Church of Jesus Christ of Latter-Day Saints (Mormons) established Franklin, the first permanent settlement in Idaho (Schwantes, 1991). In 1867, Shoshones living in Wyoming and Idaho were removed to the Fort Hall Reservation in Idaho (Liljeblad, 1972). The Bannock, promised a reservation of their own, never received any land for this purpose. The next year, 1868, the Shoshones negotiated the Treaty of Fort Bridger, which set aside 1.8 million acres of land for the tribes. However, later acts and land reductions reduced the overall size of the reservation to less than 550,000 acres (Southworth et al., 1999).

Northwestern Band of the Shoshone Nation

What is now the Northwestern Band of the Shoshone Nation includes peoples who were originally associated with the Western Shoshone (Thomas et al., 1986). These groups inhabited much of the central Great Basin and occupied northwest Utah. Like the Northern Shoshone and Bannock, they practiced a seasonal round of hunting and gathering of game and vegetal resources (Thomas et al., 1986). During the reservation period, this larger group was divided as reservations were established in Nevada. The groups of Western Shoshone from Utah were originally intended to be incorporated into reservations in Nevada, but many did not relocate to those areas. Some members moved to the Fort Hall Reservation and others to the Wind River Reservation (Southworth et al., 1999). However, others formed small communities in northern Utah (Southworth et al., 1999). These populations were ultimately recognized by Congress in 1986 as the Northwestern Band of the Shoshone Nation (Southworth et al., 1999:27).

Historical Euroamerican Context

Euroamerican contact and Euroamerican history in the region began when the Lewis and Clark expedition came into contact with a group of Shoshone at Lemhi Pass in 1805. Numerous excellent summaries of Idaho Euroamerican history have been produced (e.g., Beal, 1942; Beal and Wells, 1959) including summaries specific to the PacifiCorp Bear River Project area (Franzen, 1981; Gehr et al., 1982; Hays et al., 2004; Southworth et al., 1999). A synthesis of these studies follows, with an emphasis on the types of resources in the region. Thus, this

synthesis is largely based on the documentary record as summarized previously by Franzen (1981), Gehr, et al. (1982), and Southworth et al. (1999).

Early Exploration and Interaction with Native Populations 1805-1839

Following initial exploration by the Lewis and Clark expedition, further expansion into the area was driven by interest in exploitation of the various natural resources, particularly the fur trade. A number of forts were established including Fort Henry, which was relatively short lived, Fort Boise, and Fort Hall. Interaction with Native American groups during this period was extensive, with interactions ranging from coordinated trapping and trading to violent encounters.

Overland Migration and Settlement 1840-1859

Over-exploitation and a variety of other factors effectively ended the fur trade by the 1840s. A period of westward migration of Euroamerican emigrants began into and across the region, with much of the initial travel passing through Idaho, rather than holding Idaho as a destination. The Oregon Trail crossed the area through the Snake Valley from Fort Hall to Fort Boise, with two forks splitting at Three Island Crossing. Popular campsites were located at a number of areas along the trail, including Salmon Falls Creek and Big Pilgrim Gulch. The trail passed what is now Soda Springs and ran along the Bear River. Portions of the trail are now under Alexander Reservoir, part of the Soda Development (Southworth et al., 1999). Other trails passing through the region included portions of the California Trail and the Nez Perce Trail. As the number of travelers increased, Native American attacks on parties increased as well, leading to some escalation in hostilities. One of the earliest permanent settlements other than forts and trading posts was established at the end of this phase. This settlement, Franklin, Idaho, was established in 1859 by Mormon pioneers.

Agriculture, Mining, and Industrial Development 1860–1890

The subsequent period saw both an increase in the Euroamerican population of the region as well as in agriculture, mining, and industrial development. Following the establishment of Franklin, more Mormon populations entered the area and were generally successful, but serious settlement did not begin until the latter portion of this period. The discovery of gold mid-century stimulated an Idaho gold rush that also increased the population. By 1863, the population of the Boise region had swelled to about 17,000, stimulated, in large part, by mining. Immigrant laborers were common, including Chinese populations.

Mining included panning, placer techniques, and dredging, and mills were established in a number of areas. Mining stimulated other aspects of the economy, including the cattle industry and agriculture to supply the miners. Cattle in particular saw a boom in the 1880s, but a bad winter in the late 1880s was to have a depressing effect on the industry. Sheep herding, however, grew in importance throughout the late 1800s and into the 1900s. Irrigation was also expanded at this time and came to include a number of canals along the Snake River valley, particularly after 1879. The number of canals would reach over 250 by the turn of the century. Bridges were constructed at this time, increasing trade and transportation possibilities. Trade and mining also drove the construction of the first railway into the area, a line from Brigham City, Utah to Franklin and Pocatello and then northeast to Soda Springs. By 1880 the line reached the Montana border, and a number of other lines were to follow. Towns sprung up along the railroad line as well, and telegraph and communication systems followed. Over the span of this period, relations with Native American groups declined, and the American military increased its presence, leading

to a number of battles/massacres culminating in the Bannock War of 1878. A reservation for the local Native American populations had been established at Fort Hall in 1869, and after the final battles most of those populations retired to this locale.

Early Statehood

Idaho became the 43rd state in 1890. Ranching and farming continued to develop throughout the area. The Twin Falls and Boise areas grew extensively at this time, stimulated in large part by large-scale irrigation projects. These also led to the establishment of more farming hamlets. Immigrant Basque groups also moved into the area and formed a major portion of the sheep herding economy. Government land management, first begun in earnest in the area with land surveying and the establishment of the base line and principal meridian near Boise in 1868, was to increase as new agencies were developed to handle national parks, forests, soils, and grazing lands.

The Development of Hydroelectric Power

At present, the project area encompasses three major hydroelectric developments, all of which were developed during the first part of the 20th century. Detailed histories of these developments are discussed in Southworth, et al. (1999). The following summary is intended to provide a cursory review of the historical chronology of the developments.

Demand for electric power in the Intermountain West was stimulated by two major forces: community demand for domestic and urban infrastructure and demand for power to drive industrial operations (Southworth et al., 1999). Of these two, the latter may well have been the primary driving force. The earliest power plants in the region were originally established by Lucien L. Nunn, who built plants initially in Colorado and later in Utah to drive his mining operations (Southworth et al., 1999). By 1900, he had established hydroelectric plants in Logan and Provo Canyons in Utah, and he began to look northward for additional power opportunities along the Bear River.

Nunn's interest in hydroelectric power from the Bear River would ultimately lead to the construction of the four facilities. Nunn initiated construction of the Grace Hydroelectric Complex on the Bear River in the early 20th century (Southworth et al., 1999). The plant was completed in 1908. It was a historic structure from the beginning, as it was one of the first multi-purpose plants in the area, if not the world, generating 11,000 kW (Southworth et al., 1999).

The success of the plant would attract the Utah Power and Light Company (UP&L). Formed in 1912, the company undertook to consolidate a number of different Utah power companies to increase overall power to Salt Lake City and other urban centers in northern Utah and Southern Idaho (Southworth et al., 1999). In 1912, the UP&L purchased the Grace plant from Nunn and began an expansion. In 1917, this expansion included construction of a second plant at Cove, generating 7500 kW and supplied by a flume from the Grace plant (Southworth et al., 1999), thus completing the overall Grace-Cove Hydroelectric complex. The Oneida Dam and Reservoir construction and filling also begun around this time. Construction began in 1913 and the plant was generating 30,000 kW by the time it went into operation in 1915 (Southworth et al., 1999). The UP&L then undertook to construct the Soda Hydroelectric Power Plant near Soda Springs. Construction of the dam was completed in 1923, and it created Alexander Reservoir (Southworth

et al., 1999). The plant housed two power units generating 14,000 kW (Southworth et al., 1999). The development of these and other generating facilities in southern Idaho and northern Utah during the early part of the 20th century provided the power to drive the economic development of the region.

4.10.3 Known Cultural Resources in the Project Area

PacifiCorp conducted a records review through the Idaho State Historic Preservation Office (SHPO) to identify past cultural resource surveys and documented cultural sites in the pumped storage study area. The search area extended ½ mile from the edge of the preliminary facility locations at the time the search was conducted in June 2023. A total of 33 previous cultural resource surveys have been carried out in this area. The surveys occurred between 1989 and 2023. Most of the surveys have been associated with PacifiCorp's operations and activities at the Oneida Development, including removal of the Oneida camp residential structures, relicensing of the Bear River Project, monitoring of known archaeological sites for operational impacts, and development of interpretive signs. Several others of the 33 prior surveys were conducted by or for BLM on its lands in the study area and by or for the Idaho Department of Transportation.

Three archaeological sites, six historical structures, and one linear historical site are known to be present near the proposed Oneida Pumped Storage Facility. All of these previously documented resources are located in Oneida Canyon and along the Bear River. Most of the resources are associated with the Oneida Development itself and include the Oneida Dam and powerhouse complex, which encompasses the intake, penstock, surge tank, switch and transformer yard, warehouse, and maintenance building. The dam and powerhouse complex have been determined eligible for the National Register under Criteria A and C, and each of the components listed here is considered contributing to that eligibility.

The former Oneida residential camp (SHPO resource #41-017896) is also located near the proposed Oneida Pumped Storage Facility; however, all of the historical structures have been removed, and the area has been reclaimed. Remnants of the site are largely limited to broad landscape features, such as the human-made earthen bench on which the camp was located.

Other cultural resource sites in the study area for the proposed Oneida Pumped Storage Facility include the partial remains of the original dam construction railroad (site #10FR27) and remains from the original construction camp (site #10FR43). Both sites have been determined eligible for the National Register under Criterion A, and site 10FR43 is also considered eligible under Criterion D. A historical artifact scatter (site #10FR38) that may represent the remains of homestead is also present in the records review area. This site has been determined ineligible for the National Register under all criteria. A possible stable structure (SHPO #41-17943) is located immediately south of this site but may have been removed or demolished according to SHPO records. The final previously documented resource in the area is a steel stringer bridge (SHPO #41-17908) crossing the Bear River south of the Oneida Powerhouse. This bridge, which has been determined ineligible for the National Register under all criteria, provided access to the Oneida residential camp on the west side of the river.

4.10.4 Existing Protection, Mitigation, and Enhancement Measures

Cultural resources within the existing Oneida Project Boundary are managed under the Bear River Project Historic Properties Management Plan (HPMP), which was finalized in 2007 (Ellis, 2007) and approved by the Commission in 2008.[9] The HPMP establishes protocols to manage known historic properties to avoid, minimize, and/or mitigate adverse effects from capital development and Project operations. The HPMP also includes protocols for identifying as-yet cultural resources that could be affected by pumped storage operations and activities, including new development both within and outside the FERC boundary, and for responding to inadvertent discoveries of cultural resources or human remains. These protocols would apply to any development associated with the proposed Oneida Pumped Storage Facility.

Cultural resource enhancement measures at the Oneida Development include a series of interpretive signs located near the picnic area at the east end of the dam and past efforts to scan historical images of the hydroelectric facilities and ensure public access to the resulting images.

4.11 TRIBAL RESOURCES

No specific Tribal resources have been identified to date within the area of the proposed Oneida Pumped Storage Facility. Furthermore, none are known to be present within the broader Oneida Project Boundary. PacifiCorp maintains ongoing and close coordination with the Tribal Nations having patrimonial claim to the area to ensure open lines of communication to identify and evaluate sites of concern to said Nations.

4.11.1 Existing Protection, Mitigation, and Enhancement Measures

Tribal resources within the Oneida Project Boundary are managed, at least in part, under the Bear River Project Historic Properties Management Plan (HPMP), which is discussed in section 4.10.4 above.

4.12 SOCIOECONOMIC RESOURCES

Although the Bear River Project occupies lands in both Franklin and Caribou counties, the Oneida Development occurs entirely in Franklin County and the proposed Oneida Pumped Storage Facility would also only occur in Franklin County. Therefore, only socioeconomic resources of Franklin County are described below.

4.12.1 Patterns of Land Use

Franklin County, Idaho, encompasses approximately 426,474 acres (approximately 666 square miles) with predominant land uses being agriculture, open space, and urban development. These include public lands managed for multiple uses and private lands. Recreational uses consist of hunting, fishing, camping, and summer or seasonal use residences.

Approximately 70 percent of land in the county is public, most of which is managed by USFS, BLM, and BOR (Table 4.12-1). In Franklin County, USFS manages most of the forested land

[9] 123 FERC ¶ 62,229

(i.e., Caribou-Targhee National Forest) with some private forested land occurring along the boundaries managed by others. The privately owned land on the mountainous county border is used extensively for recreational purposes consisting of hunting, fishing, camping, and summer or seasonal use residences.

Table 4.12-1. Land ownership in Franklin County, 2023.

Land Ownership	Acres	Percentage
BLM	14,403	3.4
BOR	2,088	0.5
USFS	121,881	64.4
State of Idaho	13,283	3.1
Idaho Department of Fish and Game	5	<0.1
Private	274,774	28.6
Total	**426,434**	**100**

Source: DOI (2023)

4.12.2 Population

The 2022 census population estimate for Franklin County was 15,189, with a median household income of $56,677 (in 2021 dollars; U.S. Census Bureau, 2021). Less than half the population lives in Preston City (5,477). By population, the next largest are Franklin (706), Clifton (697), Dayton (546), Weston (440), and Oxford (39) (DataUSA, 2020). The remaining population in rural Franklin County resides in various small towns or unincorporated areas. The population of Franklin County is 90.3 percent White and 3.69 percent Hispanic. The median age in Franklin County is 33.5 years, with less than half of the population employed. The latest poverty rate is 9.7 percent (DataUSA, 2020).

4.12.3 Project Employment

Five full-time employees switch duties between the Bear River Project and other PacifiCorp hydroelectric facilities in Utah and Idaho. These include: Pioneer (FERC No. 2722), Weber (FERC No. 1744), Granite (FERC No. 14293), Stairs (FERC No. 597), and Santa Clara (FERC No. 9281) hydroelectric projects. These PacifiCorp staff also operate and maintain Bear Lake's Lifton pumping station.[10]

4.12.4 Sources of Employment

The total number of persons employed in Franklin County in 2021 was 6,425. The area economy employs the majority of persons in the private sector (Table 4.12-2). Approximately 50 percent

[10] The Lifton Pump Station pumps water stored in Bear Lake into the Bear River for agricultural use and to generate power.

of the working population are employed by the manufacturing, educational services, and health care and social assistance, and construction industries (Table 4.12-3).

Table 4.12-2. Employment sector of workers in Franklin County, 2021.

Classification	Population Estimate	Percent
Private wage and salary workers	5,230	81.4
Government workers	788	12.3
Self-employed in own not incorporated business workers	399	6.2
Unpaid family workers	8	0.1

Source: US Census Bureau (2021)

Table 4.12-3. Employment by industry in Franklin County, 2021.

Industry	Population Estimate	Percent
Agriculture, forestry, fishing and hunting, and mining	554	8.6
Construction	684	10.6
Manufacturing	1,367	21.3
Wholesale trade	118	1.8
Retail trade	606	9.4
Transportation and warehousing, and utilities	439	6.8
Information	114	1.8
Finance and insurance, and real estate and rental and leasing	205	3.2
Professional, scientific, management, administrative and waste services	308	4.8
Educational services, and health care and social assistance	1,080	16.8
Arts, entertainment, and recreation, accommodation and food services	580	9.0
Other services, except public administration	167	2.6
Public administration	203	3.2

Source: US Census Bureau (2021)

4.12.5 Existing Protection, Mitigation, and Enhancement Measures

No existing measures are in place pertaining to socioeconomic resources under the current license.

5.0 PRELIMINARY ISSUES AND STUDIES LIST

5.1 ISSUES PERTAINING TO THE IDENTIFIED RESOURCES

This section identifies resource issues that, at this point in the process, appear to require additional study or information gathering in order to assess the impacts of the proposed Oneida Pumped Storage Facility. This determination is based on the review of existing information on each resource category or subcategory provided in section 4 above, evaluated in light of the proposed construction and operation of the Oneida Pumped Storage Facility as described above in section 3.7 *Proposed Facilities* and section 3.8 *Proposed Operations*, respectively.

5.1.1 Geology and Soils

The Oneida Development has been studied and sampled extensively over the years but investigations into the geological conditions at the proposed upper reservoir sites have only begun. Further study will be needed for the purpose of determining final design criteria as well as proper characterization of any unsuitable fill materials in reservoir areas for disposal.

The geological and geotechnical investigations needed for the design and construction of the Project will include field and desktop programs to characterize the surface and subsurface geological conditions at potential areas of concern. These include dam foundations, tunnel alignments, and powerhouse foundation, and are expected to include, but not be limited to:

- Detailed geologic mapping;
- Identification of fault zones;
- Mapping of potential and existing geologic hazards such as landslides and areas subject to potential for liquefaction;
- Subsurface borings, sampling, and testing to determine rock quality for underground facilities; seismic refraction surveys; exploratory trenching;
- Description of seismicity; mapping of soils within the project area; and
- Evaluation of potential borrow sources and suitability of materials for construction.

The results of these investigations will be presented in the license amendment application.

5.1.2 Water Resources

Hydrology

Flow discharge at Oneida Dam is established in the Project License Articles, which include Articles 408, 411, 415, and 420. In addition to the License Articles, PacifiCorp must manage flow in a way that ensures water rights downstream of the Reservoir will be met, according to state law. Water elevation in Oneida Reservoir is maintained at a fairly constant elevation throughout most of the year (within 4 feet).

These existing flow regulations for Oneida Dam and the Bear River would continue if the proposed Oneida Pumped Storage Facility is approved. Downstream water rights would be met. No further study or information gathering is necessary to support this conclusion.

Water Quality

As discussed in section 4.3.2.2, water quality data collection in the Bear River upstream and downstream of the Oneida Development, and particularly in Oneida Reservoir itself, has been sporadic. As a result, there is not a sufficient baseline for assessment of the effects of the Oneida Pumped Storage Facility.

The proposed Project would alter the magnitude of surface-level fluctuation in Oneida Reservoir, increase turbulence in the reservoir associated with inflows from the upper reservoir, and mix water from the upper reservoir into the existing reservoir. These changes could affect turbidity, temperature, and several other water quality parameters. Preliminary consultation with IDEQ suggested adding metals analyses to the sediment sampling component of the water quality study.

Further study is necessary to develop a sound baseline model for impact assessment, provide model input to forecast possible water quality impacts, and assess these impacts relative to applicable water quality standards.

5.1.3 Fish and Aquatic Resources

Movement of water between Oneida Reservoir and the upper reservoir of the proposed Project during pumped/generation operations would increase the potential for fish entrainment and mortality at the Oneida Development. However, as discussed above in section 4.4.2.1, the fish population in Oneida Reservoir consists primarily of non-native, warm-water sport fish, stocked by IDFG to create angling opportunities, and carp. As previously noted, Bonneville cutthroat trout do not occur in the reservoir; therefore, an entrainment study is not needed.

Regarding invertebrates, operation of the proposed Oneida Pumped Storage Facility would increase potential fluctuation in the surface elevation of Oneida Reservoir to 6 feet. Early consultation with IDEQ and IDFG have suggested an invertebrate study would provide additional information on the benthic community in Oneida Reservoir. Invertebrates in the fluctuation zone could be adversely affected. Two factors limit the severity of this potential impact. First, the upper 4 feet of the fluctuation zone have already been affected by ongoing hydroelectric operations. Second, past reservoir studies indicate that only oligochaetes and chironomids occur down to 10 feet water depth (section 4.4.4.1). These are by far the most common invertebrates in the reservoir, and an incremental reduction in their population is not a concern. Nonetheless, PacifiCorp anticipates additional consultation with IDEQ and IDFG regarding sampling invertebrates within Oneida Reservoir through the formal study planning process after the Joint Agency Meeting.

Regarding fish populations in the reservoir and upstream and downstream of Oneida Reservoir, IDFG hosted an informal meeting on July 19th, 2023, to discuss fisheries concerns with the proposed Oneida Pumped Storage Facility and the Bear River Projects. Following the meeting a fisheries study outline was provided to IDFG to gather baseline line information for potential

impacts associated with the Oneida Pumped Storage Facility. IDFG responded with a proposal for additional fisheries evaluations to be included in the amendment to the Bear River Settlement Agreement on August 14th, 2023. A copy of the fisheries study plan and IDFG's response with a proposal for additional fisheries evaluations is provided as Appendix E.

Based on these considerations, there is a need for further consultation and study plan development or data gathering to address fish and aquatic resources. PacifiCorp anticipates continued consultation and preparation of a formal study plan will be developed with IDFG after the JAM.

5.1.4 Wildlife and Botanical Resources

Upland Habitat

Construction and operation of the pumped storage infrastructure could have a range of adverse effects on upland habitats in the Oneida Development project area and thus on the plant and wildlife species associated with habitats identified in section 4.5.1 and thus on the general and special-status wildlife species associated with those habitats:

- Construction of the upper reservoir, flowline, penstock, powerhouse, and access roads could permanently convert and fragment sagebrush steppe, maple woodland, and riparian woodland habitats. High levels of human activity and noise during construction could temporarily displace wildlife from these and adjacent habitat types, including during sensitive periods such as breeding, migration, and wintering.

- Ongoing operations of the Oneida Pumped Storage Facility (e.g., presence of humans, noises) could maintain these impacts permanently but at a lower intensity than during construction.

Additional study is needed to determine the extent, severity, and timing of these potential upland habitat effects.

Invasive Species and Noxious Weeds

Construction of the pumped storage infrastructure could result in the introduction and/or spread of invasive plant species and noxious weeds in the project area associated with the Oneida Development through several mechanisms:

- Construction would leave areas of bare soil open to invasion by invasive or weedy species already occurring in adjacent habitats (section 4.5.2).

- Construction equipment and vehicles may bring seed of new invasive or weedy species onto the site from other locations.

- Construction activities could promote the spread of seed from either source across the site.

Additional study is necessary to identify invasive and weedy plant populations currently in the Project and pumped storage areas to assess the potential for spread of these species, and to identify measures to manage introduction and spread of undesirable plant species.

5.1.5 Wetlands, Riparian, and Littoral Habitat

Construction and operation of the proposed Oneida Pumped Storage Facility could have a range of adverse impacts on wetlands, riparian and littoral habitats throughout the Oneida Development and upper Oneida Reservoir area. Direct impacts from constructing could include the conversion of these habitats into the infrastructure itself. Operational impacts of pumping water between the lower and upper reservoir and generation could have impacts to riparian and littoral habitat in the Oneida Reservoir. Desktop analysis showed that very few wetlands exist in and around the Project's upper reservoir. This desktop analysis will be confirmed with field visits (as outlined in the Wetland Study Plan in Appendix D) to understand the areal extent of any existing wetlands and potential impacts.

5.1.6 Rare, Threatened, and Endangered Species

Federally Listed Species

Construction and operation of the pumped storage infrastructure, as described above in section 3.0, could have a range of adverse effects on the federally listed species listed in Table 4.7-1, including:

- Construction of the upper reservoir, flowline, penstock, powerhouse, and access roads could kill or displace species and permanently destroy habitat required by federally listed species. High levels of human activity and noise during construction could temporarily displace wildlife from these and adjacent habitat types, including during sensitive periods such as breeding, migration, and wintering.

- Ongoing operations of the pumped storage project could maintain these impacts permanently but at a lower level.

- Changes in hydrology related to the operation of the proposed Oneida Pumped Storage Facility.

Desktop analyses showed that the North American wolverine does not have suitable habitat occurring within the Project area (USFWS, 2018), and therefore, there are no Project threats to it. Monarch butterflies may occur within the Project area, and the primary threats to monarchs include habitat loss, in the form of destruction of milkweed plants, loss of nectar-producing flowers, and application of chemical herbicides and pesticides. Ute ladies'-tresses may have potential habitat in the Project area along streams and in wetlands. Surveys will be conducted to assess the quality of the potential habitat and to determine if it is occupied. Potential effects from the project could include changes in hydrology related to the operation of the pumped storage project.

Additional studies are needed to determine the extent, severity, and timing of these potential impacts on federally listed species.

Bald and Golden Eagles

Construction and operation of the pumped storage infrastructure could have a range of adverse effects on the eagles listed in section 4.7.2, including:

- Eagles may avoid or abandon nests in the area if construction occurs during nesting periods. Bald and golden eagles have been shown to avoid construction activity either temporally or spatially (Stangl, 1994).

- Increased human presence and other construction activities have the potential to disturb nesting eagles to a degree that may result in nest failure.

- Loss of habitats and the species associated with them, as described above, may reduce prey resources for eagles.

Additional studies are needed to determine the extent, severity, and timing of these potential impacts to bald and golden eagles.

Rare Species

Construction and operation of the pumped storage infrastructure could have a range of adverse effects on rare species listed in section 4.7.3, including:

- Construction of the upper reservoir, flowline, penstock, powerhouse, and access roads could kill or displace species and permanently destroy habitat required by rare wildlife species. High levels of human activity and noise during construction could temporarily displace wildlife from these and adjacent habitat types, including during sensitive periods such as breeding, migration, and wintering.

