ENVIRONMENTAL ASSESSMENT
FOR HYDROPOWER LICENSE

Weber Hydroelectric Project
FERC Project No. 1744-041
Utah

Federal Energy Regulatory Commission
Office of Energy Projects
Division of Hydropower Licensing
888 First Street, NE
Washington, DC 20426

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS AND ABBREVIATIONS

ABA	Architectural Barriers Act
Advisory Council	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
ALP	Alternative Licensing Process
APE	area of potential effects
APEA	Applicant Prepared Environmental Assessment
APLIC	Avian Power Line Interaction Committee
Applicant	PacifiCorp
AU	water quality assessment units
BCT	Bonneville cutthroat trout
BMPs	Best Management Practices
BOD	Biological Oxygen Demand
BOR	Bureau of Reclamation
°C	degrees Celsius
CFR	Code of Federal Regulations
cfs	cubic feet per second
CRMP	Cultural Resources Management Plan
Commission	Federal Energy Regulatory Commission
CWA	Clean Water Act
DO	dissolved oxygen
DWCCC	Davis and Weber Counties Canal Company
EA	Environmental Assessment
ECOS-IPaC	Environmental Conservation Online System – Information for Planning and Consultation
ESA	Endangered Species Act
Forest Service	U.S. Department of Agriculture, U.S. Forest Service
fps	feet per second
FPA	Federal Power Act
FR	Federal Register
FWG	Fisheries Working Group
FWS	U.S. Department of Interior, U.S. Fish and Wildlife Service
HPMP	Historic Properties Management Plan
I-84	Interstate 84 freeway
kV	kilovolt
kW	kilowatt
MOA	Memorandum of Agreement
MW	megawatt

MWh	megawatt hour
NFS	National Forest System
National Register	National Register of Historic Places
NAVD-88	North American Vertical Datum of 1988
NHPA	National Historic Preservation Act
NRCS	National Resources Conservation Service
NTUs	Nephelometric Turbidity Units
PIA	passive instream arrays
PIT	passive integrated transponder tags
Project	Weber Hydroelectric Project
PM&E	protection, mitigation & enhancement measures
SHPO	State Historic Preservation Office
SSURGO	Soil Survey Geographic Database survey data
STATSGO	State Soil Geographic soil survey database
SWCA	SWCA Environmental Consultants
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UPRC	Union Pacific Railroad Company
Utah DEQ	Utah Department of Environmental Quality
Utah DNR	Utah Department of Natural Resources
Utah DOT	Utah Department of Transportation
Utah DWQ	Utah Division of Water Quality
Utah DWR	Utah Division of Wildlife Resources
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
USU	Utah State University
UWCNF	Uintah-Wasatch-Cache National Forest
WECC	Western Electricity Coordinating Council
WQC	water