- Disturbance to species from Project construction and operation.

- Water level fluctuations, which may alter habitat and inundate bird nests and amphibian eggs.

- Ongoing operations of the proposed Oneida Pumped Storage Facility could maintain these impacts permanently but at a lower level.

Additional studies are needed to determine the extent, severity, and timing of these potential impacts to rare species.

BLM Special Status Plant Species

Construction and operation of the proposed Oneida Pumped Storage Facility infrastructure could have adverse effects on BLM Special Status Plant species listed in section 4.7.5, including, construction of the upper reservoir, flowline, penstock, powerhouse, and access roads. These activities could affect BLM Special Status plant species if they are present in areas that are affected by project elements. Surveys will be conducted to access habitat suitable and presence in the Project areas for these species.

5.1.7 Recreation and Land Use

The Oneida Pumped Storage Facility could potentially impact existing recreation resources during construction and operations in the following ways:

- Boat ramps, campsites, and other recreational facilities could be impacted by fluctuating water levels in Oneida Reservoir.

- Fishing opportunities in the reservoir and the river downstream could be affected by water quality changes.

- Hunting opportunities in the development area and the upper reservoir and flowline sites could be affected by any habitat impacts and associated effects on game populations. Access could also be affected by construction and operation of proposed infrastructure.

Project construction and operation also has some potential to impact livestock and grazing allotments in the vicinity of the development area. Impacts on grazing allotments could include loss of grazing areas due to construction and disturbance to livestock from noise and increased traffic along the access roads. However, given the scale of grazing allotments relative to the areas of potential impact, these effects would not be substantial.

Huntable populations of big game and upland birds (section 4.5.3) could be negatively impacted by Project construction and operation. Potential impacts on game species would parallel those discussed above under Upland Habitats for wildlife species at large. Habitat loss and fragmentation due to Project construction, operation, and infrastructure may reduce populations of game species or cause them to temporarily or permanently vacate the Oneida Development and Project areas. Additional study is needed to assess the potential extent and severity of these potential effects on game species.

Based on these considerations, additional studies are needed to determine the extent, severity, and timing of the potential impacts on recreation resources, but land use requires no further study or data collection.

5.1.8 Aesthetics and Visual Resources

The Oneida Pumped Storage Facility could potentially impact visual resources during construction and operations in the following ways:

- Visitors to public places such as roads, day use areas, campgrounds, and Oneida Reservoir could experience audible construction noises and new infrastructure construction (and associated impacts like dust) albeit temporary; and

- Boaters and visitors to the shoreline could experience evidence of operation of the proposed Oneida Pumped Storage Facility by witnessing exposed shorelines during the lowering and filling of the existing Oneida Reservoir.

Based on these considerations, additional study is needed to determine the extent, severity, and timing of the potential impacts to visual resources.

5.1.9 Cultural Resources

The primary issue related to cultural resources is a data gap for large portions of the study area for the pumped storage facilities. The majority of the study area, particularly that of the proposed upper reservoir, have never been surveyed for the presence or absence of cultural resources.

5.1.10 Tribal Resources

The primary issue related to resources of Tribal concern is a data gap for large portions of the study area for the pumped storage facilities. The majority of the study area, particularly that of the potential upper reservoir, have never been surveyed for the presence or absence of cultural resources or other resources that may be of concern to affiliated Tribes, and PacifiCorp is not aware of any specific consultation that has occurred with said Tribes regarding potential resources of concern in the bulk of the pumped storage study area. PacifiCorp's past consultation with the Tribes, while extensive, did not address the area of the proposed upper reservoir.

5.1.11 Socioeconomic Resources

The primary issue related to socioeconomic resources is the creation of new construction jobs associated with building the proposed Oneida Pumped Storage Facility.

5.2 POTENTIAL STUDIES OR INFORMATION GATHERING

This section identifies potential studies or information gathering that may be needed to analyze the preliminary resource issues identified in section 5.1. Study planning for the Oneida Pumped Storage Facility began prior to preparation of this ICD. In late 2022, PacifiCorp initiated study planning for the Oneida Pumped Storage Facility in response to three objectives:

- To provide resource input for the preliminary project design process.
- To secure early involvement of the agencies and other stakeholders who make up the Collaborative Group organized for this project.
- To initiate studies as soon as possible, taking advantage of the 2023 field season.

Based on resource concerns recognized at the time, PacifiCorp produced draft study plan submitted to the Collaborative Group for initial review in April 2023. Study plans were prepared for wetlands, shoreline erosion, water quality, wildlife, federally listed plant and animal species, recreation, aesthetics, and cultural resources. Each outline noted that a comprehensive study plan would be prepared based on Collaborative Group review and input on the study scope and methodology, and that the revised plans would be included in the ICD. However, given additional informations identified, PacifiCorp anticipates the revised plans would be prepared and provided for review after the Joint Agency Meeting. The Collaborative Group will be invited to review and comment on the ICD, including study plans.

Since the draft study plans were prepared, several factors in addition to Collaborative Group input emerged that affected study plan development, including changes in preliminary project design, results of initial desk-top and field work, and FERC study requirements. These factors framed the resource descriptions in section 4 of this ICD and the issues identified in section 5.1.

Reflecting these considerations, this section summarizes the main elements of the previously prepared study plan and identifies the factors driving development of the future study plans after the Joint Agency Meeting. Depending on the resource, changes to distributed study plans may involve study objectives, study scope, or study methods.

Note that some of the biological resource headings below do not match either the original study plan s or the headings in ICD sections 4 and 5.1. To reflect the way the actual studies will be completed, the plant and wildlife related issues requiring further study identified in section 5.1 are divided into two study plans prepared and implemented by botanists and wildlife biologists, respectively.

5.2.1 Geology and Soils

There are two types of studies anticipated with developing the Oneida Pumped Storage Facility: (1) geotechnical borings to inform the civil and structural designs of the new dam, penstocks, and powerhouses; and (2) shoreline erosion. The geotechnical borings are proposed as a future activity as late as potentially after FERC approvals for the Project are secured to inform the design. The shoreline erosion study was circulated as part of the Draft Study Plan. A copy of which is included in Appendix D.

The goal of the study is to identify and characterize areas of erosion along Oneida Reservoir shoreline to inform site-specific erosion monitoring, if needed. To achieve these goals, the study has the following objectives:

- Conduct desktop mapping to characterize existing land types, practices, and soils within 100 meters of the existing shoreline;
- Conduct a field survey to map existing bank conditions and determine the locations of existing areas of erosion along the reservoir shoreline;
- Produce an updated map or series of maps that illustrate the current shoreline condition and adjacent land-use practices;
- Characterize the processes of erosion (e.g., slumping, slip) for those areas of erosion identified in Objective 2; and,
- Discuss the likely causes of shoreline erosion (e.g., high flow, ground water seepage, surface-runoff, livestock grazing, boat wakes/wave action, water level fluctuations).

The goals and objectives of the study have not changed, and no comments have been received to adjust the study at this time. For this reason, the study plan is planned to be implemented in fall of 2023 after Labor Day.

5.2.2 Water Quality

The goals stated in the original water quality study were to (1) collect updated baseline water quality information in Oneida Reservoir and the Bear River to document existing water quality conditions in the Project area; (2) assess effects on water quality parameters of concern resulting from water exchange between the upper and lower reservoirs and potential mobilization of

sediments; and (3) determine whether potential impacts would violate IDEQ surface water quality standards. To reach these goals, the study had the following objectives:

- Collect continuous temperature data near the dam in Oneida Reservoir and immediately upstream and downstream of the reservoir in the Bear River (above Cottonwood Creek near Highway 34 and in Oneida Narrows downstream of the Oneida powerhouse, respectively). Data will be used to update baseline conditions.

- Collect dissolved oxygen (DO) and turbidity data in Oneida Reservoir, with vertical profiles at two reservoir sites (near the dam and mid-reservoir) and upstream and downstream of the reservoir in the Bear River at the sites noted above. Data will be used to update baseline conditions.

- Collect TSS and TP in Oneida Reservoir at the two proposed sites at three depths: surface, middle depth, bottom, and at the noted upstream and downstream in the Bear River sites. Data will be used to update baseline conditions.

- Collect shallow sediment cores at the inflow area of Oneida Reservoir to characterize sediment deposits (sediment structure, particle size, and phosphorus concentration). Data will be used to define sediment composition.

- Assess the existing bathymetry and bed-elevation models of Oneida Reservoir and determine if updated information is necessary.

- Assess the baseline water quality conditions relative to applicable IDEQ surface water quality standards and designated uses.

The goals and objectives of the study have not changed. One scope change has been made at IDEQ request; heavy metals have been added to the analysis of sediment cores (Objective 6). Beyond that, based on IDEQ review of the initial study overview and desk top review of existing information, the methods to be employed in addressing the second goal and the fifth objective have been revised.

Regarding the goal of assessing the effects on water quality parameters of concern resulting from water exchange between the upper and lower reservoirs and potential mobilization of sediments, a hydraulics model will be constructed. That model will require bed-elevation data, and review of available information showed that new data would be required to complete the hydraulic modeling. The hydraulic model will allow PacifiCorp to more fully incorporate water quality effects into their evaluation of various pumped storage operating scenarios, as well as identifying potential compliance issues with state water quality standards. The study plan for the hydraulic model is anticipated to be prepared after the Joint Agency Meeting and would provide more detail on data collection and impact assessment methods.

Aside from these revisions, the water quality study plan has not substantively changed.

5.2.3 Botanical Resources

The goals stated in the original study were (1) to determine whether Ute ladies'-tresses orchid, federally listed as threatened, occurs in the Project area and to what extent Project construction and operation would affect the species, (2) establish a noxious weed baseline inventory of the study area, and (3) assess the potential for introduction and/or spread of noxious weeds. To accomplish these goals, the study had the following objectives:

- Systematically identify and survey areas of potential suitable habitat within the Project area to determine if and where Ute ladies'-tresses occurs.
- Assess potential direct or indirect effects on this species resulting from Project construction and operations.
- Identify any noxious weed populations occurring in the Project area and document their location and extent.
- Overlay the weed inventory with the Project disturbance footprint to assess potential for weed introduction and spread.

The objectives of the study have been expanded to include invasive species as well as noxious weeds, based on standard FERC procedure.

In response to BLM input, the scope of the study has been expanded to include the six BLM special-status species potentially occurring in the Project area.

In terms of methods, the current USFWS Ute ladies'-tresses protocol has been adopted. It calls for 3 years instead of 2 years of survey if suitable habitat is identified but the species is not found. The revised study plan to be prepared after the Joint Agency Meeting would provide more detail on data collection and impact assessment methods.

Aside from these revisions, the botanical resources study plan has not substantively changed.

5.2.4 Wetlands

The goal of the wetland/waterbody study is to advance the understanding of the types, quantity, and distribution of features present in the area of the pumped storage facilities and within the Oneida Reservoir/Bear River proper to better evaluate potential impacts from the Oneida Pumped Storage Facility. To accomplish this goal, the study had the following objectives:

- Collect all related data/imagery/mapping/field data of relevant resources in the vicinity of the Project area (i.e., NWI, NHD, IDFG, PacifiCorp, other).
- Conduct a U.S. Army Corps of Engineers field Waters of the US (WOTUS) delineation of lands within the proposed Project Boundary for the Oneida Pumped Storage Facility. The delineation would include:
    - A terrestrial-based field component to map the proposed upper reservoir area (~65 ac), the pumping/generation station location (~0.5 ac), and any areas of inter-connection and /or access as required (unknown acreage at this time).

- An aquatic-based field survey on the Oneida Reservoir using a boat, or boats, to access all the areas immediately along both reservoir shorelines within the defined Project Boundary.
- Create legally defensible jurisdictional wetland mapping products and field data to support a FERC License capacity amendment application as well as provide mapping and data to support any future Clean Water Act Section 404/401 and/or State wetland permitting actions.

The study addresses potential impacts to wetlands and the study area. The objectives of the study plan are unchanged. The schedule to implement the wetlands study is proposed to occur after Labor Day 2023.

5.2.5 Wildlife Resources

The goal stated in the original study was to determine if wildlife species including special status species, species of high public interest, and general wildlife species potentially occur in the Project area. To accomplish this goal, the study had the following objectives:

- Categorize and map habitat types in the Project area.
- Determine if habitat for special status species and species of high public interest exist;
- Identify any observations of special status species in the Project area;
- Determine if potential direct or indirect impacts would occur on special status species, species of high public interest, and general wildlife species resulting from Project construction and operation.

The study addressed impacts on special status species, species of high public interest, and general wildlife.

The objectives of the study plan in Appendix D remain essentially the same. The study scope has been refined, however, in the following ways:

- Canada lynx (Threatened) and North American wolverine (Proposed Threatened) have been eliminated from the study because initial review indicated that no suitable habitat occurs in the Project area.
- The SGCN species included in the study have increased to include several Tier 3 species in addition to Tier 1 and 2 species at the request of IDFG.
- Habitat impacts have been adopted as a proxy for impacts on wildlife as they can be more objectively assessed.

Regarding study methods, due to the inherent difficulties in determining occupancy for special status species, this study will drop point-count or other field surveys and focus on previously collected occupancy data coupled with habitat suitability surveys. Desktop analyses will be performed to identify the locations of known observations of these species in the vicinity of the

Project area, using a robust species observation dataset from IDFG. Additionally, desktop analyses will identify specific habitat requirements for each species. Habitat suitability field surveys will be performed in the Project area to determine if suitable habitat occurs in the Project area. If there are both observations in the vicinity and suitable habitat within the Project area, then species will be assumed to be occupying the Project area.

The revised study plan to be prepared after the Joint Agency Meeting provides more detail on species-specific data collection and impact assessment methods.

Aside from these revisions, the wildlife study plan has not substantively changed.

5.2.6 Recreation

The goals stated in the original study overview were to evaluate potential effects of the pumped storage construction and operations on (1) recreational facilities that could be impacted by fluctuating water levels in Oneida Reservoir, (2) fishing opportunities in the reservoir and the river downstream, and (3) hunting opportunities at the site of the proposed upper reservoir, flowline corridor connected to the penstock and shoreline areas of Oneida Reservoir. To achieve these goals, the study overview stated the following objectives:

- Evaluate change in water surface elevation from pumped storage operating scenarios at boat launch facilities to assess potential impacts on boater access.
- Identify areas where lower surface elevations might expose boaters to submerged or exposed hazards or otherwise limit boating on the reservoir.
- Determine if bank erosion impacts would affect campgrounds or other recreation sites on the reservoir shoreline or the river downstream.
- Assess potential impacts on the recreational fisheries in the reservoir and downstream river area from project construction and operations.
- Identify potential impacts on hunting opportunities due to loss of wildlife habitat and game species, as well as access to hunting areas.

The objectives, scope, and methods for this study have changed as a result of PacificCorp's consideration of pursuing a license term extension for the Bear River Project. Recreation is one of the main issues concerning the counties involved and the federal and state agency stakeholders, and this study provides an opportunity to gather information on other Bear River Project recreation facilities.

Accordingly, the study has been revised to include a new objective and resulting scope change – to assess use levels and facility conditions at all PacifiCorp recreation facilities associated with the Soda, Grace, and Oneida developments. In terms of methods, this will entail traffic counts and visitation estimates at these facilities, as well as facility inventories and condition assessments.

Other considerations include catch rates at Oneida Reservoir and angler experience with access and use of the Reservoir fishing opportunities and resources. Accordingly, the methods to be employed in addressing the second goal and the fourth objective have been revised to include fisherman surveys.

The revised study plan to be prepared after the Joint Agency Meeting would provide more detail on data collection and impact assessment methods.

5.2.7 Aesthetics

The proposed study would obtain information needed to determine the potential degree of visibility and visual contrast of existing and proposed structures that compose the proposed Oneida Pumped Storage Facility, operations and maintenance, and recreation use in relationship to the Oneida Canyon vicinity aesthetic resources. The study goals include: (1) develop an inventory of the area aesthetic resources or landscape character; (2) review and summarize applicable visual management policies for the area; (3) assess the visual contrast between the proposed features and surrounding landscape; and (4) prepare visual simulations of the proposed pumping/generating station, penstock and new upper reservoir, including access roads and transmission lines.

No comments have been received to suggest modifications to the study at this time.

5.2.8 Cultural and Tribal Resources

The goal of this study is to collect information on historic properties (i.e., cultural resources listed on or determined eligible for listing on the National Register) and resources of tribal concern on lands within the proposed project area potentially impacted by construction and operation of the proposed Oneida Pumped Storage Facility to facilitate the evaluation of effects from project operation and maintenance activities on such identified resources under an amended license and to ensure compliance with the National Historic Preservation Act and its implementing regulations at 36 CFR § 800. To accomplish this goal, the study has the following objectives:

- Consult with Idaho State Historic Preservation Office (ISHPO), Native American Tribes, and other consulting parties to define the area of potential effects (APE);
- Conduct an intensive-level pedestrian survey of previously unsurveyed uplands to locate and document cultural resources within the footprint of potentially impacted lands—a survey of lands within the drawdown zone for the reservoir and around the powerhouse and related facilities already was previously completed;
- Consult with the ISHPO, participating Native American Tribes, and other parties as appropriate to evaluate the National Register of Historic Places (National Register) eligibility all new cultural resource sites documented within the APE according to 36 CFR § 800.4.
- Consult with the ISHPO, participating Native American Tribes and other parties as appropriate, to determine existing and potential project effects on the eligible cultural resources located and identified within the APE in accordance with 36 CFR § 800.5.

The goals and objectives of the study have not changed, and no comments have been received to adjust the study at this time. For this reason, the study is planned to be implemented in 2024.

5.3 RELEVANT COMPREHENSIVE WATERWAY PLANS AND RESOURCE MANAGEMENT PLANS

Section 10(a)(2)(A) of the Federal Power Act (FPA), 16 USC § 803(a)(2)(A), requires FERC to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway affected by the project.

FERC Order No. 481-A, issued on April 27, 1988, established that FERC will accord FPA Section 10(a)(2)(A) comprehensive plan status to any federal or state plan that:

- Is a comprehensive study of one or more of the beneficial uses of a waterway or waterways;
- Specifies the standards, the data, and the methodology used; and
- Is filed with the Secretary of the Commission.

FERC's most recent list of comprehensive plans was published in August, 2022. Based on this list 57 comprehensive plans are available for the State of Idaho, of which, 19 are likely relevant to the project:

- BLM. 2012. Pocatello Resource Management Plan. Pocatello, ID. April 2012.
- BLM. 2015. Record of Decision and Approved Resource Management Plan for the Great Basin Region, Including the Greater Sage-Grouse Sub-Regions of Idaho and Southwestern Montana, Nevada and Northeastern California, Oregon, and Utah. Washington, D.C. September 2015.
- BLM. 2019. Idaho Greater Sage-Grouse Record of Decision and Approved Resource Management Plan Amendment. Boise, Idaho. March 2019.
- Idaho Department of Water Quality. 2018. Water Quality Standards. Boise, Idaho.
- Idaho Department of Fish and Game. 2019. Fisheries Management Plan, 2019-2024. Boise, Idaho. 2019.
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- Northwest Power and Conservation Council. 2010. The Sixth Northwest conservation and electric power plan. Portland, Oregon. Council Document 2010-09. February 2010.
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- Northwest Power and Conservation Council 2020. 2020 Addendum to the 2014 Columbia River Basin Fish and Wildlife Program. Portland, Oregon. Council Document 2020-9. October 2020.
- Northwest Power and Conservation Council. 2022. The 2021 Northwest Power Plan. Portland, Oregon. Council Document 2022-03. February 2022.
- U.S. Fish and Wildlife Service. n.d. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Washington, D.C.

6.0 STATEMENT OF PUBLIC UTILITY REGULATORY POLICIES ACT BENEFITS

The Public Utility Regulatory Policies Act of 1978 (PURPA) was enacted following the energy crisis of the 1970s to encourage: (1) conservation of electric energy; (2) increase efficiency; (3) equitable retail rates; (4) development of hydroelectric potential at existing small dams; and (5) conservation of natural gas. PURPA is implemented by the FERC and the states, and imposes mandatory purchase obligations on electric utilities for power generated by cogeneration facilities and small power production facilities of 80 MW or less.

18 CFR § 4.38 (b)(2)(vi)(A) requires a statement (with a copy to FERC) of whether or not the applicant (i.e., PacifiCorp) will seek benefits under Section 210 of PURPA (Public Utility Regulatory Policies Act) by satisfying the requirements for qualifying hydroelectric small power production facilities defined in § 292.203. At this time, PacifiCorp is not seeking benefits under Section 210 of PURPA.

7.0 SUMMARY OF CONTACTS AND CONSULTATION

In the development of this ICD and the draft study plan (see Appendix D), PacifiCorp exercised due diligence, contacted, and conducted informal consultation with most of the Bear River Hydroelectric Project Environmental Coordination Committee, which includes representatives of state and federal resource agencies, non-governmental organizations, and tribes. PacifiCorp also engaged in discussions with adjacent private landowners. Appendix A contains the complete list of interested party contacts PacifiCorp has compiled in preparing this ICD and would receive a copy of this ICD and future documents related to the proposed Oneida Pumped Storage Facility amendment proceeding.

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Appendix A – Interested Parties List

INTERESTED PARTIES LIST

ENVIRONMENTAL COORDINATION COMMITTEE	
Drew Retherford Bureau of Land Management Pocatello Field Office 4350 S Cliffs Dr Pocatello, ID 83204	Hunter Osborne Shoshone-Bannock Tribes P.O. Box 306 Fort Hall, ID 83203
Patrick Kennedy Idaho Dept. of Fish and Game 1345 Barton Road Pocatello, ID 83204	Jim DeRito Trout Unlimited 47 N 300 East Providence, UT 84332
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Charlie Vincent American Whitewater 1800 E 3990 So. Salt Lake City, UT 84124	Nic Nelson Idaho Rivers United P.O. Box 633 Boise, ID 83701
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Andrew Stokes Idaho Dept. of Parks and Recreation PO Box 83720 Boise ID 83720-0065	Dan Miller National Park Service 909 First Avenue Seattle, WA 98104-1060
Open Shoshone-Bannock Tribe P.O. Box 306 Ft. Hall, ID 83203	Kathy Rinaldi Greater Yellowstone Coalition 60 E. Little Ave., Suite 101 PO Box 1072 Driggs, ID 83422
Mary D'Aversa Bureau of Land Management 1405 Hollipark Drive Idaho Falls, ID 83401	Ed Schriever Idaho Dept. of Fish and Game P.O. Box 25 Boise, ID 83707
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Pete Gomben USDA Forest Service 324 25th Street Ogden, UT 84401	Kira Finkler Trout Unlimited 910 W Main St., Suite 342 Boise, ID 83702
Jess Byrne Idaho Department of Environmental Quality 1410 N. Hilton Boise, ID 83706	Frank Lands National Park Service 333 Bush Street, Suite 500 San Francisco, CA 94104-2828
Don Barnett Bear River Commission 106 West 500 South, Suite 101 Bountiful, UT 84010	Todd Adams Utah Div. of Water Resources 1594 W N Temple, Suite 310 Salt Lake City UT 84116
Ann Yribar Idaho State Attorney General's Office P.O. Box 83720 Boise, Idaho 83720-0010	Michael Orr Idaho State Attorney General's Office P.O. Box 83720 Boise, Idaho 83720-0010

Thomas O'Keefe American Whitewater 3537 NE 87th St. Seattle, WA 98115	Dave Cottle Bear Lake Watch P.O. Box 205 St. Charles, ID 23272
Matt Lucia Sagebrush Steppe Land Trust P.O. Box 1404 Pocatello, ID 83204	Matt Coombs Sagebrush Steppe Land Trust P.O. Box 1404 Pocatello, ID 83204
Mark Gamblin Sagebrush Steppe Land Trust P.O. Box 1404 Pocatello, ID 83204	Tom Lucia Sagebrush Steppe Land Trust P.O. Box 1404 Pocatello, ID 83204
David Pacioretty Sagebrush Steppe Land Trust P.O. Box 1404 Pocatello, ID 83204	Aaron Swift Rocky Mountain Elk Foundation 9871 W Alliance Dr Boise, ID 83704
Adam Zaragoza Idaho Dept. of Parks and Rec 5657 E Warm Springs Ave Boise, ID 83716	
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Regional Director U.S. Bureau of Indian Affairs Attn: FERC Coordinator 911 NE 11th Ave Portland, OR 97232-4169	Regional Director U.S. Fish & Wildlife Service Attn: FERC Coordinator 911 NE 11th Ave Portland, OR 97232-4169

Regional Forester 324 25th S Ogden, UT 84401-2310	Forest Supervisor Caribou-Targhee National Forest 1405 Hollipark Dr. Idaho Falls, ID 83401-2100
Gayla J Gough Interregional Hydropower Team 324 25th St. USDA Forest Service Ogden, UT 84401	Pete Gomben USDA Forest Service 925 East 1700 South Salt Lake City, UT 84105
ADJACENT LANDOWNERS	
Lind, Bruce E. & Susan M. 10 Cammack Dr. Soda Springs, ID 83276	Kunz, John H. & Sonya S. 1058 River Rd. Grace, ID 83241
Miller, Ray D. 1071 River Rd. Grace, ID 83241	Eddins, Val G. 1172 Grace Dam Rd. Grace, ID 83241
Jorgensen Family Living Trust 12007 S Reeves Ln. Riverton, UT 84065	Des Estates LLC & TLC of Idaho LC 1265 Cliffside Dr. Logan, UT 84321
High Country Heritage Ranch LLC 133 Tyson Rd. Douglas, GA 31533	Maple Grove Wellness LLC 1399 Richard St. Salt Lake City, UT 84115
Jensen Zane Lewis & Summers Nancilee 1400 W 3200 S. Preston, ID 83263	Larsen Ryan & Larsen Lauralyn 1406 E 1900 N. Logan, UT 84341
L. Simmons Farms LLC 1498 Larsen Rd. Soda Springs, ID 83276	Warner, Lee A & Dianne R 16280 Monache Ct. Apple Valley, CA 93207
Lozier, Patrick A. 1657 Reed Ln. Soda Springs, ID 83276	Cleaveland, Benjamin D. 1676 Ralph Hansen Ln. Grace, ID 83241
Jorgensen, Carl B. 1699 Lloyd Rd. Bancroft, ID 83217	Tedrow, John L. 1742 Fremont St. Santa Clara, CA 95050
Gilbert Farms LLC 1805 Grace Power Plant Rd Grace, ID 83241	Wallin, Ralph W. & Diane C. 1974 Turner Rd. Grace, ID 83241
Williams, Cameron & Janel 1976 Telford Rd. Grace, ID 83241	Loertscher, Matt & Kaitlyn 1998 Turner Rd. Grace, ID 83241
Cook, Vaughn R. & Kathryn C. 2072 Sunflower Ln. Mapleton, UT 84664	Rigby, Robert Lynn & Shaunna L. 215 River Dr. Soda Springs, ID 83276
Moore, Daniel J. & Raeann 2319 Hwy 30 Soda Springs, ID 83276	Murray, Gregory Duane & Dianna Louise 2325 Hwy 30 Soda Springs, ID 83276

Meath, Anthony R. & Linda 2355 Hwy 30 Soda Springs, ID 83276	Sweers, Leslie R. & Mary K. 2463 Hwy 30 Soda Springs, ID 83276
Bct Property, LLC 2613 W 2275 N. Farr West, UT 84404	Gunnell, Owen W. & Gaye 30 N 3Rd E. Soda Springs, ID 83276
Nielsen, R. Troy & Brenda 470 S Spring Creek Dr. Soda Springs, ID 83276	Utah Power & Light 509 S 2 E. Preston, ID 83263
Olson Lucas 5225 N Oneida Narrows Rd. Preston, ID 83263	Johnson, Norman K. Etux 95 River Rd. Grace, ID 83241
Harris, Don B. c/o Jeremy Harris PO Box 45 Preston, ID 83263	Gunnell, Dean E. & Karleen L. Family Trust c/o Kent Gunnell 114 E 600 S. Burley, ID 83318
Heritage Leasing Company LLC c/o R Troy Neilsen 470 Spring Creek Dr. Soda Springs, ID 83276	Wilker, E. Arlene Trust PO Box 114 Grace, ID 83241-0000
Stepleton Randal E & Linda J PO Box 117 Grace, ID 83241	RNR Enterprise PO Box 134 Grace, ID 83241
Sagebrush Steepe Rec Land Trust Inc. PO Box 1404 Pocatello, ID 83204	Dehl, Curtis PO Box 199 Soda Springs, ID 83276
Spencer, Cody & Marla PO Box 273 Grace, ID 83241	Coombs, Ronald W. & Carla Lou S. PO Box 551 Grace, ID 83241
Soda Springs Golf Club Inc. PO Box 567 Soda Springs, ID 83276	Bollar, J. Victor & Laurie Ann PO Box 58 Soda Springs, ID 83276
Miles, Everett D. & Pauline S. PO Box 583 Grace, ID 83241	Johnston, Sandra PO Box 665 Soda Springs, ID 83276
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Appendix B – Current Licensed Project Boundary (Oneida Development)

Project Boundary Description

Coordinates are UTM Zone 12, NAD 83, meters. Bearings and Distances are NAD 83 Idaho State Plane East, U.S. Survey Feet (Grid).

Point	Northing	Easting	Bearing	Distance (ft)	Description
1	4682078.9	439835.5			BEG at the INTX of the HWL & S 1/16-Line S13-T13S-R40E
			N.89°39'30"E	59.01'	Along the S 1/16-Line S13-T13S-R40E
2	4682078.8	439850.8			INTX of S 1/16-Line S13-T13S-R40E and 20' E'LY offset of Oneida Rd. CL
					Along 20' E'LY offset of Oneida Rd. CL
3	4680478.8	438706.6			INTX 20' E'LY offset of Oneida Rd. and S 1/16-Line S23-T13S-R40E
			S.89°21'08"E	802.49'	Along the S 1/16-Line S23-T13S-R40E
4	4680472.7	438951			S 1/16 Cor S23/24-T13S-R40E
			S.00°59'06"E	1,327.77'	Along E Line S23-T13S-R40E
5	4680068.1	438952.4			Sec Cor 23/24/25/26-T13S-R40E
			S.00°00'11"W	1,327.58'	Along E Line S26-T13S-R40E
6	4679663.7	438946.9			N 1/16 Cor S25/26-T13S-R40E
			N.89°09'18"W	1,315.03'	Along the N 1/16-Line S26-T13S-R40E
7	4679675.1	438546.3			NE 1/16 Cor S26-T13S-R40E
			S.00°00'08"W	663.31'	Along E 1/16 Line S26-T13S-R40E
8	4679473.0	438543.5			C-N-NE 1/64 Cor S26-T13S-R40E
			N.89°08'02"W	657.51'	Along S-N 1/16 Line S26-T13S-R40E
9	4679478.7	438343.3			SW-NE 1/64 Cor S26-T13S-R40E
			S.00°00'06"W	663.21'	Along W-E 1/16 Line S26-T13S-R40E
10	4679276.7	438340.5			C-W-E 1/64 Cor S26-T13S-R40E
			S.00°00'06"W	644.36'	Along W-E 1/16 Line S26-T13S-R40E
11	4679080.4	438337.8			NW-NE 1/64 Cor S26-T13S-R40E
			N.89°23'27"W	657.47'	Along N-S 1/16 Line S26-T13S-R40E
12	4679085.2	438137.5			C-N-S 1/64 Cor S26-T13S-R40E
			S.00°00'05"W	1,943.07'	Along the N-S 1/4 Line S26-T13S-R40E
13	4678493.2	438129.4			1/4 Cor S26/35-T13S-R40E
			S.00°01'16"E	1,351.61'	Along the N-S 1/4 Line S35-T13S-R40E
14	4678081.4	438123.6			C-N 1/16 Cor S35-T13S-R40E
			S.89°50'52"W	1,316.25'	Along the N 1/16 Line S35-T13S-R40E
15	4678085.8	437722.6			NW 1/16 Cor S35-T13S-R40E
			S.00°04'52"E	1,349.96'	Along the W 1/16 Line S35-T13S-R40E
16	4677674.6	437716.4			C-W 1/16 Cor S35-T13S-R40E
			S.00°04'53"W	2,695.47'	Along the W 1/16 Line S35-T13S-R40E
17	4676853.3	437704			W 1/16 Cor Sec 35/02-T13/14S-R40E
			S.00°18'21"E	2,655.65'	Along the W 1/16 Line S02-T14S-R40E
18	4676044.2	437697.2			C-W 1/16 Cor S02-T14S-R40E
			S.89°38'22"W	505.40'	Along the E-W 1/4 Line S02-T14S-R40E
19	4676045.3	437546.1			INTX of E-W 1/4-Line S2-T14S-R40E and 200' E'LY Offset of HWL
					Along 200' E'LY Offset of HWL
20	4676013.5	437415.6			INTX of 200' E'LY Offset of HWL and 20' E'LY offset of Oneida Rd. CL
					Along 20' E'LY offset of Oneida Rd. CL
21	4675978.6	437357.8			INTX of 20' E'LY offset of Oneida Rd. CL and 200' E'LY Offset of HWL
					Along 200' E'LY Offset of HWL
22	4675661.3	436694.6			END Course along 200' E'LY Offset of HWL
			N.48°40'24"W	189.85'	
23	4675700.1	436651.7			Point on 20' SW'ly offset of Oneida Road Bridge CL
			N.65°22'11"W	114.39'	Along 20' SW'ly offset of Oneida Road Bridge CL
24	4675715.0	436620.2			INTX of 20' SW'ly offset of Oneida Road Bridge CL and W'ly HWL
					Along W'ly HWL
25	4673650.5	435556.4			INTX of W'ly HWL and N Line S16-T14S-R40E
			S.88°29'26"E	382.21'	Along N Line S16-T14S-R40E
26	4673645.8	435672.7			Sec Cor 09/10/15/16-T14S-R40E
			S.00°02'14"W	1,867.98'	Along E Line S16-T14S-R40E
27	4673076.7	435664.6			
			N.89°57'46"W	279.84'	
28	4673077.9	435579.3			
			S.31°06'10"W	1,480.80'	
29	4672694.8	435341			
			S.13°08'57"E	2191.24'	
30	4672042.6	435483.9			Point on the S Line S16-T14S-R40E
			S.13°08'57"E	175.95'	
31	4671990.7	435495.3			Point on 20' NW'ly offset of Siphon CL
			S.52°00'04"W	1,050.66'	Along 20' NW'ly offset of Siphon CL
32	4671795.9	435241.1			INTX 20' NW'ly offset of Siphon CL and 16.5' W'ly offset of Oneida Rd. CL
					Along 16.5' W'ly offset of Oneida Rd. CL
33	4672052.8	434979.7			Point on the S Line S16-T14S-R40E
			N.89°37'30"W	488.37'	Along S Line S16-T14S-R40E
34	4672055.8	434831			1/4 Cor S16/21-T14S-R40E
			N.01°06'33"E	2,708.84'	Along N-S 1/4 Line S16-T14S-R40E
35	4672880.8	434858.2			C 1/4 Cor S16-T14S-R40E
			N.00°59'26"E	2,615.92'	Along N-S 1/4 Line S16-T14S-R40E
36	4673677.5	434882.9			1/4 Cor S09/16-T14S-R40E
			S.88°29'26"E	1,866.67'	Along N Line S16-T14S-R40E
37	4673654.7	435451.2			Point on N Line S16-T14S-R40E
			N.39°49'51"E	83.29'	
38	4673674.0	435467.8			Point on 200' W'ly offset HWL
					Along 200' W'ly offset HWL
39	4676170.5	437294.4			INTX 200' W'ly offset HWL and W Line S02-T14S-R40E
			N.00°10'43"W	626.46'	Along W Line S02-T14S-R40E
40	4676361.0	437296.4			INTX W Line S02-T14S-R40E and 200' W'ly offset HWL
					Along 200' W'ly offset HWL

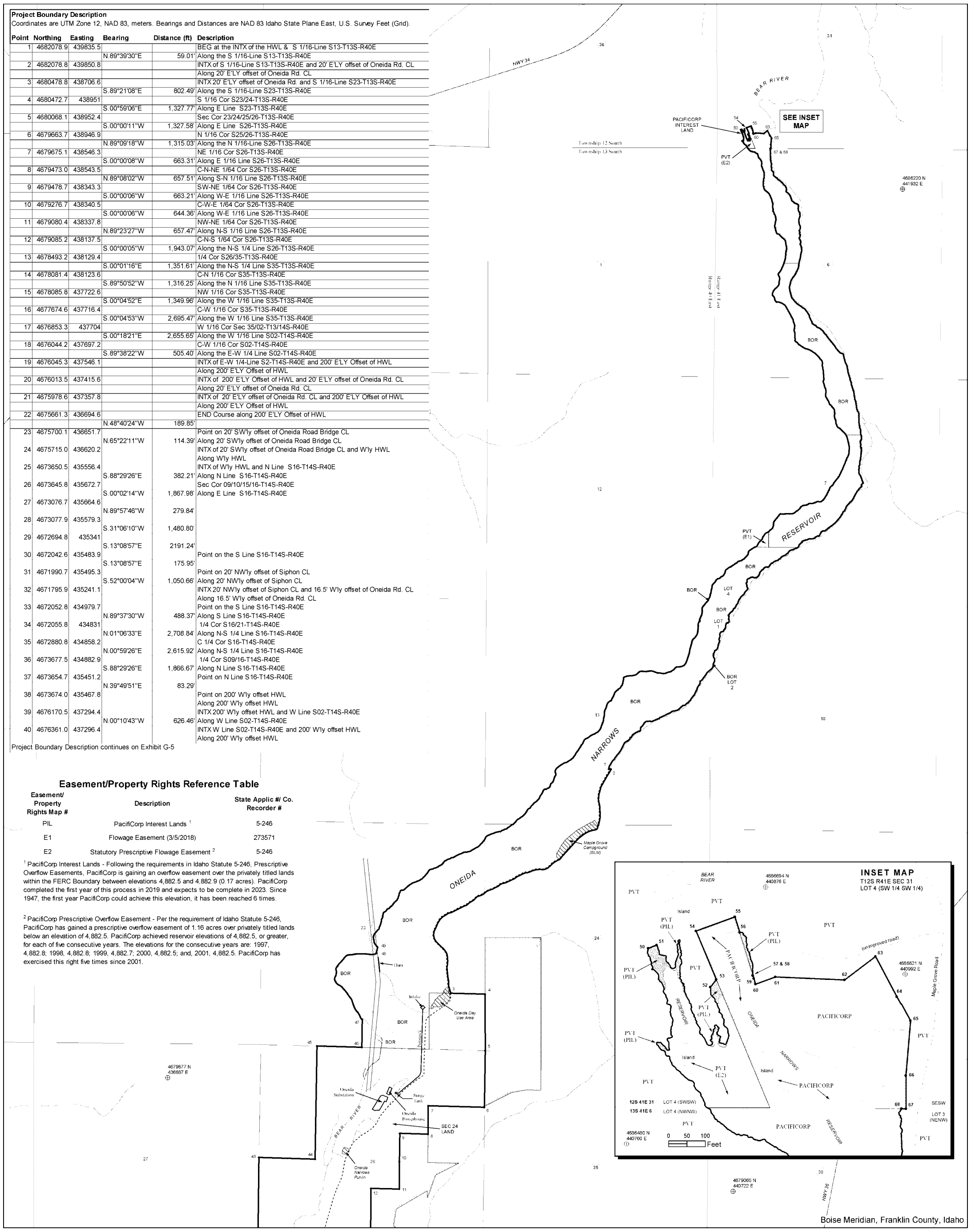
Project Boundary Description continues on Exhibit G-5

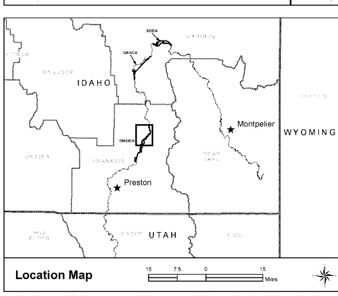
Easement/Property Rights Reference Table

Easement/ Property Rights Map #	Description	State Applic #/ Co. Recorder #
PIL	PacifiCorp Interest Lands [1]	5-246
E1	Flowage Easement (3/5/2018)	273571
E2	Statutory Prescriptive Flowage Easement [2]	5-246

[1] PacifiCorp Interest Lands - Following the requirements in Idaho Statute 5-246, Prescriptive Overflow Easements, PacifiCorp is gaining an overflow easement over the privately titled lands within the FERC Boundary between elevations 4,882.5 and 4,882.9 (0.17 acres). PacifiCorp completed the first year of this process in 2019 and expects to be complete in 2023. Since 1947, the first year PacifiCorp could achieve this elevation, it has been reached 6 times.

[2] PacifiCorp Prescriptive Overflow Easement - Per the requirement of Idaho Statute 5-246, PacifiCorp has gained a prescriptive overflow easement of 1.16 acres over privately titled lands below an elevation of 4,882.5. PacifiCorp achieved reservoir elevations of 4,882.5, or greater, for each of five consecutive years. The elevations for the consecutive years are: 1997, 4,882.8; 1998, 4,882.8; 1999, 4,882.7; 2000, 4,882.5; and, 2001, 4,882.5. PacifiCorp has exercised this right five times since 2001.





Reference Point *
Boundary Point
City
Oneida Road
Paved Road
Graded Road
Transmission Line
Project Boundary
Recreation
PacifiCorp Ownership
PacifiCorp Interest Land
Township/Range
Section
Qtr Qtr Section

* Reference Point coordinates are in UTM Zone 12, NAD 83, meters.

MAP TEXT ABBREVIATIONS:

- BLM = USDI Bureau of Land Management
- BOR = USDI Bureau of Reclamation
- HWL = High Water Line
- LMP = Land Management Plan
- PIL = PacifiCorp Interest Land
- PVT = Private Land
- SEC 24 = Section 24 Reservation Land under Federal Power Act
- (E#) = Easement/Property Rights

BOR lands in the Oneida Canyon are managed by BLM under authority of an "Interagency Agreement Between The Bureau of Reclamation and The Bureau of Land Management, December 1982," signed by both agencies on 3/25/1983.

I hereby state that the project boundary represented on this drawing is developed with reasonable accuracy in accordance with FERC requirements. Data has been developed by PacifiCorp's GIS department from a variety of sources including Federal, State, County, and PacifiCorp GIS sources including orthophotos. No field surveys were conducted. All reasonable efforts have been made to ensure that positional accuracy conforms to National Map Accuracy Standards for maps at 1:24000 scale. Public Land Survey data is approximately located and is based on the Boise Meridian. Property lines are approximately located.

PROFESSIONAL LAND SURVEYOR LICENSED 14107 STATE OF IDAHO JAMES J. COUTS

PROJECT BOUNDARY ACREAGE: ONEIDA DEVELOPMENT

1) TOTAL ACREAGE WITHIN PROJECT BOUNDARY	1595.3 ACRES
2) PACIFICORP LAND	1039.7 ACRES
3) FEDERAL LAND *	562.8 ACRES
4) PRIVATE LAND	2.7 ACRES

* Federal Land includes 9.9 acres of Section 24 lands owned by PacifiCorp.
ABOVE VALUES ARE APPROXIMATE. DERIVED FROM VARIOUS GIS DATASETS.

MAXIMUM FULL POOL ELEVATION (HWL) 4,882.9 FEET

PACIFICORP

PacifiCorp has reviewed the Project boundary shown herein. PacifiCorp either owns in fee simple or possesses the flowage easements* or property rights for all lands drawn on this map that are inside the boundary.

* Flowage easements to be updated in 2023 for 0.17 ac shown as PacifiCorp Interest Lands.

NO	DATE	OLD FERC NO.	DESCRIPTION
4a	08/13/2019	P-20-1039	Easement on submerged private lands. Adjustments using 2017 lidar data and land surveys.
3	06/22/2016	P-20-1030	Order approving Exhibit G with revised federal acres & addition of LMP Conservation Lands
2	10/13/2005	P-20-1021	Drawing numbers and Exhibit G-8 applied as approved in Order
1	12/22/2003		New License Issued

Exhibit G - 4 **Rev 4a**

Bear River Hydroelectric Project, FERC No. 20
License Issued December 22, 2003
Oneida Development
Project Boundary
(Original Drawing Dated September 1999)

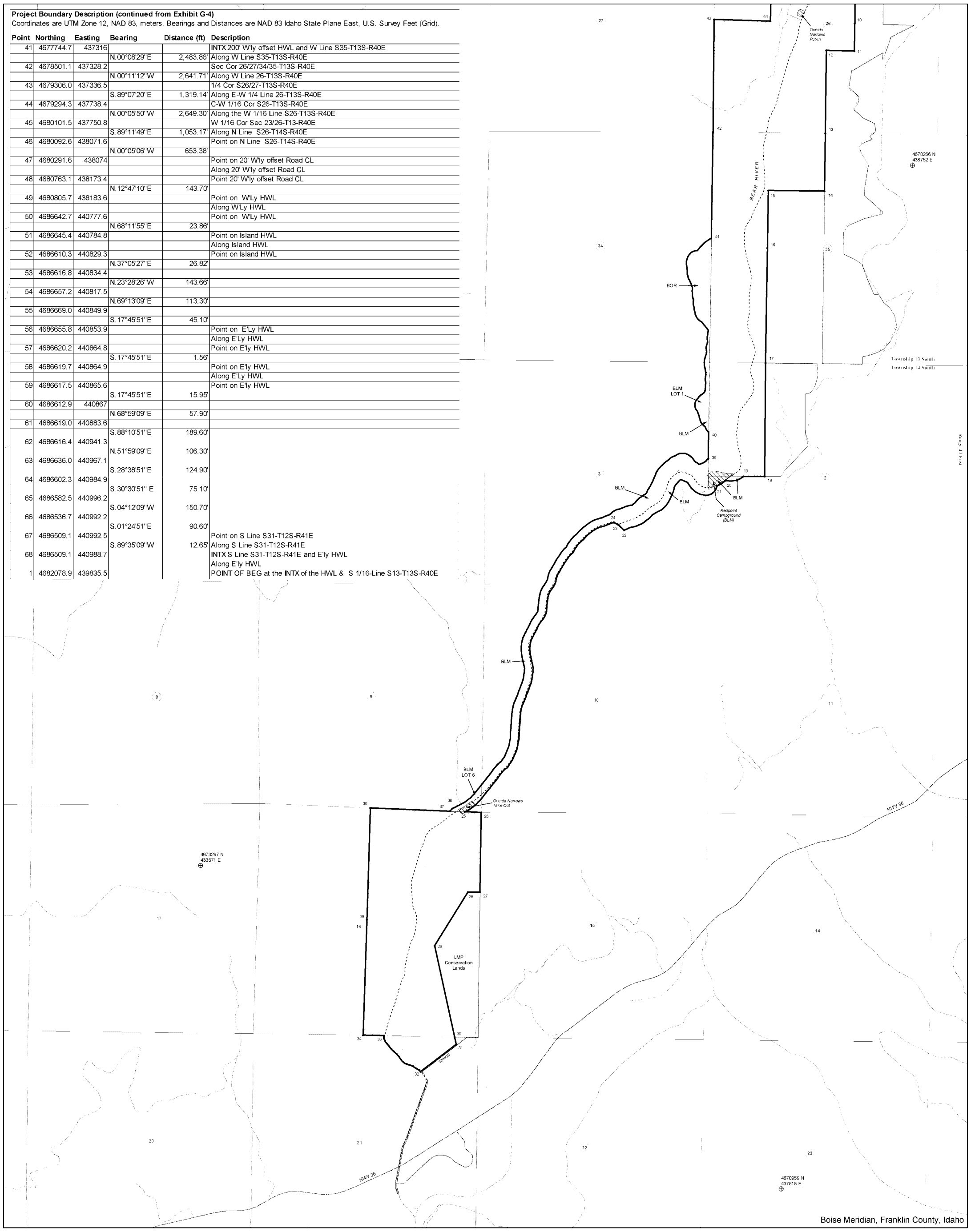
1 inch equals 1000 feet
1,000 500 0 1,000 Feet

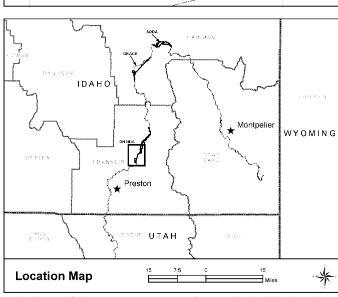
N

FERC Drawing No. P-20-____

Project Boundary Description (continued from Exhibit G-4)
Coordinates are UTM Zone 12, NAD 83, meters. Bearings and Distances are NAD 83 Idaho State Plane East, U.S. Survey Feet (Grid).

Point	Northing	Easting	Bearing	Distance (ft)	Description
41	4677744.7	437316			INTX 200' W'ly offset HWL and W Line S35-T13S-R40E
			N.00°08'29"E	2,483.86'	Along W Line S35-T13S-R40E
42	4678501.1	437328.2			Sec Cor 26/27/34/35-T13S-R40E
			N.00°11'12"W	2,641.71'	Along W Line 26-T13S-R40E
43	4679306.0	437336.5			1/4 Cor S26/27-T13S-R40E
			S.89°07'20"E	1,319.14'	Along E-W 1/4 Line 26-T13S-R40E
44	4679294.3	437738.4			C-W 1/16 Cor S26-T13S-R40E
			N.00°05'50"W	2,649.30'	Along the W 1/16 Line S26-T13S-R40E
45	4680101.5	437750.8			W 1/16 Cor Sec 23/26-T13-R40E
			S.89°11'49"E	1,053.17'	Along N Line S26-T14S-R40E
46	4680092.6	438071.6			Point on N Line S26-T14S-R40E
			N.00°05'06"W	653.38'	
47	4680291.6	438074			Point on 20' W'ly offset Road CL
					Along 20' W'ly offset Road CL
48	4680763.1	438173.4			Point 20' W'ly offset Road CL
			N.12°47'10"E	143.70'	
49	4680805.7	438183.6			Point on W'Ly HWL
					Along W'Ly HWL
50	4686642.7	440777.6			Point on W'Ly HWL
			N.68°11'55"E	23.86'	
51	4686645.4	440784.8			Point on Island HWL
					Along Island HWL
52	4686610.3	440829.3			Point on Island HWL
			N.37°05'27"E	26.82'	
53	4686616.8	440834.4			
			N.23°28'26"W	143.66'	
54	4686657.2	440817.5			
			N.69°13'09"E	113.30'	
55	4686669.0	440849.9			
			S.17°45'51"E	45.10'	
56	4686655.8	440853.9			Point on E'Ly HWL
					Along E'Ly HWL
57	4686620.2	440864.8			Point on E'ly HWL
			S.17°45'51"E	1.56'	
58	4686619.7	440864.9			Point on E'ly HWL
					Along E'Ly HWL
59	4686617.5	440865.6			Point on E'ly HWL
			S.17°45'51"E	15.95'	
60	4686612.9	440867			
			N.68°59'09"E	57.90'	
61	4686619.0	440883.6			
			S.88°10'51"E	189.60'	
62	4686616.4	440941.3			
			N.51°59'09"E	106.30'	
63	4686636.0	440967.1			
			S.28°38'51"E	124.90'	
64	4686602.3	440984.9			
			S.30°30'51" E	75.10'	
65	4686582.5	440996.2			
			S.04°12'09"W	150.70'	
66	4686536.7	440992.2			
			S.01°24'51"E	90.60'	
67	4686509.1	440992.5			Point on S Line S31-T12S-R41E
			S.89°35'09"W	12.65'	Along S Line S31-T12S-R41E
68	4686509.1	440988.7			INTX S Line S31-T12S-R41E and E'ly HWL
					Along E'ly HWL
1	4682078.9	439835.5			POINT OF BEG at the INTX of the HWL & S 1/16-Line S13-T13S-R40E





Reference Point *
Boundary Point
City
Oneida Road
Paved Road
Graded Road
Transmission Line
Project Boundary
Recreation
PacifiCorp Ownership
PacifiCorp Interest Land
Township/Range
Section
Qtr Qtr Section

* Reference Point coordinates are in UTM Zone 12, NAD 83, meters.

I hereby state that the project boundary represented on this drawing is developed with reasonable accuracy in accordance with FERC requirements. Data has been developed by PacifiCorp's GIS department from a variety of sources including Federal, State, County, and PacifiCorp GIS sources including orthophotos. No field surveys were conducted. All reasonable efforts have been made to ensure that positional accuracy conforms to National Map Accuracy Standards for maps at 1:24000 scale. Public Land Survey data is approximately located and is based on the Boise Meridian. Property lines are approximately located.

MAP TEXT ABBREVIATIONS:
- BLM = USDI Bureau of Land Management
- BOR = USDI Bureau of Reclamation
- HWL = High Water Line
- LMP = Land Management Plan
- PVT = Private Land
- SEC 24 = Section 24 Reservation Land under Federal Power Act
- (E#) = Easement/Property Rights

BOR lands in the Oneida Canyon are managed by BLM under authority of an "Interagency Agreement Between The Bureau of Reclamation and The Bureau of Land Management, December 1982," signed by both agencies on 3/25/1983.

PROFESSIONAL LAND SURVEYOR LICENSED 14107 10/8/19 STATE OF IDAHO JAMES J. COUTS

PROJECT BOUNDARY ACREAGE: ONEIDA DEVELOPMENT

1) TOTAL ACREAGE WITHIN PROJECT BOUNDARY	**1595.3 ACRES**
2) PACIFICORP LAND	**1039.7 ACRES**
3) FEDERAL LAND *	**562.8 ACRES**
4) PRIVATE LAND	**2.7 ACRES**

* Federal Land includes 9.9 acres of Section 24 lands owned by PacifiCorp.
ABOVE VALUES ARE APPROXIMATE. DERIVED FROM VARIOUS GIS DATASETS.
MAXIMUM FULL POOL ELEVATION (HWL) 4,882.9 FEET

PACIFICORP

PacifiCorp has reviewed the Project boundary shown herein. PacifiCorp either owns in fee simple or possesses the flowage easements* or property rights for all lands drawn on this map that are inside the boundary.

* Flowage easements to be updated in 2023 for 0.17 ac shown as PacifiCorp Interest Lands.

NO.	DATE	OLD FERC NO	DESCRIPTION
2a	08/13/2019	P-20-1040	Easement on submerged private lands. Adjustments using 2017 lidar data and land surveys
1	06/22/2016	P-20-1031	Order approving Exhibit G with revised federal acres & addition of LMP Conservation Lands
0	10/13/2005		Drawing numbers and Exhibit G-9 applied as approved in Order

Exhibit G - 5 **Rev 2a**
Bear River Hydroelectric Project, FERC No. 20
License Issued December 22, 2003
Oneida Development
Project Boundary
(Original Drawing Dated July 2005)
1 inch equals 1000 feet
1,000 500 0 1,000 Feet
N

FERC Drawing No. P-20-____

Appendix C – U.S. Fish and Wildlife Service Official Species List

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Idaho Fish And Wildlife Office
1387 South Vinnell Way, Suite 368
Boise, ID 83709-1657
Phone: (208) 378-5243 Fax: (208) 378-5262

In Reply Refer To:
Project Code: 2023-0106685
Project Name: Bear River Hydroelectric Project

July 19, 2023

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological

evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see https://www.fws.gov/birds/policies-and-regulations.php.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures see https://www.fws.gov/birds/bird-enthusiasts/threats-to-birds.php.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/birds/policies-and-regulations/executive-orders/e0-13186.php.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Code in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Idaho Fish And Wildlife Office
1387 South Vinnell Way, Suite 368
Boise, ID 83709-1657
(208) 378-5243

PROJECT SUMMARY

Project Code: 2023-0106685
Project Name: Bear River Hydroelectric Project
Project Type: Dam - Maintenance/Modification
Project Description: PacifiCorp is filing an Initial Consultation Document with the Federal Energy Regulatory Commission to initiate the amendment process of the current license of the Bear River Hydroelectric Project (Bear River Project) to include a pumped storage facility integrated into the Oneida Development. PacifiCorp is the owner, operator, and licensee of Bear River Project, which is located in southeastern Idaho, in the counties of Franklin and Caribou, about 14 miles northeast of Preston, Idaho. The Bear River Project is composed of three hydroelectric developments: Soda, Grace, and Oneida. The Bear River Project was issued a 30 year license by FERC on December 22, 2003 with an effective date of December 1, 2003. The current license expires on November 30, 2033. PacifiCorp anticipates the proposed pumped storage facility would increase the generating capacity by more than 2 MW and the hydraulic capacity by more than 15 percent. Therefore, PacifiCorp intends to file a capacity related amendment application with the Commission that would amend the Bear River Project's current license. With this proposed development, PacifiCorp also proposes to extend the current license term an additional 30 years.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@42.26238805,-111.75370053460666,14z

Counties: Franklin County, Idaho

ENDANGERED SPECIES ACT SPECIES

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
North American Wolverine *Gulo gulo luscus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/5123	Proposed Threatened

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

FLOWERING PLANTS

NAME	STATUS
Ute Ladies'-tresses *Spiranthes diluvialis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2159	Threatened

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are birds of particular concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or warrant special attention in your project location. To learn more about the levels of concern for birds on your list and how this list is generated, see the FAQ below. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your project area. To see exact locations of where birders and the general public have sighted birds in and around your project area, visit the E-bird data mapping tool (Tip: enter your location, desired date range and a species on your list). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list, including how to properly interpret and use your migratory bird report, can be found below.

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, click on the PROBABILITY OF PRESENCE SUMMARY at the top of your list to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
American White Pelican *pelecanus erythrorhynchos* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/6886	Breeds Apr 1 to Aug 31
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities.	Breeds Dec 1 to Aug 31

NAME	BREEDING SEASON
California Gull *Larus californicus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Mar 1 to Jul 31
Cassin's Finch *Carpodacus cassinii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9462	Breeds May 15 to Jul 15
Clark's Grebe *Aechmophorus clarkii* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Jun 1 to Aug 31
Evening Grosbeak *Coccothraustes vespertinus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 15 to Aug 10
Franklin's Gull *Leucophaeus pipixcan* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds May 1 to Jul 31
Golden Eagle *Aquila chrysaetos* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1680	Breeds Jan 1 to Aug 31
Rufous Hummingbird *selasphorus rufus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/8002	Breeds Apr 15 to Jul 15
Western Grebe *aechmophorus occidentalis* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/6743	Breeds Jun 1 to Aug 31
Willet *Tringa semipalmata* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.	Breeds Apr 20 to Aug 5

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read and understand the FAQ "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

Probability of Presence (■)

Each green bar represents the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during a particular week of the year. (A year is represented as 12 4-week months.) A taller bar indicates a higher probability of species presence. The survey effort (see below) can be used to establish a level of confidence in the presence score. One can have higher confidence in the presence score if the corresponding survey effort is also high.

How is the probability of presence score calculated? The calculation is done in three steps:

1. The probability of presence for each week is calculated as the number of survey events in the week where the species was detected divided by the total number of survey events for that week. For example, if in week 12 there were 20 survey events and the Spotted Towhee was found in 5 of them, the probability of presence of the Spotted Towhee in week 12 is 0.25.
2. To properly present the pattern of presence across the year, the relative probability of presence is calculated. This is the probability of presence divided by the maximum probability of presence across all weeks. For example, imagine the probability of presence in week 20 for the Spotted Towhee is 0.05, and that the probability of presence at week 12 (0.25) is the maximum of any week of the year. The relative probability of presence on week 12 is 0.25/0.25 = 1; at week 20 it is 0.05/0.25 = 0.2.
3. The relative probability of presence calculated in the previous step undergoes a statistical conversion so that all possible values fall between 0 and 10, inclusive. This is the probability of presence score.

Breeding Season (▪)
Yellow bars denote a very liberal estimate of the time-frame inside which the bird breeds across its entire range. If there are no yellow bars shown for a bird, it does not breed in your project area.

Survey Effort (|)
Vertical black lines superimposed on probability of presence bars indicate the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps. The number of surveys is expressed as a range, for example, 33 to 64 surveys.

No Data (–)
A week is marked as having no data if there were no survey events for that week.

Survey Timeframe
Surveys from only the last 10 years are used in order to ensure delivery of currently relevant information. The exception to this is areas off the Atlantic coast, where bird returns are based on all years of available data, since data in these areas is currently much more sparse.

▪ probability of presence ▪ breeding season | survey effort – no data

SPECIES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC

Additional information can be found using the following links:

- Birds of Conservation Concern https://www.fws.gov/program/migratory-birds/species
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf

MIGRATORY BIRDS FAQ

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the list of migratory birds that potentially occur in my specified location?
The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the 10km grid cell(s) which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the Rapid Avian Information Locator (RAIL) Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?
The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets.

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering or migrating in my area?
To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may query your location using the RAIL Tool and look at the range maps provided for birds in your area at the bottom of the profiles provided for each bird in your results. If a bird on your migratory bird species list has a breeding season associated with it, if that bird does occur in your project area, there may be nests present at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects
For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?
If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the Eagle Act should such impacts occur.

Proper Interpretation and Use of Your Migratory Bird Report
The migratory bird list generated is not a list of all birds in your project area, only a subset of birds of priority concern. To learn more about how your list is generated, and see options for identifying what other birds may be in your project area, please see the FAQ "What does IPaC use to generate the migratory birds potentially occurring in my specified location". Please be aware this report provides the "probability of presence" of birds within the 10 km grid cell(s) that overlap your project; not your exact project footprint. On the graphs provided, please also look carefully at the survey effort (indicated by the black vertical bar) and for the existence of the "no data" indicator (a red horizontal bar). A high survey effort is the key component. If the survey effort is high, then the probability of presence score can be viewed as more dependable. In contrast, a low survey effort bar or no data bar means a lack of data and, therefore, a lack of

certainty about presence of the species. This list is not perfect; it is simply a starting point for identifying what birds of concern have the potential to be in your project area, when they might be there, and if they might be breeding (which means nests might be present). The list helps you know what to look for to confirm presence, and helps guide you in knowing when to implement conservation measures to avoid or minimize potential impacts from your project activities, should presence be confirmed. To learn more about conservation measures, visit the FAQ "Tell me about conservation measures I can implement to avoid or minimize impacts to migratory birds" at the bottom of your migratory bird trust resources page.

WETLANDS

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

Please note that the NWI data being shown may be out of date. We are currently working to update our NWI data set. We recommend you verify these results with a site visit to determine the actual extent of wetlands on site.

FRESHWATER EMERGENT WETLAND

- PEM1Fh
- PEM1Ch
- PEM1A
- PEM1C

FRESHWATER FORESTED/SHRUB WETLAND

- PFO1A
- PSS1C
- PFO1C
- PSS1A

RIVERINE

- R5UBH
- R4SBC
- R3UBH

LAKE

- L1UBHh

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Appendix D – Draft Study Plan

Draft Study Plan
Oneida Pumped Storage Facility

Bear River Hydroelectric Project
FERC No. 20

Prepared for:

PACIFICORP

Prepared by:

WSP

Cirrus Ecological Solutions, LC

April 2023

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Wetlands Study Plan

1. Introduction

Construction and operation of the proposed Oneida Pumped Storage Facility has the potential to affect wetlands, wetland habitats, and waterbodies along the Oneida Reservoir, as well as potentially at the upper reservoir site, penstock alignment areas and powerhouse/pumping station. Accordingly, such impacts must be identified and disclosed as part of the Bear River Hydroelectric Project (Bear River Project) FERC License capacity amendment process.

An assessment of current, wetland baseline conditions is necessary as a starting point for determination of Oneida Pumped Storage Facility impacts. Given the time sensitive nature of the Oneida Pumped Storage Facility, PacifiCorp plans to initiate baseline data collection on wetlands and waterbodies in 2023 to develop detailed wetland/waters maps for use in understanding not only the resources, but also changes to habitats from potential operation of the Oneida Pumped Storage Facility.

The purpose of this study overview is to secure Collaborative Group review and input on the study scope and methodology. Based on that input, we will develop a comprehensive study plan to include in the Initial Consultation Document.

2. Background

PacifiCorp is preparing an application to FERC to amend the current Bear River Project license to add an upper reservoir at the Oneida Development and pumped storage capabilities to the existing Bear River Project FERC license. The proposed upper reservoir footprint is approximately 65 acres in extent, not including any planned construction roads/workspace, with an approximately ½ acre pumping/generating station located just south of the existing dam. The presence and areal extent of wetlands/waters within the proposed footprint is not currently known at this time. National Wetland Inventory Mapping resources suggest a single drainage feature may be located within the upper reservoir footprint with a few man-made stock ponds present as well, while along the Bear River where the proposed penstock would cross to the new powerhouse/pumphouse there also appears to be potential wetland and stream resources present.

3. Study Goals and Objectives

The goal of the wetland/waterbody study is to advance the understanding of the types, quantity, and distribution of features present at the proposed Oneida Pumped Storage Facility and within the Oneida Reservoir/Bear River proper to better evaluate potential impacts from the proposed Oneida Pumped Storage Facility. To achieve this goal the following objectives will be undertaken:

- Collect all related data/imagery/mapping/field data of relevant resources in the vicinity of the proposed Project area (i.e., NWI, NHD, IDFG, PacifiCorp, other).

- Conduct a Corps of Engineers field Waters of the US (WOTUS) delineation of lands within the proposed FERC project boundary for the pumped storage components of the Oneida Pumped Storage Facility. The delineation would include:
    - A terrestrial based field component to map the proposed upper reservoir area (~65 ac), the pumping/generation station location (~0.5 ac), and any areas of inter-connection and /or access as required (unknown acreage at this time).
    - An aquatic based field survey on the Oneida Reservoir using a boat, or boats, to access all the areas immediately along both reservoir shorelines within the defined Oneida Project Boundary.
    - Create legally defensible jurisdictional wetland mapping products and field data to support a FERC License capacity amendment application as well as provide mapping and data to support any future Clean Water Act Section 404/401 and/or State wetland permitting actions.

4. Review of Existing Information

The U.S. Fish and Wildlife Service's (FWS) classification scheme for wetlands serves as the national standard for wetland classification and is used to classify wetlands identified in the National Wetlands Inventory (NWI). NWI maps were consulted to achieve a baseline understanding of the size and scale of the wetlands within the study area. NWI maps are considered a good starting point for characterizing wetlands at a planning level; however, for the purposes of understanding potential impacts to wetlands more accuracy in the wetland mapping is required. Some publications report the accuracy of NWI mapper classification at about 75 percent (MDNR 2023). NWI maps show wetlands and mapped stream channels present where the Bear River enters Oneida Reservoir, potentially along both the shorelines in small pockets focused where drainages enter the reservoir, and downstream of the dam to the confluence with the existing powerhouse. Aerial imagery shows intermittent, agricultural ponds in the area within the proposed footprint of the upper reservoir that require additional investigation and mapping.

Examination of USGS National Hydrography Data (NHD) provided no additional detail as compared to the NWI data regarding the presence of relevant wetland or stream features.

5. Study Area

The proposed study area includes the proposed upper reservoir footprint (yellow), penstock alignments (red), proposed powerhouse/pumphouse (orange), and Oneida Reservoir shorelines (teal) as depicted in Figure 1 below.

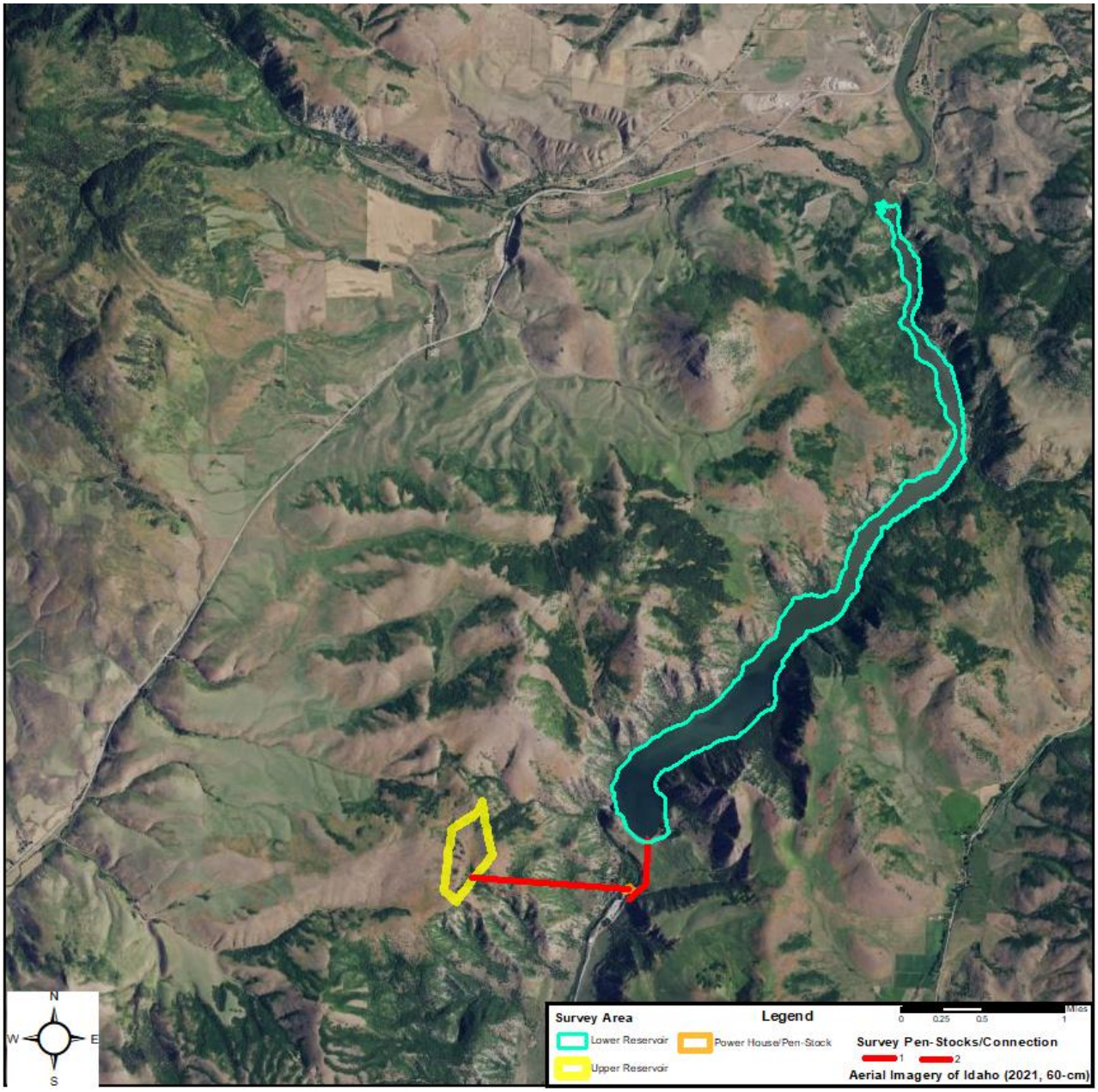


Figure 1 – Proposed 2023 Field Survey Areas for the Oneida Reservoir Pump Storage Facility

Figures 2 shows the mapped NWI wetlands, streams, and waterbodies in the proposed 2023 field study area.

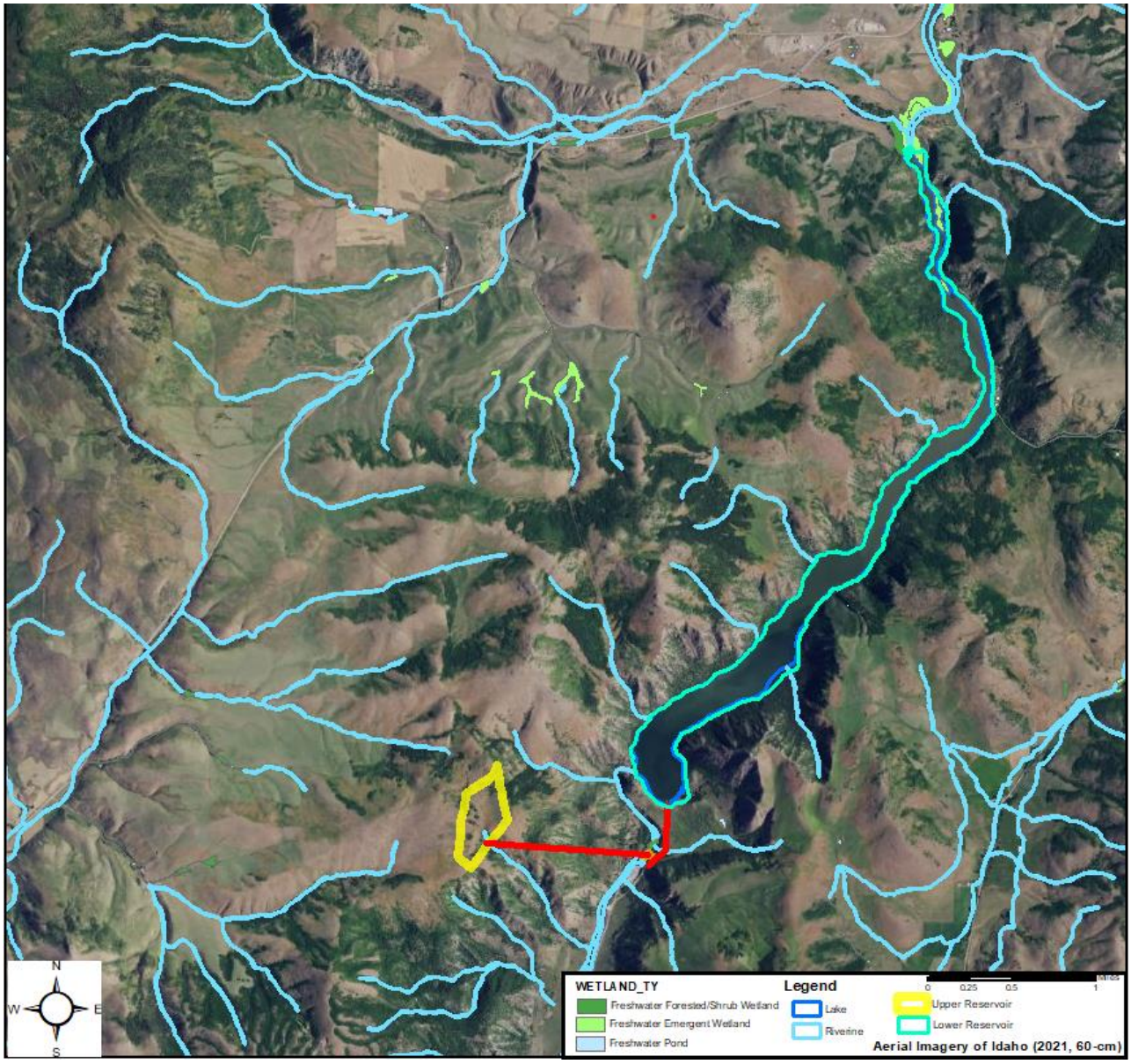


Figure 2 – Mapped NWI Wetlands, Streams, And Waterbodies for the Oneida Reservoir Pump Storage Facility

6. Methods

The PacifiCorp team proposes to mount initial field surveys in the 2023 field season to map potential wetland and waterbodies in the proposed Project area. Field surveys will be coordinated to account for the abnormally high amounts of snowpack runoff anticipated for the Bear River system in 2023. Prior to fieldwork, the PacifiCorp team will collect all related wetland/water data, aerial and satellite imagery, resource mapping, and any other available field

data for relevant resources in the vicinity of the proposed project area (i.e., NWI, NHD, IDFG, PacifiCorp data etc.) In addition, the PacifiCorp team proposes the following wetland and waterbody related field activities for 2023 as the initial steps to developing more comprehensive study plans:

- Upper Reservoir Wetland/Waterbody Delineation & Surveys
  - Assumes ~65 acres of terrestrial survey area in conjunction with Cirrus staff
  - 2 field days for Jurisdictional Wetland/Waterbody Mapping
  - Collect basic functional assessment data on any mapped features
  - Begin development of proposed impact framework

- Penstocks and Powerhouse Wetland/Waterbody Delineation & Surveys
  - Assumes ~0.5 acres of Survey Area for powerhouse location with Cirrus staff
  - 1/2 field days for Jurisdictional Wetland/Waterbody Mapping of Powerhouse
  - Assumes ~½ field days for ~ 1 to 1.5 miles of linear survey for proposed penstock locations
  - Collect basic functional assessment data on any mapped features

- Proposed Lower Reservoir Wetland/Waterbody Delineation & Surveys
  - Assumes ~ 466 acres of Survey Area for the lower reservoir performed primarily from a boat-based approach supported by Cirrus staff
  - Assumes 7-10 field days for Jurisdictional Wetland/Waterbody Mapping effort
  - Collect basic functional assessment data on any mapped features
  - Begin development of proposed impact framework

- Initial Wetland Reference Data Collection
  - 1 week of fieldwork in the Oneida Reservoir/Bear River area to develop conceptual understanding of wetland functions/services/variables/reference conditions/scaling etc. in conjunction with Cirrus staff

- Year 1 - Deliverables
  - Wetland Delineation Report and Technical Summary Memo
    - USACE/ID compliant wetland delineation report for the Project
    - USACE Preliminary Jurisdictional Determination mapping and data products
    - Summary Wetland/Waters Technical Memo
      - Likely Proposed Project Impacts
      - Potential Avoidance & Minimization Measures
      - Potential Compensatory Mitigation Expectations

Shoreline Erosion Study Plan

1. Introduction

Construction and operation of the proposed Oneida Pumped Storage Facility has the potential to introduce new project-related effects that existing, relevant and reasonably available information is insufficient to assess. One such effect is shoreline erosion associated with water level fluctuations within Oneida Reservoir from daily pumping and generating operations.

The purpose of this study overview is to secure Collaborative Group review and input on the study scope and methodology. Based on that input, we will develop a comprehensive study plan to include in the Initial Consultation Document.

2. Background

PacifiCorp is preparing an application to FERC to amend the current Bear River Project License to include a pump-storage development adjacent to its Oneida Development. The proposed Oneida Pumped Storage Facility would add an upper reservoir and powerhouse with reversible pump turbines. The proposed development would utilize the existing Oneida Reservoir as its lower reservoir. At present, the Bear River Project and the Oneida Development is largely dependent on the Bear Lake Irrigation Project to pump water from Bear Lake into the lower river during the irrigation season. During drought years the Bear River Project may generate at less than full capacity due to lack of water in the river. The Oneida Development is operated such that the reservoir is maintained at a fairly constant elevation of 4,882.40 feet USGS datum throughout the year, usually varying about 1 to 2 feet from month to month, and about 4 feet over a typical year.

The Oneida Project Boundary matches the maximum full pool elevation around Oneida Reservoir except in some small areas where PacifiCorp has fee ownership of lands. Fee owned lands are included in the Oneida Project Boundary.

3. Study Goals and Objectives

The goal of this study is to identify and characterize existing areas of erosion along the Oneida Reservoir shoreline to inform site-specific erosion monitoring, if needed. To achieve the study goal, this study has the following objectives:

1) Conduct desktop mapping to characterize existing land types, practices, and soils within 100 meters of the existing shoreline;
2) Conduct a field survey to map existing bank conditions and determine the locations of existing areas of erosion along the reservoir shoreline;
3) Produce an updated map or series of maps that illustrate the current shoreline condition and adjacent land-use practices;
4) Characterize the processes of erosion (e.g., slumping, slip) for those areas of erosion identified in Objective 2; and,
5) Discuss the likely causes of shoreline erosion (e.g., high flow, ground water seepage, surface-runoff, livestock grazing, boat wakes/wave action, water level fluctuations).

4. Review of Existing Information

Little information exists regarding shoreline erosion along the entire Oneida Reservoir shoreline. Information such as various GIS datasets do exist that would assist in characterizing the potential of erosion along the reservoir shoreline based on soil types, surficial geology, and land use practices, but additional field data and observations are needed to document existing erosional areas and the potential for erosion should the project be licensed and operated.

5. Study Area

The study area would be the Oneida Reservoir, including islands.

6. Methods

The following methods would be employed to complete the study:

- Map and characterize the existing shoreline in a GIS using land cover, soils, topography, and high-resolution aerial imagery (if available) datasets to identify areas along the reservoir shoreline for erosion potential;
- Conduct a field survey by boat along the reservoir shoreline to map using GPS and record using photography to categorize the existing bank feature according to categories/subdivisions in Table 1;
- Based on the results of the field survey, produce a map of the existing bank condition and adjacent land use/cover types;
- For each type and area along the bank identified as eroding discuss their respective likely cause.

Table 1. Categories of bank features.

Bank Feature	Sub-category	GIS Feature Type	Explanation
Stability	Stable	Line	First 3 sub-categories are stable banks, last 3 sub-categories are unstable
	Healed Erosion		
	Armored		
	Failing Armor		
	Vegetated Eroding		
	Eroding		
Erosion type	Notching/Overhangs	Line	Both a dominant and as many as 2 additional secondary erosion types mapped
	Tunnel scour		
	Topples		
	Plana slips		
	Rotational slumps		

Bank Feature	Sub-category	GIS Feature Type	Explanation
	Flows		
	Soil creep		
	None		
Bank texture	Bedrock	Line	Based on observations at base of bank
	Boulder		
	Cobble		
	Gravel		
	Sand/Loam		
	Clay		
Wood	Bank derived	Point	Recruited wood represents wood that has floated to location from upstream
	Recruited		

Water Quality Study Plan

1. Introduction

Idaho Department of Environmental Quality (IDEQ) has regulatory authority over all waters of the state to ensure these waters are fully supporting their assigned beneficial use. If water quality is not meeting standards that support beneficial use, IDEQ can implement and enforce actions that reduce pollutant loads and improve degraded conditions to restore water quality.

PacifiCorp is studying the potential to amend the Bear River Project's FERC License to add pumped storage to the Oneida Development by constructing and operating a proposed Oneida Pumped Storage Facility, which has the potential to affect water quality in Oneida Reservoir and potentially the Bear River below Oneida Dam. Accordingly, such impacts must be identified and disclosed as part of the amendment process.

The rationale for the study is to assess the potential water quality impacts of developing and operating the proposed Oneida Pumped Storage Facility and to document the results of that assessment for use in support of the Bear River Project capacity amendment. The purpose of this study overview is to secure Collaborative Group review and input on the study scope and methodology. Based on that input, we will develop a comprehensive study plan to include in the Initial Consultation Document.

2. Background

IDEQ lists the Bear River upstream and downstream of Oneida Reservoir as not supporting the beneficial use designation of cold-water aquatic life/salmonid spawning. A TMDL was approved for the Middle Bear Subbasin in 2006. It identifies total suspended solids (TSS) and total phosphorus (TP) as the non-supporting pollutants. In addition, water temperature (temperature) and flow modification are also identified as not supporting their beneficial use designation in the Bear River.

Established long-term monitoring sites have been sampled periodically for over 20 years. Intensive synoptic surveys were conducted in 1999 and 2000 during the development of the Middle Bear TMDL. These sites include locations immediately upstream and downstream of Oneida Reservoir that were actively monitored from 2006 through 2015 by IDEQ.

The Bear River has also been intensively monitored in the past above and below the Oneida Development as part of a coordinated effort between PacifiCorp and IDEQ to identify operational effects of the Bear River Project has on water quality. Results of the studies were reported to IDEQ to comply with the individual 401 water quality certifications at Soda, Grace, and Oneida developments.

Historically, water quality data collection in Oneida Reservoir itself has been intermittent, collected primarily to meet specific needs of individual projects. The reservoir was monitored in 1996-97 during the relicensing of the Oneida Development. The lack of intensive and continuous monitoring across temporal scales currently limits comprehensive analysis of water quality conditions in Oneida Reservoir.

The Bear River hydroelectric developments are known as sinks for mass loading of TSS and TP throughout the system, and water quality conditions typically improve immediately downstream of the developments. As water flows downstream, water quality conditions typically begin to degrade depositing pollutants into the upper sections of the successive reservoirs.

3. Study Goals and Objectives

The goals of the water quality study are to 1) collect updated baseline water quality information in Oneida Reservoir and the Bear River to document existing water quality conditions in the Project area; 2) assess effects on water quality parameters of concern resulting from water exchange between the upper and lower reservoirs and potential mobilization of sediments; and 3) determine whether potential impacts would violate IDEQ surface water quality standards. In order to reach these goals, the study has the following objectives:

1. Collect continuous temperature data near the dam in Oneida Reservoir and immediately upstream and downstream of the reservoir in the Bear River (above Cottonwood Creek near Highway 34 and in Oneida Narrows below the Oneida powerhouse, respectively). Data will be used to update baseline conditions.
2. Collect dissolved oxygen (DO) and turbidity data in Oneida Reservoir, with vertical profiles at two reservoir sites (near the dam and mid-reservoir) and upstream and downstream of the reservoir in the Bear River at the sites noted above. Data will be used to update baseline conditions.
3. Collect TSS and TP in Oneida Reservoir at the two proposed sites at three depths: surface, middle depth, bottom, and at the noted upstream and downstream in the Bear River sites. Data will be used to update baseline conditions.
4. Collect shallow sediment cores at the inflow area of Oneida Reservoir to characterize sediment deposits (sediment structure, particle size, and phosphorus concentration). Data will be used to define sediment composition.
5. Assess the existing bathymetry and bed-elevation models of Oneida Reservoir and determine if updated information is necessary.
6. Assess the baseline water quality conditions relative to applicable IDEQ surface water quality standards and designated uses.

4. Study Area

The proposed water quality study area includes four sites that have been historically monitored (Figure 1). The sites include two locations in Oneida Reservoir (Dam and Middle Station), and two locations upstream and downstream of Oneida Reservoir on the Bear River (Hwy 37 and downstream of the powerhouse). These four sites will capture conditions of Bear River inflows and outflows to Oneida Reservoir and conditions within the reservoir.

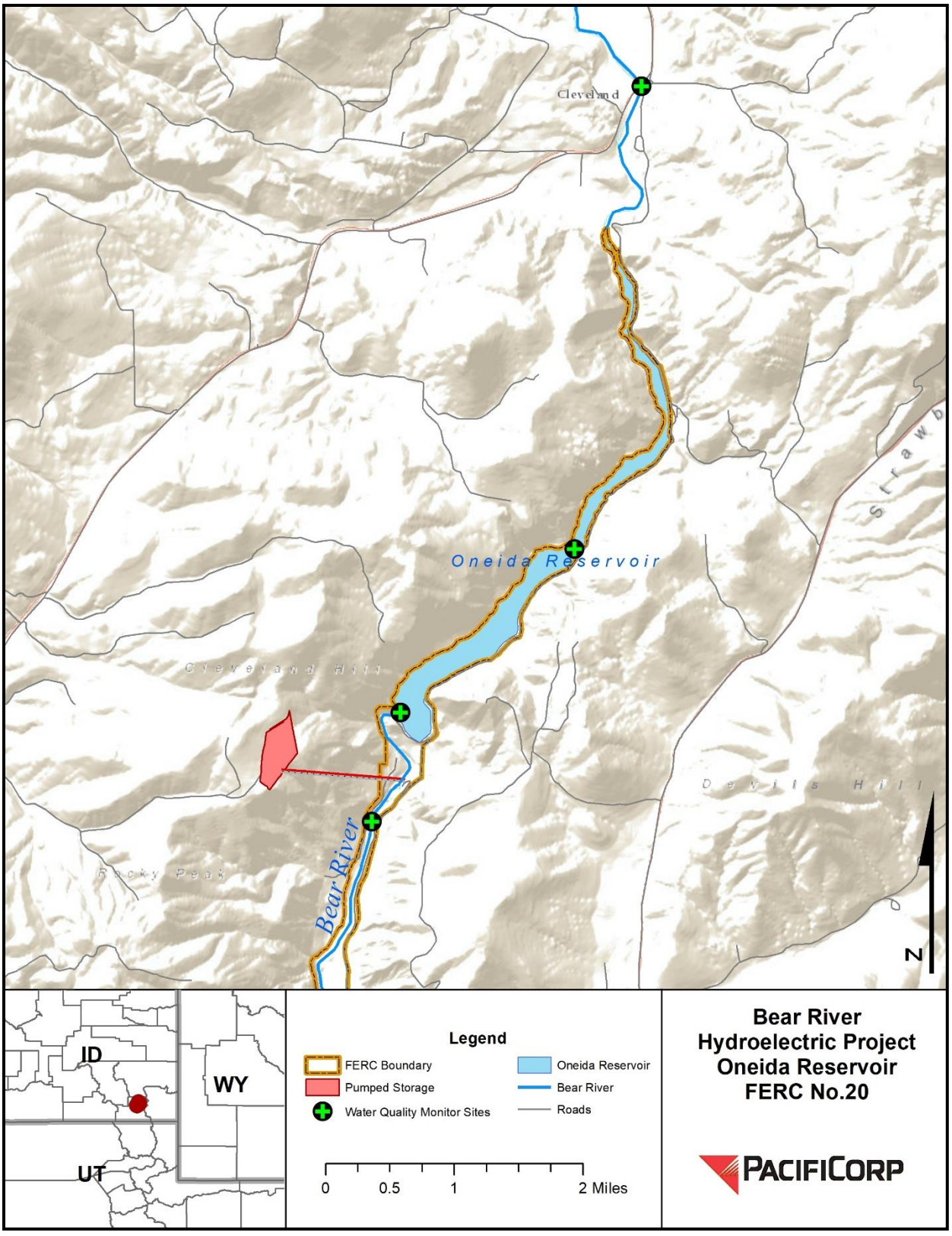


Figure 1. Water quality monitoring sites in the study area.

5. Methods

Water quality sampling will occur each month for a period of 12 months. It is anticipated that water quality sites will be established in May 2023, and monitoring will continue through April 2024. Data collection in the winter will be dependent on access and safety conditions on the reservoir.

Continuous temperature monitoring is proposed at three locations: the Hwy 34, Dam, and Narrows sites (Figure 1). Temperature sensors will be suspended from a cable near the Oneida dam, measured near the surface (0.3 meter) and then every 3 meters down to the bottom of the reservoir. Temperature sensors located in the Bear River will be fixed approximately 0.3 meter above the riverbed at each site. At each location, temperature data will be recorded at 15-minute intervals using a Hobo MX temperature sensor. Specifications are shown in Table 2.

During each monthly visit, DO and turbidity data will be collected at all sites using a Troll 9500. Vertical profiles for DO and turbidity will be collected at the two reservoir sites through the study period. A surface measurement will be collected, then the instrument will be lowered in 1-meter increments, allowing sufficient time for the reading to stabilize before recording a measurement and proceeding to the next depth interval. During winter conditions, vertical profiles may be unattainable and surface measurements may be collected near the shoreline as a single measurement.

Additionally, instantaneous DO and turbidity data will be recorded during each visit at the Bear River sites. Electronic data will be collected every 30 seconds for a period of 10 minutes at each site to allow for stabilization of the probe. Troll 9500 specifications are shown in Table 2.

Table 2. Technical specifications of sensors used to measure water quality.

Meter	Parameter	Accuracy	Accuracy Range	Methodology
Hobo MX	Temperature, °C	±0.1 °C	-5 °C to 40 °C	
Troll 9500	DO, mg/L and % saturation	±0.1 mg/L, ±0.2 mg/L	0-8 mg/L, 8-20 mg/L	ASTM D888-05, Test Method C
Troll 9500	Turbidity, NTU	±5% or 2 NTU	0-2000 NTU	ISO 7027

During each visit, water samples will be collected at each site and analyzed for TP and TSS. Reservoir grab samples will be collected near the surface, middle depth, and at the bottom at both sites. Grab samples will be collected at upstream and downstream sites on the Bear River. During the winter months, surface samples may be collected near the shoreline as a single surface sample at both reservoir sites.

All samples collected will be kept on ice from the time of collection until delivery to the laboratory. Field and trip blanks (de-ionized water samples) will be retained and analyzed during each trip to evaluate potential contamination. Occasionally duplicate samples will also be collected at an individual site to verify accuracy.

Sediment cores will be collected at 10 random locations in the upper third of Oneida Reservoir at various depths to characterize depositional sediment. Samples taken for particle size analysis will be classified using the Unified Soil Classification System (USCS). Composite samples will be taken to determine the percentage of grain size. USCS standard sieves will be used for processing samples down to a No. 230 or 63µm sieve.

Finer material will be classified using a hydrometer. Prior to hydrometer measurements, each sample will be tested for percent organic material. Sediment samples with more than 30 percent organic material will not be measured for grain size with a hydrometer due to error probability. Sediment cores will also be analyzed for TP.

6. Reporting

Verbal updates will be provided during monthly progress meetings for the Project. A detailed technical report documenting the methods, analyses, and results of the study will be provided in draft form to PacifiCorp within 90 days of the end of water quality monitoring.

Following PacifiCorp review, the draft report will be distributed to participating agencies and stakeholders for comment. Comments will be addressed and incorporated into the final report to support NEPA document preparation.

Wildlife Study Plan

1. Introduction

PacifiCorp's proposed Oneida Pumped Storage Facility area encompasses several habitat types that support a range of wildlife. Construction and operation of the Oneida Pumped Storage Facility has the potential to adversely affect the species and their habitat, directly and/or indirectly. Accordingly, such impacts must be identified and disclosed as part of the capacity amendment application.

The rationale for the study is to assess the potential impacts of amending the Bear River Hydroelectric Project's FERC license to include pumped storage hydroelectric generation at the Oneida Development and to document the results of that assessment for use in completing an applicant prepared NEPA document in support of an application to amend the Bear River license.

The purpose of this study overview is to secure Collaborative Group review and input on the study scope and methodology. Based on that input, we will develop a comprehensive study plan to include in the Initial Consultation Document.

2. Background

2.1 Special Status Species

As the federal agency with licensing authority over the Bear River Project, the FERC is subject to the provisions of Endangered Species Act (ESA) Section 7, which requires federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that actions they fund, authorize, permit, or otherwise carry out will not jeopardize the continued existence of any listed species or adversely modify designated critical habitats.

The USFWS's Information for Planning and Consultation (IPaC) website (USFWS 2023) identifies three listed, proposed, or candidate species under the ESA to be addressed for the Project. These include Canada lynx (*Lynx canadensis*, threatened), North American wolverine (*Gulo gulo luscus*, proposed threatened), and monarch butterfly (*Danaus plexippus*, candidate). Canada lynx and wolverine would be unlikely to utilize the Project area due to the absence of suitable habitat, therefore, these species are not addressed. The monarch butterfly, and its host milkweed plant, may occur in the Project area.

The USFWS also identifies several bird species as Birds of Conservation Concern (BCC). These species are most likely to become candidates for listing under the ESA, representing the highest conservation priority for USFWS. The list is based on population abundance and trends, threats to habitat, and the size of the population range. The greater sage-grouse (*Centrocercus urophasianus*) is identified as a BCC, but habitat mapping by the BLM shows that the Project area does not fall into a sage-grouse Habitat Management Area, meaning that the area is unlikely to support sage grouse and that no sage-grouse-specific restrictions apply to the Project area (BLM 2015). Several BCC have been identified as potentially occurring in the Project area, and further desktop analyses will identify these species.

The Idaho Department of Fish and Game (IDFG) designates several wildlife species as Species of Greatest Conservation Concern (SGCN) to implement wildlife management and habitat restoration for species to preclude them being listed as threatened or endangered under the ESA. The 2015 Idaho State Wildlife Action Plan (SWAP) identifies Tier 1 SGCN as the "highest priority for the SWAP and to represent species with the most critical conservation needs, i.e., an early-warning list of taxa that may be heading toward extirpation." Tier 2 SGCN are identified as "secondary in priority and represent species with high conservation needs—that is, species with longer-term vulnerabilities or patterns suggesting management intervention is needed but not necessarily facing imminent extinction or having the highest management profile." Future desktop analyses and consultation with IDFG will identify those Tier 1 and Tier 2 SGCN not covered by the ESA or BCC.

Bald and golden eagles fall under the Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. 668-668d), which prohibits any person or organization without a permit from "taking" bald or golden eagles. Disturbing eagles is considered as "take" under the Act, and regulations further define "disturb" as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, 1) injury to an eagle, 2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or 3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" (50 CFR 22.6). Bald eagles of historically nested in the "Old Camp" at Oneida Development. Mapping nests and foraging habitat of eagles in the Project area will provide baseline data for assessing potential impacts of the Project on these species.

Migratory bird species are managed by USFWS under the authority of the Migratory Bird Treaty Act (MBTA; 16 U.S.C. 703-712). The MBTA prohibits the take of protected migratory bird species without prior authorization from USFWS. Collecting baseline species occurrence data in the Project area will help inform assessment of potential impacts on migratory bird species that do not fall into one of the categories above.

2.2 Species of High Public Interest

Wildlife species of high public interest represent game species, including big game, upland birds, and waterfowl. Desktop analyses and consultation with IDFG will identify which species of high public interest are found in the Project area along with their associated habitats.

2.3 General Wildlife

Those wildlife species not covered under special status species and species of high public interest will be considered general wildlife. These include birds, mammals, reptiles, amphibians, and invertebrates not covered above.

3. Study Goals and Objectives

The goal of this study is to determine if wildlife species including special status species, species of high public interest, and general wildlife species potentially occur in the Project area. To accomplish this goal, the study has the following objectives:

- Categorize and map habitat types in the Project area.

- Determine if habitat for special status species and species of high public interest exist;
- Identify any observations of special status species in the Project area;
- Determine if potential direct or indirect impacts would occur on special status species, species of high public interest, and general wildlife species resulting from Project construction and operation.

4. Study Area

The proposed study area will include a 1-mile buffer around the proposed upper reservoir, penstock, powerhouse, and existing Oneida Reservoir (Figure 1). This buffer will account for any indirect effects on wildlife species. Future desktop review may decrease this buffer.

5. Methods

5.1 Special Status Species

Methods for special status wildlife species will start with desktop analyses, literature review, and consultation with IDFG to identify which special status species have the potential to occur within the Project area. Next, desktop analyses will be performed to determine the specific habitat requirements for each species and whether suitable habitat exists within the Project area. Desktop analysis and consultation with IDFG will be used to determine if there have been observations for these species within the Project area. Desktop analysis will also be performed to identify any potential for direct and/or indirect impacts on these species and habitats from Project construction and operation. If these criteria are met, field surveys will be conducted for each species to determine current occupancy of the Project area.

If the above criteria are met, field surveys for monarch butterflies will focus on areas where milkweed, their only host plant, is most likely to be found. Priority survey areas will include roadways, fence lines, and edges of waterways. Areas where milkweed is found will be mapped and attributed with information regarding the aerial size of the population and observed presence/absence of monarchs.

Field surveys for BCC species, avian SGCN species, and migratory birds will include point-count surveys to determine occupancy of the Project area. These surveys will be performed twice between May 20 and June 15, following a standardized protocol. Certain BCC species and avian SGCN may necessitate different survey methods, and these surveys will follow established protocols based on the species of interest. Survey needs for non-avian SGCN species will be determined based on the species and established survey protocols.

Nest surveys for all raptors, including bald and golden eagles, will be performed to identify nesting pairs that may be subject to direct and/or indirect impacts of Project construction and operation. Following a standard protocol, biologists will perform raptor nest searches throughout the Project with a 1-mile buffer around it. Additionally, biologists will perform raptor point-count surveys throughout the Project with a 2-mile buffer around it (USFWS 2013). Mapping flight paths and nesting locations of eagles in the Project area will inform any impacts to these species from Project construction and operation.

5.2 Species of High Public Interest

Using desktop analyses and input from IDFG, the amount and extent of habitat for species of high public interest will be determined in and around the Project area. Where necessary, summer and winter ranges will be considered, along with other specialized habitat and migration pathways. Habitat maps will be produced of the vicinity of the Project to determine direct and/or indirect impacts on these habitats from Project construction and operation, along with any potential offsetting habitat.

5.3 General Wildlife

Desktop analyses will be performed to identify, categorize, and describe the various habitat types found in the vicinity of the Project area. From these habitat types, representative general wildlife species that are not addressed as special status species or species of high public concern will be identified for each habitat type. This information will then be used to determine direct and indirect impacts on these habitats from Project construction and operation.

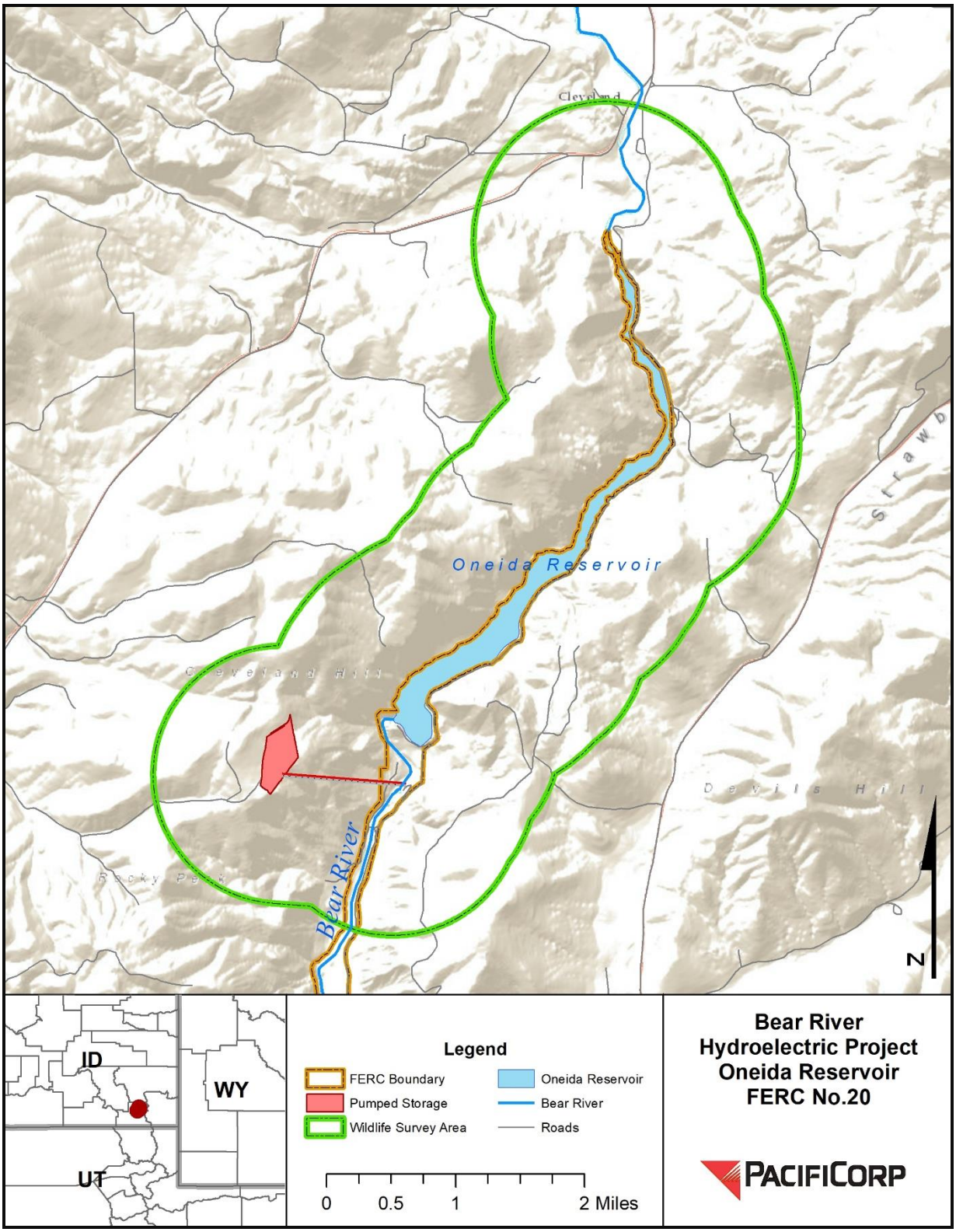


Figure 1. Wildlife survey area.

6. Reporting

Verbal updates will be provided during monthly progress meetings for the project. A detailed technical report documenting the methods, analyses, and results of the study addressing wildlife species will be provided in draft form to PacifiCorp within 90 days of the end of the data collection phase. Following PacifiCorp review, the draft report will be distributed to participating agencies and stakeholders for comment. Comments will be addressed and incorporated into the final report to support NEPA document preparation.

7. References

BLM (Bureau of Land Management). 2015. Idaho and Southwestern Montana greater sage-grouse approved resource management plan amendment.

IDFG (Idaho Department of Fish and Game). 2017a. Idaho State Wildlife Action Plan, 2015. Boise (ID): Idaho Department of Fish and Game. Grant No.: F14AF01068 Amendment #1. Sponsored by the US Fish and Wildlife Service, Wildlife and Sport Fish Restoration Program.

USFWS (U.S. Fish and Wildlife Service). 2013. Eagle Conservation Plan Guidance.

USFWS (U.S. Fish and Wildlife Service). 2021. Birds of Conservation Concern.

USFWS. 2023. List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project. US Fish and Wildlife Service. April 7, 2023. Letter generated by the IPaC website, https://ipac.ecosphere.fws.gov/.

Federally-Listed Threatened and Endangered Plants and Noxious Weeds Study Plan

1. Introduction

PacifiCorp's proposed Oneida Pumped Storage Facility area includes several vegetation cover types. Construction and operation would have the potential to adversely affect plant species directly and/or indirectly. Accordingly, such impacts must be identified and disclosed as part of the process to apply for a capacity amendment to the Bear River Project FERC License.

The rationale for the study is to assess the potential impacts of amending the Bear River Project's FERC License to include pumped storage hydroelectric generation at the Oneida Development and to document the results of that assessment for use in completing an applicant prepared NEPA document in support of the FERC license amendment.

The purpose of this study overview is to secure Collaborative Group review and input on the study scope and methodology. Based on that input, we will develop a comprehensive study plan to include in the Initial Consultation Document.

2. Background

As the federal agency with licensing authority over the Bear River Project, the FERC is subject to the provisions of the Endangered Species Act Section 7, which requires federal agencies to consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that actions they fund, authorize, permit, or otherwise carry out will not jeopardize the continued existence of any listed species or adversely modify designated critical habitats.

The USFWS's Information for Planning and Consultation (IPaC) website (USFWS 2023) identified Ute ladies'-tresses orchid (*Spiranthes diluvialis*), federally listed as threatened under the Endangered Species Act, as a species that occurs in the study area.

Idaho's Noxious Weed Law requires that invasive weeds be controlled both on public and private land by the individual, company or agency owning the land.

2.1 Ute ladies'-tresses

Throughout the species' range, Ute ladies'-tresses is endemic to mesic or wet meadows and riparian/wetland habitats in relatively low elevations near spring, seeps, lakes, or perennial streams (Moseley 1998). Soils may be inundated early in the growing season, normally becoming drier but retaining subsurface moisture through the season. In drought years, however, subsurface moisture may not be present within 12 inches below the soil surface.

In Idaho, Ute ladies'-tresses occurs in a variety of areas including swales, mesic meadows, cottonwood stands, and islands. These areas contain at least some component of grass and/or forb-dominated habitat. However, Ute ladies'-tresses plants can be surrounded by, or located in close proximity to, shrubs or trees such as willows, silverberry, or cottonwoods. Associated species may include: bentgrass (*Agrostis stolonifera*), woolly sedge (*Carex lanuginose)*, beaked spikerush (*Eleocharis rostellata*), silverberry (*Eleagnus commutata*), bog orchid (*Habenaria*

dilatate), Baltic rush (*Juncus balticus*), horsetails *(Equisetum* spp.), sandbar willow (*Salix exigua*), yellow willow (*S. lutea*), and narrowleaf cottonwood (*Populus angustifolia*) (Moseley 1998).

In Idaho, Ute ladies'-tresses was first discovered in 1996 along the South Fork of the Snake River in eastern Idaho. Most occurrences of Ute ladies'-tresses are from along the South Fork of the Snake River floodplain, near the confluence of the Henry's Fork, upriver to the Swan Valley area in Jefferson, Madison, and Bonneville counties. In 2002, Ute ladies'-tresses was found at Chester Wetlands WMA along the Henry's Fork in Fremont County. Other populations extend upstream toward Ashton Reservoir. Although Ute ladies'-tresses has not been previously identified in the Oneida project area, potentially suitable habitat may occur.

2.2 Noxious Weeds

Noxious weeds that commonly occur at the Oneida Development and other locations in Franklin County may include thistles, dyers' woad, houndstongue and poison hemlock. PacifiCorp has typically controlled these species in the past with herbicide.

3. Study Goals and objectives

The goals of this study plan are 1) to determine whether Ute ladies'-tresses orchid, federally listed as threatened, occurs in the Project area and to what extent Project construction and operation would affect the species, 2) establish a noxious weed baseline inventory of the study area, and 3) assess the potential for introduction and/or spread of noxious weeds. To accomplish this goal, the study has the following objectives:

- Systematically identify and survey areas of potential suitable habitat within the Project area to determine if and where Ute ladies'-tresses occurs.
- Assess potential direct or indirect effects on this species resulting from Project construction and operations.
- Identify any noxious weed populations occurring in the Project area and document their location and extent.
- Overlay the weed inventory with the Project disturbance footprint to assess potential for weed introduction and spread.

4. Study Area

The proposed Oneida Pumped Storage Facility area will include the upper reservoir site and other areas that could be disturbed by the Project as well as shoreline areas inside the Oneida Project Boundary that may be affected by changes in water levels (Figure 1). This area captures where disturbances could impact Ute ladies'-tresses or affect weed introduction and/or spread.

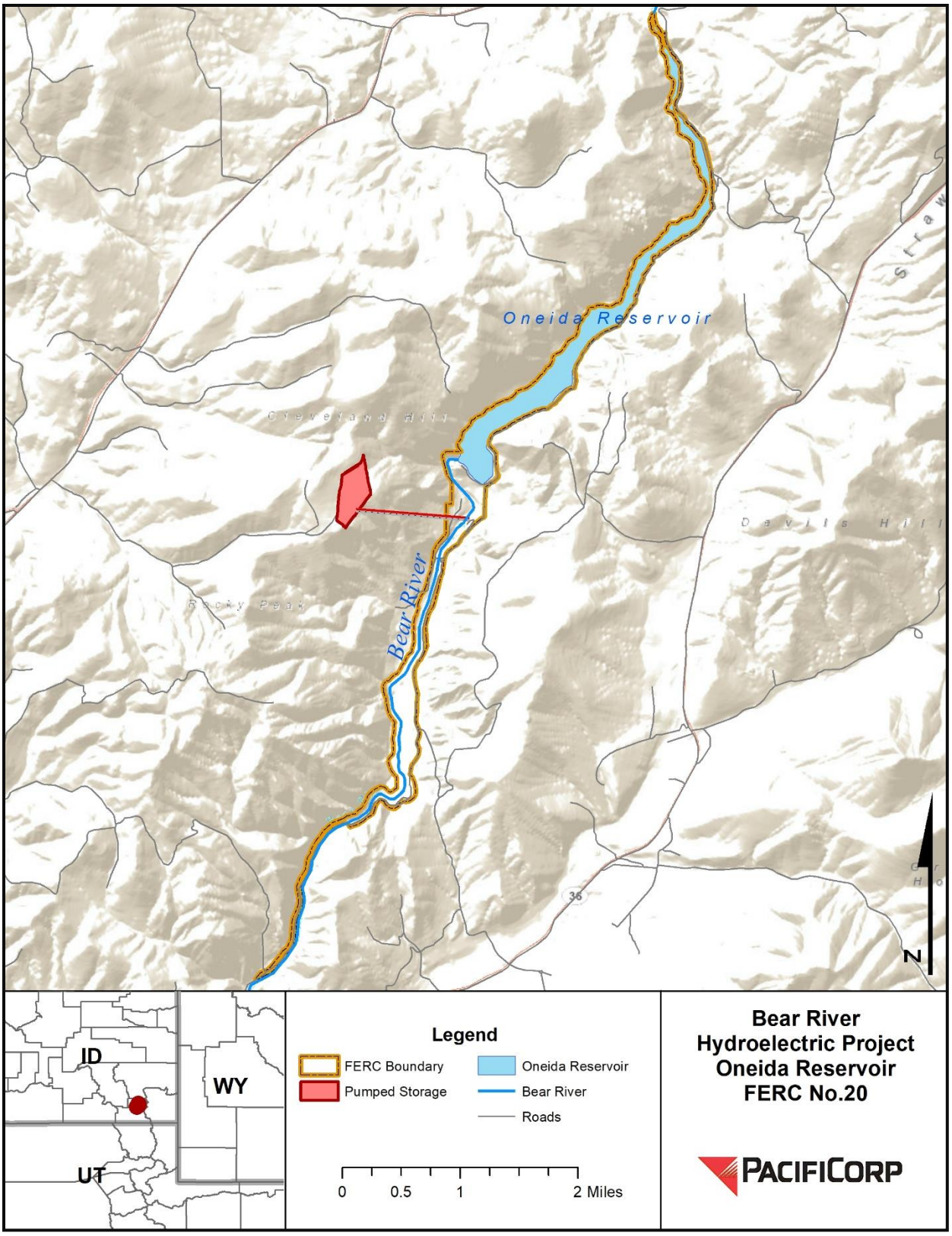


Figure 1. T&E and noxious weed survey area.

5. Methods

A desk-top review will be initially conducted to assess if there is potentially suitable Ute ladies'-tresses habitat present in the Project area. Any surveys for the species will be completed following the protocol outlined by the USFWS (1992) for this species. This protocol requires 2 years of surveys because the species may not flower every year. Important elements of the survey protocol include the following:

- Evaluation of the study area to determine where potentially suitable habitat exists using a combination of aerial imagery, existing information, and field reconnaissance.
- Scheduling field surveys to correspond to flowering in other known populations, likely beginning in the later part of July and extending through mid-to-late August, depending on conditions.
- Completing pedestrian surveys providing 100 percent coverage in suitable habitat using closely-spaced transects.
- Recording population information if any occurrences of Ute ladies'-tresses are located.

Existing sources of information on noxious weeds occurrences in the Project area will be reviewed to compile a preliminary noxious weed inventory. PacfiCorp, the county weed control specialist, and the BLM will be consulted for available data. Existing information will be supplemented with weed surveys of the Project area to develop the baseline inventory. Surveys will be conducted in the areas where disturbance generated by construction or operation of the Project would occur. If possible, surveys will be conducted during the same time window as Ute ladies'-tresses surveys. Impact analysis will be based on the updated baseline inventory and the footprint of Project disturbance during construction and operation. This will include access routes, staging areas, and other locations subject to soil disturbance.

6. Reporting

Verbal updates will be provided during monthly progress meetings for the project. A detailed technical report documenting the methods, analyses, and results of the study addressing Ute ladies'-tresses and noxious weeds will be provided in draft form to PacifiCorp within 90 days of the end of the data collection phase. Following PacifiCorp review, the draft report will be distributed to participating agencies and stakeholders for comment. Comments will be addressed and incorporated into the final report to support NEPA document preparation.

7. References

Moseley, R.K. 1998. Ute ladies tresses (*Spiranthes diluvialis*) in Idaho: 1998 status report. Report prepared by the Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise ID.

USFWS (US Fish and Wildlife Service). 1992. Interim survey requirements for Ute Ladies'-tresses orchid (*Spiranthes diluvialis)*. US Fish and Wildlife Service. November 23.

USFWS. 2023. List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project. Project Code: 2023-0053064. US Fish and Wildlife Service. March 8. Letter generated by the IPAC website, https://ipac.ecosphere.fws.gov/.

Recreation Resources Study Plan

1. Introduction

PacifiCorp manages recreational facilities located adjacent to Oneida Reservoir and the Bear River downstream of the Oneida Development. Amending the Bear River Project's FERC License to include pumped storage hydroelectric generation at the Oneida Development has the potential to adversely affect these facilities and the people using them either directly or indirectly. Accordingly, such impacts must be identified and disclosed as part of the license amendment process.

The rationale for the study is to assess the potential recreation impacts of developing and operating the Oneida Pumped Storage Facility and to document the results of that assessment for use in completing the license amendment.

The purpose of this study overview is to secure Collaborative Group review and input on the study scope and methodology. Based on that input, we will develop a comprehensive study plan to include in the Initial Consultation Document.

2. Background

Article 416 in the Bear River License states that "The licensee shall prepare a revised recreation plan, in consultation with the ECC" (PacifiCorp 1999). The recreation plan must include: a description of all existing recreation facilities, measures to minimize construction-related impacts associated with new facilities, parties responsible for operating and maintaining facilities, a schedule for funding operation and maintenance activities, and conceptual drawings of each facility. The recreation plan is documented in the Final Recreation and Traffic Safety Plan – Bear River Hydroelectric Project FERC Project No. 20 (EDAW 2005). The activities outlined in this study overview will estimate potential impacts to facilities in the Final Recreation and Traffic Safety Plan associated with the Oneida Development.

There are currently two developed campgrounds managed by BLM in the area, including Maple Grove and Red Point campgrounds. Maple Grove Campground is entirely on BLM land on the east shoreline of Oneida Reservoir. It includes 12 campsites, each with a picnic table, fire pit, and grill, and two vault toilet buildings. The vault toilets and two of the campsites are ADA-accessible. The Maple Grove Campground has a small day use area with a boat ramp, floating dock, and gravel parking area for campground users (PacifiCorp 1999). There is a $5 per night user fee at this site (BLM 2023). Redpoint Campground is located on the east side of the Bear River below Oneida Dam. It is mostly on BLM land but also includes a sliver of PacifiCorp property on the north end. It has 10 sites with a maximum capacity of two vehicles at each site and up to 20 people, several picnic tables and a vault toilet building (PacifiCorp 1999). Both campgrounds operate at or near capacity throughout the summer season. There is a $5 per vehicle per night fee associated with this site.

Maple Grove Hot Springs is a privately-owned, commercial recreation area located near the north end of Oneida Reservoir on Maple Grove Road. Use of developed hot springs is the

primary activity, and overnight accommodation is available. This is the only private recreation resource within the Oneida Development area that is not owned by PacifiCorp.

The Oneida Day Use Area is located on the southeastern shoreline of Oneida Reservoir, immediately upstream of Oneida Dam. This recreational site includes a boat ramp, floating dock, 10 picnic sites, a double vault toilet building, and parking for roughly 20 vehicles (PacifiCorp 1999).

Two river access points are located downstream of Oneida Dam. The Oneida Narrows Put-In is roughly 1 mile downstream of Oneida Dam. It includes a hand-launch boat ramp, a gravel parking area with a capacity of about 10 vehicles, and a portable restroom (Cirrus 2015). The Oneida Narrows Take-Out is about 5 miles downstream of Oneida Dam. It includes a hand-launch boat ramp, a portable restroom and parking area for about 10 vehicles along the road shoulder.

The main recreational activities occurring in the Project area are boating in Oneida Reservoir and the Bear River downstream, fishing in both those waters, and some hunting within and around the Bear River FERC Project Boundary.

Boater use includes pleasure craft of various kinds on the reservoir with water skiing, wakeboarding, and jet skiing becoming increasingly popular relative to sight-seeing, fishing, and exercise (e.g., kayaks and stand-up paddleboards). In the river downstream, canoes, kayaks, and inflatables run from the put-in below the dam to Red Point Campground or on down the canyon to Oneida Narrows Take-out. This scenic run includes some mild rapids and is very popular, especially on summer weekends and holidays.

Fishing in the reservoir, from boats or the bank, targets primarily introduced smallmouth bass, walleyed pike, and yellow perch. The Bear River below the reservoir is a popular and productive fishery for introduced rainbow and brown trout as well as walleyed pike.

Hunting opportunities for mule deer, elk, upland game, and waterfowl exist in and around the Oneida Development area. Hunting season for most game species occurs during the fall, though spring wild turkey season is also provided.

3. Study Goals and objectives

The goals of this study overview are to evaluate potential effects of the Oneida Pumped Storage Facility construction and operations on (1) recreational facilities that could be impacted by fluctuating water levels in Oneida Reservoir, (2) fishing opportunities in the reservoir and the river downstream, and (3) hunting opportunities at the site of the proposed upper reservoir, flowline corridor connected to the penstock and shoreline areas of Oneida Reservoir. In order to achieve these goals, the study has the following objectives:

- Evaluate change in water surface elevation from Project operating scenarios at boat launch facilities to assess potential impacts on boater access.
- Identify areas where lower surface elevations might expose boaters to submerged or exposed hazards or otherwise limit boating on the reservoir.

- Determine if bank erosion impacts would affect campgrounds or other recreations sites on the reservoir shoreline or the river downstream.
- Assess potential impacts on the recreational fisheries in the reservoir and river from project construction and operations.
- Identify potential impacts on hunting opportunities due to loss of wildlife habitat and game species, as well as access to hunting areas.

4. Study Area

The proposed recreation study area (Figure 1) includes Oneida Reservoir, the Bear River through Oneida Narrows, and the proposed upper reservoir and flowline areas.

5. Methods

Impacts on boat launch facilities described in section 2 will be determined from measuring water depth at the lower end of each boat ramp or developed bank areas used for small boat/floater access to compare with the proposed lower reservoir elevation during pumping operations.

Known boating hazards and popular fishing locations will be mapped based on existing bathymetry and local knowledge of the area. Potential exposure of hazards or interference with recreational activities (i.e., fishing, boat travel, water skiing) will be evaluated based on this information.

Any potential impacts (i.e., bank erosion) on camping facilities, including the Redpoint Campground, Maple Point Campground, and Maple Grove Hot Springs will be determined through analysis of existing data and field verification. Areas of existing and potential bank erosion at recreation sites will be determined and mapped using aerial imagery and field verification.

Beyond the assessment of potential impacts on boat-launch facilities, other impacts on sport fishing will be determined using a desktop analysis of existing data on stocking and catch rates in the reservoir as well as angling use estimates. Water quality results will be evaluated in terms of how changes in temperature and other parameters would affect the reservoir and river fisheries, based on published tolerances of the species present.

Potential impacts on hunting will be evaluated based on desktop analysis of wildlife study results (see Wildlife Study Overview), particularly habitat and population effects on mule, deer, elk, upland game, and waterfowl. Potential access limitations associated with the upper reservoir and flowline will also be considered. Existing data on the type and extent of hunting in these areas will be requested from IDFG.

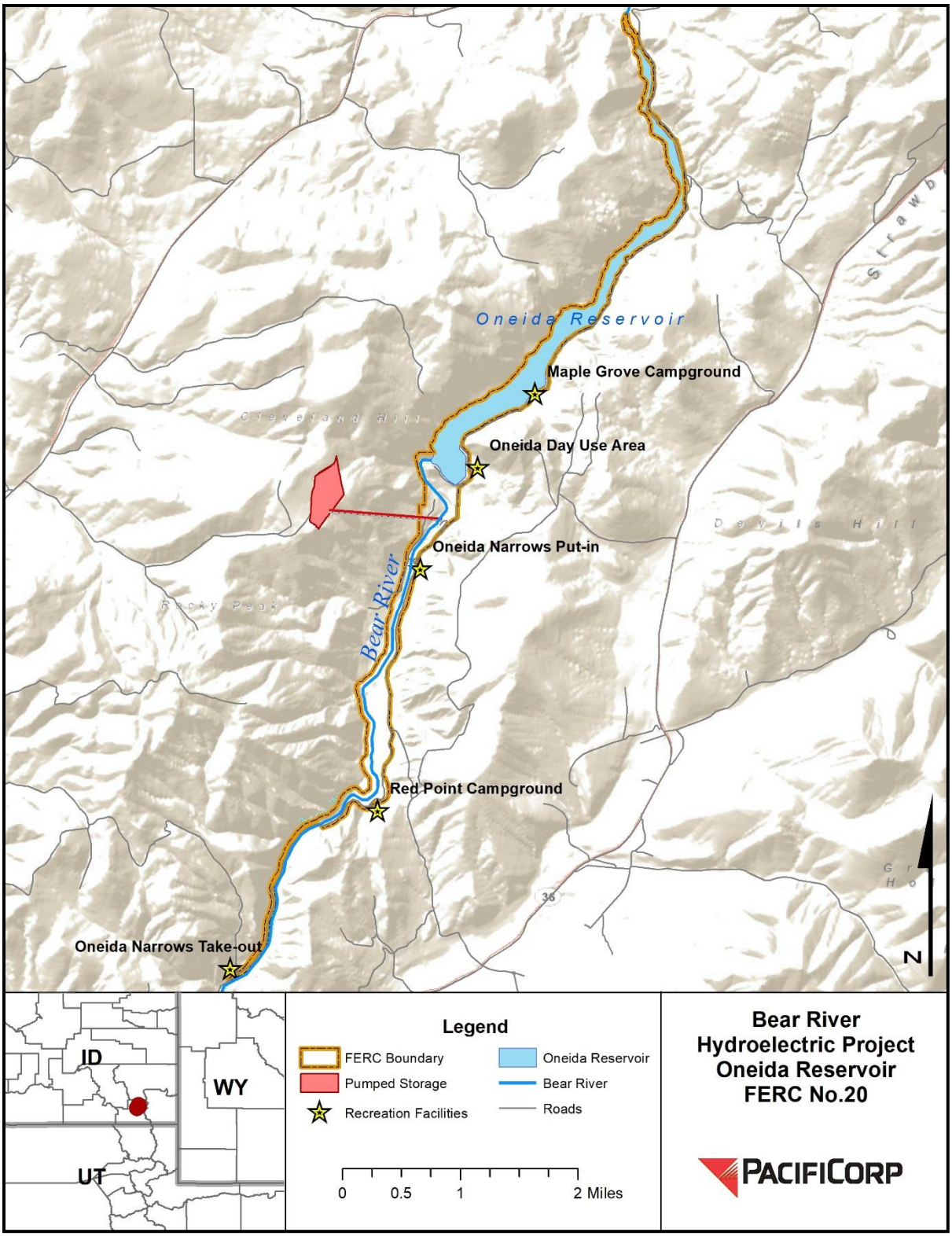


Figure 1. Recreation facilities at the Oneida Reservoir project.

6. Reporting

Verbal updates will be provided during monthly progress meetings for the project. A detailed technical report documenting the methods, analyses, and results of the study will be provided in draft form to PacifiCorp within 90 days of the end of the data collection phase. Following PacifiCorp review, the draft report will be distributed to participating agencies and stakeholders for comment. Comments will be addressed and incorporated into the final report to support the FERC license amendment.

7. References

PacifiCorp. 1999. Oneida Hydroelectric Project (FERC Project No. 472) License Application. September 1999.

EDAW. 2005. Final Recreation and Traffic Safety Plan – Bear River Hydroelectric Project FERC Project No. 20. Prepared for PacifiCorp, Portland, Oregon. Prepared by EDAW Inc., Seattle, Washington.

Cirrus (Cirrus Ecological Solutions). 2015. Oneida Site Plan. Prepared for PacifiCorp, Portland, Oregon. Prepared by Cirrus Ecological Solutions LC, Logan, Utah.

BLM (U.S. Bureau of Land Management). 2023. Idaho BLM Explore Your Public Lands website: https://www.blm.gov/visit/maple-grove-campground Accessed April 13, 2023.

Aesthetics Study Plan

1. Introduction

Construction and operation of the proposed Oneida Pumped Storage Facility has the potential to introduce new features for which existing, relevant and reasonably available information is insufficient to address. One of these issues is the potential visual effects of Oneida Pumped Storage Facility features, operations, and maintenance on project vicinity aesthetic resources.

2. Background

PacifiCorp is preparing an application to amend the current license for their Bear River Project to add an upper reservoir and pumped storage capabilities to the Oneida Development. The proposed upper reservoir footprint, including construction roads, would occupy hundreds of acres and introduce new features into the view shed within the Oneida Canyon. The presence and areal extent of these new visual features is not currently known.

3. Study Goals and Objectives

The proposed study would obtain information needed to determine the potential degree of visibility and visual contrast of existing and proposed facilities, operations and maintenance, and recreation use in relationship to the Oneida Canyon vicinity aesthetic resources. The study goals include: (1) develop an inventory of the area aesthetic resources or landscape character; (2) review and summarize applicable visual management policies for the area; (3) assess the visual contrast between the proposed features and surrounding landscape; and (4) prepare visual simulations of the proposed pumping/generating station, penstock, and new upper reservoir, including access roads and transmission lines.

4. Study Area

The proposed study area includes the proposed upper reservoir footprint, penstock alignments, proposed pumping/generation station, and Oneida Reservoir shorelines. Key observation points will be publicly accessible portions along the Oneida Road downstream of Oneida Dam, in proximity to the existing dam, and from public recreation areas along Oneida Reservoir. Figure 1 in the recreation study shows the publicly available areas from which key observation points will be derived.

5. Methods

The aesthetic resources study will be based on review of available data and public policy documents as well as site reconnaissance and photo documentation completed in the field. The study will: 1) develop an inventory of the Oneida Canyon aesthetic resources or landscape character; 2) review and summarize applicable visual management policies for the area; and 3) assess the visual contrast between the proposed facilities and surrounding landscape. The study will include the following three tasks:

5.1 Task 1: Review of Existing Information and Data

This task would include the collection and review of existing sources of primary data to describe and evaluate the viewshed, in keeping with Visual Quality Objectives (VQOs) and other relevant

scenic quality policies and/or objectives. Data collection will include the following: topographic maps, aerial photographs, and pertinent visual quality background information, as well as technical data describing Project facilities, operations, maintenance, and recreation use. This task will also summarize agency management plans and policies relevant to visual resources including VQOs contained in BLM management policies, highway and road scenery management regulations and policies, and any trail or waterway designations. Consultation with agency staff, including representatives of the BLM, IDFG and IDEQ, regarding visual resource policies pertinent to the Oneida Pumped Storage Facility will also be conducted.

5.2 Task 2: Field Reconnaissance and Site Photography

This task includes site reconnaissance to observe and photograph Oneida Development facilities and the surrounding characteristic landscape. During site reconnaissance, key public viewing locations would be identified, and photo points established to photograph the Project area. Unique landscape units, key public viewpoints, and key public viewing areas (including seen areas and distance zones for Project features) will be identified and evaluated. The scenic attractiveness, scenic integrity, absorption capacity, and visual sensitivity of the landscapes in the proposed project area will be assessed.

5.3 Task 3: Aesthetic Resources Assessment

The surrounding landscape will be evaluated and, where applicable, policies, ordinances, and VQOs would be documented and evaluated for each proposed feature. Using a Geographic Information System (GIS), the VQOs and other relevant policies will be delineated on a map showing proposed features, as well as public recreation facilities. The Oneida Pumped Storage Facility's effects on visual resources, including visual contrast impacts, would be assessed. Information from this assessment would be used, if needed, to identify potential measures to reduce project-related visual contrast with the surrounding landscape.

6. Reporting

Verbal updates will be provided during monthly progress meetings for the project. A detailed technical report documenting the methods, analyses, and results of the study will be provided in draft form to PacifiCorp within 90 days of the end of the data collection phase. Following PacifiCorp review, the draft report will be distributed to participating agencies and stakeholders for comment. Comments will be addressed and incorporated into the final report to support the FERC license amendment.

Cultural Resources Study Plan

1. Introduction

Construction and operation of the proposed Oneida Pumped Storage Facility has the potential to introduce new features for which existing, relevant and reasonably available information is insufficient to address. One of these issues is the potential effects to cultural resources from project construction, operation, and maintenance on project vicinity resources.

The purpose of this study overview is to secure Collaborative Group review and input on the study scope and methodology. Based on that input, we will develop a comprehensive study plan to include in the Initial Consultation Document.

2. Background

PacifiCorp operates the Bear River Project including the Oneida Development according to its FERC License (Order issued December 22, 2003) and the Bear River Settlement Agreement. Specific to cultural resources, License Order Article 423 required PacifiCorp to implement the Programmatic Agreement among the FERC, Idaho State Historic Preservation Officer executed February 25, 2003, and including but not limited to the Historic Properties Management plan (HPMP) for the Project filed with FERC on March 30, 2005, and revised on August 10, 2007, and approved by FERC on June 17, 2008. Development of a new pumped storage project will require consulting with the proper parties and investigating the potential footprints of proposed infrastructure for cultural resources.

3. Study Goals and Objectives

The goal of this study is to collect information on cultural resources on lands within the proposed project area potentially impacted by construction and operation of the proposed pumped storage project to facilitate the evaluation of effects from project operation and maintenance activities on such identified resources under an amended license. To accomplish this goal, the study has the following objectives:

1) Consult with Idaho State Historic Preservation Office (ISHPO), Native American Tribes, and other consulting parties to define the area of potential effects (APE);

2) Conduct an intensive-level pedestrian survey of previously unsurveyed uplands to locate and document cultural resources within the footprint of potentially impacted lands—a survey of lands within the drawdown zone for the reservoir and around the powerhouse and related facilities already was previously completed;

3) Consult with the ISHPO, participating Native American Tribes, and other parties as appropriate to evaluate the National Register of Historic Places (National Register) eligibility all new cultural resource sites documented within the APE according to 36 CFR § 800.4.

4) Consult with the ISHPO, participating Native American Tribes and other parties as appropriate, to determine existing and potential project effects on the eligible cultural resources located and identified within the APE in accordance with 36 CFR § 800.5.

4. Study Area

Prior to conducting any field survey, PacifiCorp, once granted delegated authority for the Oneida Pumped Storage Facility, must consult with the ISHPO, Native American Tribes, and other consulting parties, under 36 CFR § 800.4(a)(1) to determine the area of potential effects (APE) for the action.[1] Typically for licensing or amending a license undertakings, that APE is defined as the limits of the FERC-regulated project boundary but may extend beyond that boundary to account for project effects. In this instance the APE will extend beyond the Oneida Project Boundary to include proposed facilities of the Oneida Pumped Storage Facility. PacifiCorp must then consult with these parties to define efforts that will be undertaken to make a good faith effort at identifying historic properties in the APE. This effort may include a combination of previous surveys conducted in the area and new surveys specific to this license amendment. PacifiCorp assumes at the present time that this consultation will result in agreement that the only portions of the APE/Project area that require new survey are the previously unsurveyed areas.

The study area for the cultural resource survey would comprise those within the proposed footprint of the upper reservoir, flowlines, transmission lines, access roads and pumping/generation station not previously inspected for cultural resources. Figure 1 presents the overall survey area and is based on 200-foot wide linear corridors and a quarter-mile buffer around the proposed upper reservoir.

5. Methods

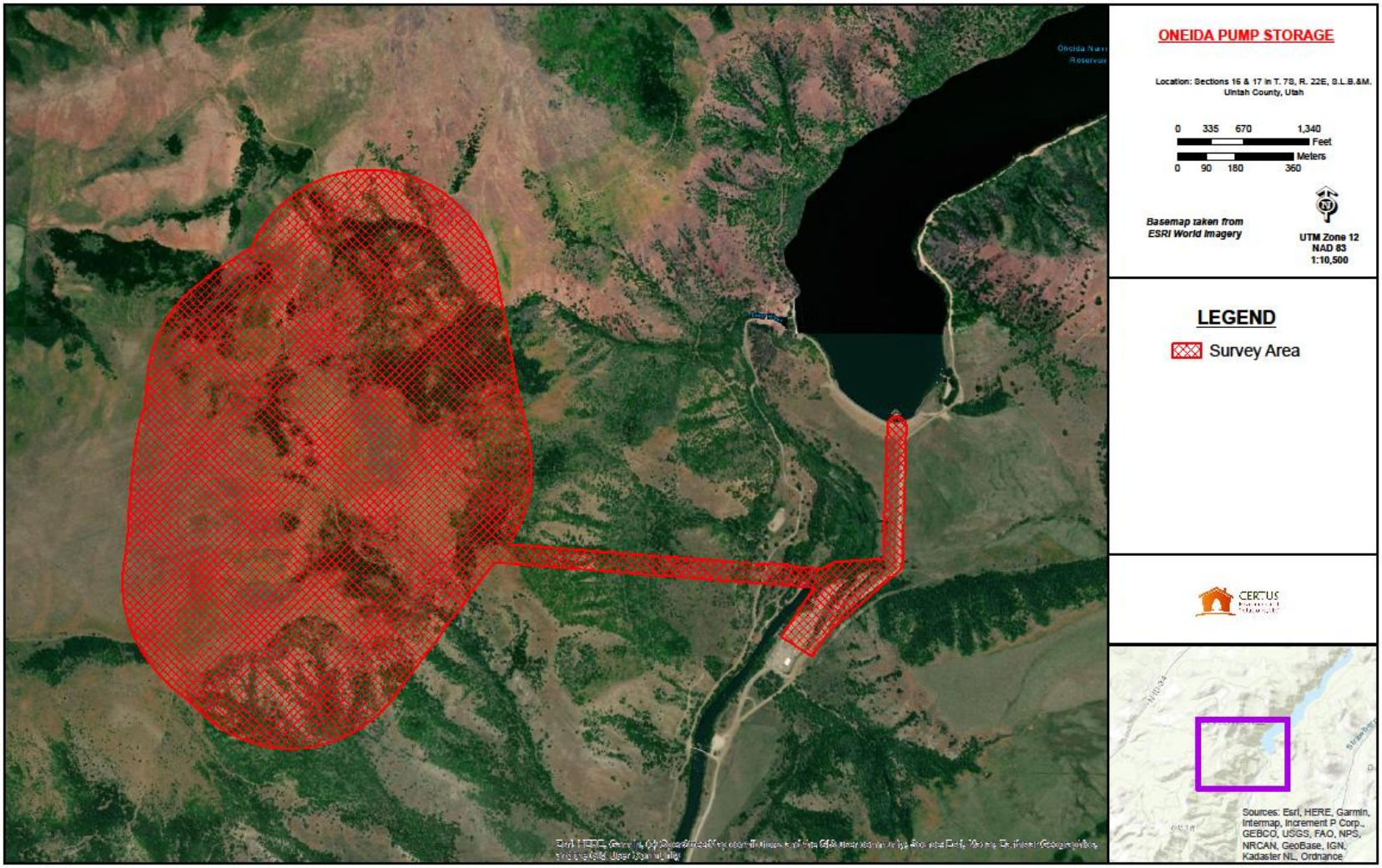
The field survey for cultural resources within the study area would consist of an intensive-level archaeological resources survey. No buildings or structures are known to be present in any of these areas, and, as such, no historical structures inventory would be conducted. The archaeological inventory methods would adhere to the ISHPO's standard survey transect spacing (no more than 30 m apart) and site documentation protocols in place at the time of the survey, unless the aforementioned consultation under 36 CFR § 800 results in an agreement to employ alternative survey methods (ISHPO, undated). Limited subsurface testing of identified archaeological sites in the newly surveyed upland areas would be undertaken if such testing is agreed upon during consultation. The nature and extent of such testing would be defined during consultation but could include a combination of shovel probes and formal excavation units.

[1] Area of Potential Effect is the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking (36 CFR § 800.16).

All sites documented during the new field survey would be evaluated for their National Register eligibility according to 36 CFR § 8004(b). Potential adverse effects from the Project on those resources qualifying as historic properties also would be carried out according to 36 CFR §800.5.

6. Reporting

A draft report of survey and testing results, if applicable, would be prepared and submitted to the ISHPO, Native American Tribes, and other consulting parties for review and comment according to 36 CFR § 800. The report would meet industry and ISHPO standards in place at the time of reporting. The draft report will be distributed to the above parties and other interested parties during the second or third quarter of 2024 for a 30-day period of review and comment. Comments on the draft report will be addressed and incorporated into the final report for inclusion in the draft and final license amendment applications.


ONEIDA PUMP STORAGE
Location: Sections 16 & 17 in T. 7S., R. 22E, S.L.B.&M.
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Basemap taken from
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Survey Area
CERTUS
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance

Appendix E – PacifiCorp's Fisheries Study Plan and IDFG's Response Letter

MEMO

DATE:	July 28, 2023
TO:	Dan Garren, Regional Manager, Idaho Department of Fish and Game (IDFG); and Patrick Kennedy, Regional Fisheries Manager, IDFG
CC:	Jot Splenda, Asst. Vice President/Hydropower Regulatory Lead, WSP; Jamie Campbell, PacifiCorp; and Eric Duffin, Asst. Project Manager, Cirrus.
FROM:	Mark Stenberg, Senior Operations Project Manager, PacifiCorp; and Justin Barker, Fisheries Biologist, Cirrus
RE:	Fishery survey outline for Oneida Reservoir and Bear River

We appreciate your taking the time to meet informally with us on July 19, 2023, to discuss the proposed Oneida Pumped Storage Hydroelectric (PSH) Development (Project) and the amendment application to extend the license for the Bear River Project, FERC Project No.20. This memo results from our discussion of the fisheries in the Bear River upstream and downstream of Oneida Reservoir and in the reservoir and your request that we consider further study of those fisheries to establish a baseline for assessing the effects of the proposed PSH development.

The Bear River and Oneida Reservoir have been intermittently sampled, with the most recent survey being completed in 2009 by Utah State University. You indicated the need for a survey to update that previous work but cited the lack of IDFG staffing, other high priority projects in the system, and the status of the agency's 2023 budget as reasons why IDFG could not undertake the needed study until 2024. Given the timelines for submitting a FERC amendment and the need for updated fisheries data to evaluate the project, our team believes the work can be completed this fall following American Fisheries Society standard methods for sampling north American freshwater fishes.

We propose to complete work in consultation with IDFG and conduct raft/boat electrofishing in the Bear River upstream and downstream of Oneida Reservoir. Within Oneida Reservoir, a combination of shoreline boat electrofishing and benthic gillnet surveys will be conducted in the fall of 2023. Data collected will include species (enumerated), length and weight. Results will be summarized as relative abundance (catch per unit effort), length frequency, relative weight, and proportion size/stock distribution for game fish. A preliminary draft study plan prepared by our contract team outlining the proposed work is attached.

FISHERIES STUDY PLAN OUTLINE

INTRODUCTION

PacifiCorp is studying the potential to amend the Bear River Project's FERC license to add pumped storage to the Oneida Development by constructing and operating a proposed Oneida Pumped Storage Hydroelectric Project (Project), which has the potential to affect fish populations in Oneida Reservoir and potentially the Bear River below Oneida Dam. Such impacts must be identified and disclosed as part of the amendment process, and that will require an updated baseline on fish populations in potentially affected waters.

The rationale for the study is to document fish populations in Oneida Reservoir and the Bear River upstream and downstream of the reservoir. The fishery study will inform PacifiCorp and regulatory agencies on the current condition of the fisheries, setting the stage for subsequent Project impact assessment for use in support of the Bear River Project FERC license amendment process.

BACKGROUND

IDEQ lists the Bear River upstream and downstream of Oneida Reservoir as not supporting the beneficial use designation of cold-water aquatic life/salmonid spawning. Idaho Department of Fish and Game (IDFG) manages Oneida Reservoir as a warmwater sport fishery and the Bear River segment below Oneida Dam as a nonnative put-and-take trout fishery.

The IDFG Thatcher Management Unit includes the Bear River from Grace Dam to Oneida Dam. No information is readily available for the fish assemblage downstream of Thatcher. Management efforts have centered on the PacifiCorp-funded hatchery program for Bonneville cutthroat trout.

Prior to 1980, Oneida Reservoir was dominated by yellow perch, which at times comprised over 90 percent of the fish numbers in the reservoir (Hardy et al. 2012). Walleye were initially stocked in 1976 and have been stocked more than 35 times since, with over 20 million fish being released to date. Walleyes are thought to be the most abundant sport fish currently in Oneida. Smallmouth bass were introduced upstream of Oneida Reservoir in 1991 and first documented in 2001 in the reservoir. Smallmouth bass have established a robust population in Oneida Reservoir and are currently considered the second most abundant warmwater sportfish. Based on past surveys, Utah sucker is the only native fish species currently documented in the reservoir.

The IDFG Riverdale Management Unit includes the Bear River from the base of Oneida Dam downstream to the Idaho-Utah border. Downstream of the Hwy 34 bridge near Riverdale, studies suggest the Bear River fishery is highly degraded, and most fishing occurs upstream (PacifiCorp, 1999). From Oneida Dam to Riverdale is approximately 11 river miles. Early studies (1974) showed the fishery was dominated by mountain whitefish (97 percent). Brown trout were introduced below Oneida Reservoir and were stocked from 1974 to 1998 (IDFG, 2022). Based on available records, stocking of rainbow trout began in 1985 and continues today (PacifiCorp, 1999). The Bear River below Oneida Dam is managed as a put-and-take fishery.

STUDY GOALS AND OBJECTIVES

The goals of this fisheries study are to (1) collect baseline information in Oneida Reservoir and the Bear River to document the existing fisheries in the Project area; (2) provide population estimates for fish in Oneida Reservoir, upstream of the Project in the lower part of the Gentile Valley and downstream of the Project in Oneida Narrows Canyon; and (3) establish a suitable baseline for determination of potential Project impacts on these fisheries. To reach these goals, the study has the following objectives:

1. Conduct electrofishing surveys in two reaches of the Bear River to estimate fish composition, population, and condition.
2. Conduct nighttime electrofishing surveys within the littoral zone of Oneida Reservoir and a combination of floating and sinking gill net surveys to estimate species abundance and composition.

STUDY AREA

The proposed fisheries study area includes two reaches of the Bear River immediately upstream and downstream of Oneida Reservoir, and in Oneida Reservoir (Figure 1). The upstream Bear River study reach is from Thatcher Bridge to the Highway 34 bridge just upstream of Oneida Reservoir, approximately 6.8 river miles in length. The study reach in Oneida Narrows Canyon begins at the bridge downstream of the powerhouse and ends immediately upstream of the BLM boater takeout, approximately 4.1 river miles in length.

METHODS

Bear River

The study will access the current fishery upstream and downstream of the Project by conducting mark and recapture sampling in the two proposed Bear River reaches. We propose to conduct the survey during the fall of 2023 when river flows are reduced to improve capture efficiency and when water temperatures have cooled to reduce fish stress.

The survey will use two boat-mounted electrofishing units to collect fish efficiently. It is anticipated that two marking runs will be completed in each reach to capture sufficient fish representing a variety of species. Dip nets will be used to remove stunned fish and placed then in oxygenated live wells. Fish processing will be conducted several times to limit stress and keep the marked fish within each reach. Recapture runs will be completed 7 to 8 days after the last marking run and will follow the same protocols.

During both mark and recapture runs, captured fish will be sedated with MS-222 then weighed (grams) and measured (total length and fork length; mm). Consultants will work with IDFG on appropriate marking techniques and locations for each run-day during the survey.

Relative abundance will be calculated for all species collected during the survey based on numerical abundance. Population estimates will be calculated using the Modified Peterson equation. Population metrics will be determined by reach and include all species per kilometer, number per square kilometer and biomass (kilograms per hectare). Structural parameters for each reach will include fish average length, average weight, length frequencies, average relative weight, measures of proportional stock density, and Fulton's condition factor for sport fish.

Oneida Reservoir

The reservoir study will be conducted concurrently with the study on the Bear River between marking and recapture runs in the fall of 2023. The survey will use a combination of methods to document species occurrence and relative abundance in Oneida Reservoir. Sampling will occur over a 5-night period using gillnets and electrofishing techniques. Gillnets will be placed in different locations nightly across the reservoir.

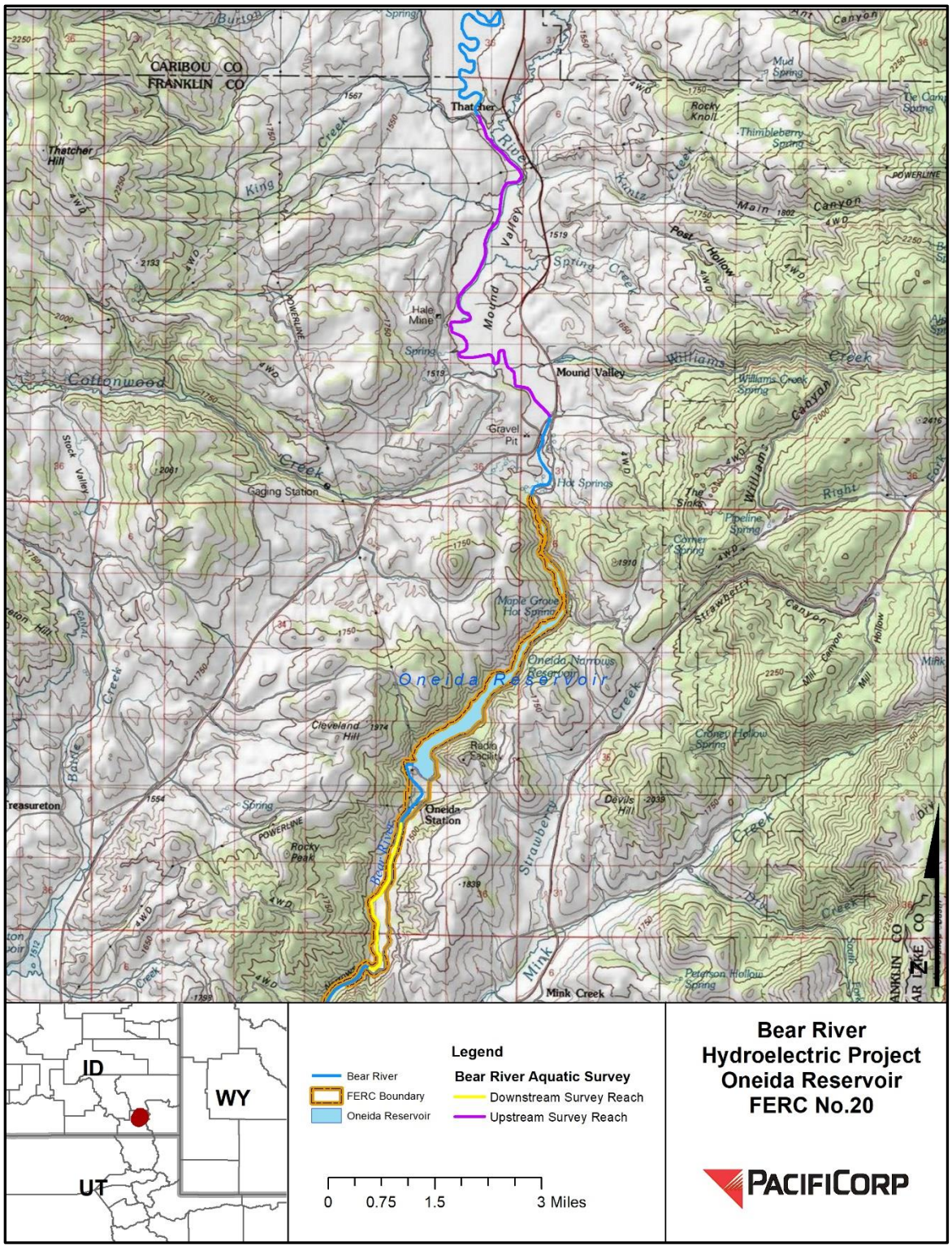

Figure 1. Proposed fish survey areas including Oneida Reservoir and Bear River segments upstream and downstream of the reservoir.

A combination of sinking (suspended) and floating experimental gillnets will be deployed in the reservoir. Nets will be set around sundown and retrieved early the following morning. Fish will be removed, placed in pens along the shoreline, weighed and measured as quickly as possible, then released. Experimental nets are proposed and will be either standard six-panel nets (125 ft x 6 ft) or 8-panel American Fisheries Society experimental gillnets (80 ft x 6 ft). Further consultation with IDFG will occur on appropriate nets and sizes for the survey.

Nighttime electrofishing is proposed in the littoral zone of the reservoir. Using two boats with boat-mounted electrofishing equipment, the shoreline will be surveyed in segments, with 1 hour of shocking per boat per night. Dip nets will be used to remove stunned fish that will be placed in oxygenated live wells, sedated, weighed and measured then released. Further consultation with IDFG will confirm sampling locations.

Relative abundance and percent biomass will be calculated for all species collected during the survey based on numerical abundance. Catch per unit effort will be calculated for the survey. Structural parameters for each reach will include fish average length, average weight, length frequencies, average relative weight, proportional stock density, and Fulton's condition factor for sport fish.

REPORTING

A detailed technical report documenting the methods, analyses, and results of the study will be provided in draft form to PacifiCorp within 90 days of the end of data collection.

Following PacifiCorp review, the draft report will be distributed to participating agencies and stakeholders for comment. Comments will be addressed and incorporated into the final report to support the license amendment process.

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Proposal for additional fisheries evaluations to be included in the amendment to Bear River Settlement Agreement

Bear River Hydroelectric Project
FERC Project No. 20

Prepared by:
Idaho Department of Fish and Game

Submitted to:
PacifiCorp and the Environmental Coordination Committee

August 14, 2023

INTRODUCTION

An estimated 26% of historical Bonneville Cutthroat Trout (BCT) distribution in Idaho is occupied by core/conservation populations (meaning ≥ 90% purity; IDFG 2022). These conservation populations in Idaho accounted for an estimated 49% of the current BCT distribution throughout their range. This identifies how important the Bear River BCT general management unit (GMU) is to the subspecies. However, within their distribution in Idaho, the population status is unknown for 42% of this area. This shortcoming was identified in both Idaho Department of Fish and Game's (IDFG) BCT management plan (IDFG 2022) and the BCT conservation strategy (UDWR 2019). Current monitoring efforts for BCT in the Bear River GMU are not adequate to evaluate persistence or inform conservation management strategies to successfully recover BCT in the Bear River. During the public comment period for IDFG's BCT management plan, partners emphasized the need for more rigorous evaluations. One of IDFG's regional fisheries biologists has been committed to Bear River Settlement Agreement (BRSA) articles and the Environmental Coordination Committee (ECC) projects. Specifically, this biologist was focused on stream habitat restoration including screening irrigation diversions to reduce entrainment and the BCT conservation aquaculture program. Evaluating PacifiCorp's impacts to recreational fisheries and BCT conservation in the Bear River have been neglected or have been completed at a cursory level. This is likely because, despite the articles of the BRSA identifying the need for BCT restoration plan, there were no provisions or funds allocated to routine BCT evaluations. Regarding recreation, IDFG has mitigated for lost angling opportunities by supplementing fish populations, where PacifiCorp has primarily mitigated for lost boating opportunities.

We lack fisheries evaluations to thoroughly describe population trends and distributions, or progress toward mitigation/conservation goals. As stated in IDFGs BCT conservation management plan, evaluations are a necessary prerequisite to identify conservation measures. Despite the significant amount of work that has been completed through the ECC, trends in BCT abundance indicate that little has changed since the BRSA was initiated. I believe that signatories to the BRSA and PacifiCorp share common goals to ensure that that the Bear River and associated reservoirs continue to provide quality recreational angling opportunities and that BCT persist into the future.

Threats from the Project

The Bear River Hydroelectric Project (hereafter Project) has contributed to reduced BCT population abundance and continue to limit BCT recovery, through a large portion of their range in Idaho. Hydroelectric dams have substantial negative effects to rivers and associated aquatic fauna by fundamentally altering their ecosystems. Mechanisms that deleteriously impacted BCT in Idaho include directly limiting upstream fish passage, direct mortality through turbine strikes, increasing summer water temperatures which indirectly limit fish passage, seasonally reducing river discharges which reduces habitat availability, decreasing river channel complexity, reducing sediment and substrate transport, dilution of thermal refugia, and subsequent impacts to the food web and reducing genetic diversity.

Inherently, dams alter the natural hydrological and physical characteristics of the Bear River that BCT are adapted to. Flow magnitudes are seasonally reduced and move the peak discharges away from optimal periods when peak discharge might support natural BCT spawning or migrations. Dams also reduce available flow by increasing evaporative losses (Allen 1995). During the non-irrigation season, Bear River surface flows are reduced to increase storage, reducing habitat quantity and quality for BCT. In the late-winter or early-spring, water may be moved through the Project to make space for winter snowmelt. The overall result is that river discharge in various river reaches is higher than natural during some periods and lower than natural during other periods. Peak runoff in the Bear River upstream of Grace Dam has been shifted to July, causing higher summer discharge and lower spring discharge, which is much later and no longer coincides with the BCT spawning period. Additionally, higher summer discharges dilute thermal refugia important for BCT when water temperatures are highest.

In the Bear River, perhaps the most significant factor inhibiting BCT recovery is due to limited habitat availability caused by increased water temperatures. The small, shallow reservoirs associated with the Project increase water temperatures throughout the Bear River through increased solar loading when water residence time is increased in the reservoirs (Chandesris et al. 2019). Small, shallow, reservoirs increase water temperatures relative to the river inflow temperatures, and do not thermally stratify. Epilimnetic releases of surface water downstream spatially compound the problem by increasing water temperatures downriver. Thermal stratification of a reservoir creates a cooling opportunity in the river downstream through hypolimnetic (bottom) releases of water. Hypolimnetic releases of water downstream, where reservoirs are large enough to stratify such as Oneida Reservoir, could have provided benefits to BCT downriver in the Riverdale BCT management unit. Hypolimnetic releases at Oneida were chosen for some period but were discontinued later and epilimnetic releases were chosen instead, likely limiting coldwater species, and benefiting non-native aquatic species. Where cold water releases could have provided significant benefits downstream from Oneida Dam, the proposed Oneida Pumped Storage Hydroelectric Development will likely eliminate the thermal stratification of the reservoir eliminating this opportunity in the future. Previous studies (Oasis Environmental 2010) identified that water temperatures in the Bear River have increased and often exceed 22° C; the coldwater aquatic life (i.e., BCT) beneficial use threshold established by the Idaho Department of Environmental Quality. Due to the previously described increased summer discharges by the Project, the habitat availability for BCT is limited by Project actions during a period when thermal refugia is essential (Hillyard and Keeley 2012). Reservoir and river temperatures that exceed BCT thermal tolerances create thermal migration barriers, limit available habitat, and decrease BCT growth and survival. Thermal barriers have fragmented BCT habitat and decreased migration opportunities, decreased the existence of migratory life-histories (i.e., fluvial BCT), causing patchy population distributions that are isolated from one another. Fragmented populations have

increased risk for extirpation (Hilderbrand and Kershner 2000; Harig and Fausch 2002) because populations then incur reduced genetic diversity and reduced ability to adapt to environmental threats (Lande 1995; Morris and Doak 2002), which reduces their likelihood of persistence. Additionally, Colyer et al. (2005) note that populations with limited migratory capabilities with decreased ranges and habitat types may be more vulnerable to the impacts from non-native fishes, emphasizing the importance of mitigating the impacts from passage barriers.

Additional Threats to BCT

There are other factors that limit the recovery of BCT in the Bear River, such as non-native species, and legacy impacts from farming and ranching practices. Through the ECC's collaborative efforts, some impacts from farming and ranching practices have been mitigated, where irrigation fish screens have been installed to reduce entrainment and stream habitat has been rehabilitated to mitigate legacy impacts from grazing. However, mitigation has not focused on impacts directly resulting from the Project and may not have addressed limiting factors. Consequently, recent evaluations of BCT trends (IDFG 2022) suggest that there are few measurable benefits toward the recovery of BCT at trend monitoring sites. Trend analyses for BCT populations suggests that most populations were stable or unchanged. In other words, there have not been measurable benefits that might have been expected from past mitigation efforts. Trends for non-native species were estimated to be decreasing at monitoring sites.

Conservation Aquaculture

The conservation aquaculture program has addressed significant challenges with avian predation, poor water quality of broodstock ponds, and the development of standardized practices to spawn and rear progeny of wild fish in a domesticated scenario. Kackley Springs is perhaps the best evidence of how this program can provide successful outcomes. At Kackley Springs, significant stream habitat restoration was completed, non-native species were removed, and the fluvial life-history has been maintained through a trap/weir project. Subsequent stocking of BCT from the conservation aquaculture program has resulted in increased trends of abundance at the monitoring sites at Kackley Springs and it supports a recreational fishery. However, Cottonwood Creek, the broodstock source for the program, is declining in abundance and the size of individuals has decreased so that we can no longer meet the objective of 20,000 BCT to distribute. Some benefits from this program have been identified where recent survey data identified multiple year classes of stocked BCT are persisting in Trout Creek. Though little natural production was identified suggesting that if the supplementation of this Creek was discontinued, then BCT would die off. Additional work is needed to identify and address limiting factors in Trout Creek to maintain the high potential that currently exists.

Recreational Angling

Recreational angling opportunities have declined throughout the Project area, where BCT are not abundant enough to provide good catch rates in most reaches. Project operations have inundated miles of river habitat and created new reservoir fisheries that we now manage. Reservoir water temperatures are typically too high to support the adfluvial life-histories of BCT. Similarly, high water temperatures have decreased the Bear River habitat suitability for BCT to thrive in high enough abundances to be a target species for anglers. IDFG has supplemented depauperate reaches of the Project with non-native species that may be better adapted to the degraded aquatic environment in an effort to mitigate these lost angling opportunities. Populations of Brown Trout, Smallmouth Bass, Channel Catfish, and Walleye have been

established and are now naturally recruiting to the fisheries. Additionally, catchable-sized, sterile Rainbow Trout are routinely stocked in select reaches to provide put-and-take opportunities for angler harvest. The proposed Oneida Pumped Storage Hydroelectric Development would likely negatively impact angling opportunities within the reservoir and the river reaches upstream and downstream as well. These new impacts need to be evaluated. To evaluate these new impacts we first need to better understand the fish assemblages there through inventories, population demographics, and trend monitoring. Once mitigation actions are determined, then continued fisheries evaluations will determine the effectiveness of mitigation actions and adaptive management strategies to improve recreational angling.

Many of the ECCs mitigation efforts were aimed at benefiting BCT in the Bear River. When the ECC was formed, an explanatory statement was published for the Bear River Settlement Agreement (PacifiCorp 2002). In the explanatory statement section VI. A. Aquatic Resources, it was stated that "…restoration of river processes, water quality, and habitat conditions should be the first step in mitigating effects of the Bear River Project" and that a restoration plan would be developed. This restoration plan would "…provide a framework for the long-term protection, mitigation, and enhancement of habitats necessary to the persistence of BCT in the Bear River drainage." Further, it went on to describe "…actions that are identified in the restoration plan will address the elimination or reduction of threats to the species' survival." My interpretation is that the BRSA identified limiting factors resulting from the Project and had the intent of addressing those limiting factors. Despite this, past efforts did not address Project impacts in the main stem Bear River, and factors limiting BCT, and I think this is confirmed through recent trend analyses that identify little has changed. The restoration plan identified a lack of data in many aspects, including evaluations of BCT populations and migration barriers. In the most recent BCT management plan (IDFG 2022) many of the specific data limitations remain all these years later with status for many tributaries listed as "unknown", and still many listed as "extirpated". Therefore, PacifiCorp has not provided the ECC necessary information to gage progress toward common goals for mitigating the impacts from the Project and for BCT persistence. The following seven objectives will provide the information necessary to reliably describe the viability of the BCT subspecies in the Bear River and to routinely evaluate progress toward other common goals.

STUDY AREA

The Bear River Hydroelectric Project including the Bear River and reservoirs associated with Soda, Grace, and Oneida dams. This includes the BCT subspecies range throughout tributary drainages within the Pegram, Nounan, Dam Complex, Thatcher, and Riverdale BCT management units. This could include the BCT subspecies range within the Bear River drainage including Bear Lake, and other native endemic fish species within Bear Lake if the Project expands to Dry Canyon.

OBJECTIVES

1) Evaluate abundance of native and non-native species
2) Evaluate distribution of native and non-native species
3) Evaluate trends in abundance and distribution for native and non-native species
4) Evaluate BCT genetic diversity and introgression with Rainbow Trout
5) Evaluate growth, survival, and recruitment of BCT populations
6) Reintroduce BCT where appropriate
7) Evaluate reservoir fisheries (i.e., species comp., growth by species, survival by species)

METHODS

Abundance and distribution of native and non-native fish

To evaluate abundance in tributaries, standard backpack electrofishing depletion estimate methods will be used. Electrofishing teams will consist of one person with a backpack electrofisher and one person with a net and bucket. When stream widths exceed 3 m, we will use two backpack electrofishing units and an additional netter. We will plan three passes at each site, unless we encountered zero fish on the first pass. If we captured fish on the first pass, we completed subsequent passes until we captured < 50% of the prior pass, regarding trout > 75 mm. We will utilize natural transitions between pools and riffles instead of block nets and adjust site lengths accordingly, with a target reach length of approximately 100 m (± 20). All fish will be captured, will be identified to species or subspecies, measured for total length (mm), and weighed to the nearest gram.

We will select sites using a stratified random design, where the length that the stream order composed of the entire tributary determine the number of sites selected in each stream order. During random selection of sites, we will first identify all the potential 100-m reaches in the drainage at the 1:24,000 scale using Forest Service maps in ArcGIS. To maximize precision of the drainage-wide estimate, we will limit the number of sites in first order streams known to be intermittent, and proportionally increased the number in perennial first order, second order, and third order streams (Meyer et al. 2006). We will estimate the proportion of stream length (m) in first order intermittent, and perennial first order, second order, and third order streams from 1:24,000 Forest Service maps. We will then weigh the number of sites by stream order proportionally and use a random number generator to select sites from all available 100-m reaches in each stream order.

To estimate distribution, we will initially plan to survey all randomly selected sites. During surveys we will survey upstream until two consecutive sites are determined to be absent of fish. At that point the upstream longitudinal distribution of fish will be identified, and any additional selected sites will not be surveyed. When we replicated the drainage-wide survey, we will sample all sites that previously had fish, and one additional site further upstream to identify the extent of distribution. We will calculate the drainage-wide estimate of abundance (fish > 70 mm) and associated variances using the stratified-random-sampling formulas in Schaeffer et al. (1996).

Mainstem abundances will be conducted using boat or barge electrofishing and mark/recapture abundance estimation methods. Representative reaches (n = 2 to 5) will be selected in each management unit. Surveys will be completed on an annual cycle through the licensing process, then will be surveyed on a triennial cycle with. Reservoirs surveys will be completed at the same frequency as the mainstem Bear River and will follow IDFG's standard lowland lake survey protocol (IDFG 2012).

BCT Genetic Diversity and Introgression

Tissue samples (caudal fin clip) will be obtained from BCT during routine surveys of abundance and distribution. A goal of 100 tissue samples per population will be sought and maintained on Whatman paper. A random sample of at least 30 tissue samples will be genotyped to evaluate introgression with

Rainbow Trout, where the threat exists. All samples will be archived at IDFG's Eagle Fish Genetics Laboratory for future assessment of genetic diversity. When the archive of Bear River BCT population is mature, then analyses can be performed to evaluate the introgression rates with Rainbow Trout, and the diversity and relatedness of individual BCT populations.

BCT Growth, Survival, and Recruitment

Growth will be evaluated using length-frequency histograms; and where populations are sufficiently robust, otoliths will be removed and assessed for age. Combining lengths, weights, and ages will provide estimates of demographic characteristics including length-at-age, von Bertalanffy growth, survival, and cohort analyses will describe recruitment to the subsequent year-class. These evaluations are only necessary at five-year intervals, but baselines should be established for comparison before the next license period.

Evaluating Trends

Trends in abundance will follow the methods used in the past (Gerrodette 1987; IDFG 2022) to describe intrinsic rates of change. Trends in distribution will be evaluated through mapping exercises describing the most recent distributions of BCT to past estimates of distribution.

Reintroduce BCT

Additional reintroductions will be established where suitable habitat is identified and where BCT status is defined as extirpated, to expand their current range. Standardized protocols for spawning/rearing will be continued by the Grace Hatchery staff. Post-release survival will be evaluated through backpack electrofishing surveys described above. Size-at-release, release locations, and release timing will be adaptively managed to maximize recruitment to adulthood (age-3).

DISCUSSION

Major impacts to BCT habitat and connectivity were incurred around the early 1900s, and many of those impacts remain today, limiting recovery. The Bear River GMU of BCT is considered a stronghold for the subspecies (WNTI 2018), though hydropower development remains a major threat to persistence (IDFG 2022). If environmental conditions deteriorate, providing additional impacts to these small, fragmented populations, their persistence could be seriously threatened. It is imperative that additional attention be placed on this GMU to ensure the persistence of this subspecies. In the 1970s, it was thought that this subspecies was extirpated in Idaho, though increased attention through population surveys identified otherwise. That scenario emphasizes the importance of routine population evaluations. Still, every status assessment, management plan, restoration plan, or conservation strategy continues to list the need for improved population evaluations.

In the early 2000s, IDFG began monitoring BCT populations through routine surveys. These surveys have provided some information to estimate trends, and gage success toward BCT recovery. However, due to funding and staffing limitations, survey efforts only provide a cursory level of inference.

Current surveys only describe BCT at a limited number of sites, and inferences can only be made at the site level. Trends may not be reliable at broader scales such as the smaller population level or management units. To evaluate trends for populations and management units, a greater number of survey sites needs to be selected randomly over a larger spatial scale. The current funding and analyses suggested that at sites, general trends of BCT are stable, but have not responded to mitigation efforts by increasing trends. Considering the high importance of these BCT populations to the sub-species and the Project operations, I think a more thorough assessment could be important to identifying successes from mitigation efforts and to ensure the persistence of the subspecies.

Through PacifiCorp, the ECC has completed a significant amount of work for BCT in Idaho, though trends in abundance suggest that conservation efforts have been insufficient to improve overall status in Idaho's portion of the Bear River and its tributaries. Perhaps the populations have not responded to these conservation efforts because efforts did not significantly address factors limiting BCT. Addressing factors limiting BCT populations will most likely result in increased trends in abundance and distribution in the future. Strategically identifying factors limiting BCT will most effectively be completed through additional population evaluations. Subsequently, progress toward the successful recovery of BCT can only be gauged through additional population evaluations.

Bear River reservoirs in Idaho have been successfully supplemented with fish populations by IDFG to mitigate lost recreational fishing opportunities from the Project. The fisheries adjacent to and including Oneida Reservoir will likely suffer significant changes from upcoming hydropower developments. Fisheries evaluations need to occur in the Bear River, upstream and downstream and within Oneida Reservoir to establish baselines and to identify strategies to mitigate reduced recreational angling opportunities. Surveys in these reaches and others need continued monitoring throughout the license period to evaluate progress toward mitigation goals and to identify adaptive management strategies.

To achieve the goal of increasing BCT population and recreational angling evaluations, we request funding through PacifiCorp to support two biologists, temporary staff, and operating expenses (Appendix A.). Through the past Bear River Settlement Agreement, PacifiCorp has a long history of supporting staff for the conservation aquaculture project and the irrigation fish screening project. This funding is necessary to strategically identify conservation efforts and gage progress towards common goals.

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Appendix A. Current and Proposed Funding Through PacifiCorp's Bear River Settlement Agreement

Current funding:

PacifiCorp Screens (base)

Personnel	Position	Months	Wage($/hr.)	Total
	Technician	8	16.90	
Personnel total				$33,860
Operating total*				$10,000
PacifiCorp Screen overall total (base)				$43,860

Conservation Aquaculture

Personnel	Position	Months	Wage($/hr.)	Total
	Biologist	10	31.74	
	Hatchery Mgr	2	28.51	
	Hatchery Asst. Mgr.	2	22.72	
	Technician	7	16.9	
Personnel total (including overhead)				$111,525
Operating total				$33,000
Conservation aquaculture overall total				$144,525
- needs additional enhancements through ECC grants				

Current annual funding total (base*)	**$188,385**

* not including enhancements through ECC grants

IDFG contributions currently include:

- Hatchery Stocking of Rainbow Trout and Walleye
- Office space
- Office equipment
- Travel expenses
- Two pickups and associated operating expenses
- Biologist (4 mo.) time for screens
- All operating expenses for screens
- Many operating expenses for conservation aquaculture
- Administrative time (4 mo. Fisheries Manager; 1 mo. RS time; 4 mo. HQ time; 1 mo. Rec. Site Foreman; OSS/front office time; 3 mo. Technical Assistance)
- BCT monitoring crew
- Report review and development

Proposed additions:

Fisheries Evaluations				
Personnel	Months	Wage($/hr.)	Salary ($/yr.)	Totals
Biologist	24	29.0	178,000	
Fisheries Tech.	16	16.9	74,000	
Fisheries Bioaide	8	16.9	30,000	
Hatchery Tech.	4	16.9	15,000	
Personnel total				$297,000
Operating total				$70,000
Total for proposed additions (New Ask)				$367,000
PacifiCorp Screens (operating only)				$10,000
Conservation Aquaculture (maintained)				$144,525
Proposed annual total				**$521,525**

IDFG Proposed Contributions:

- Administrative time (6 mo. Fisheries Manager; 1 mo. RS time; 4 mo. HQ time; 1 mo. Rec. Site Foreman; OSS/front office time; 3 mo. Technical Assistance)
- Data QA/QC; survey design and implementation review
- Office space and support for 2 FTE + 4 Techs
- Sampling equipment and upkeep
- Genetic analysis (staff time, equipment, reporting)
- Report development review and publishing including online access
- Fleet (pickups) management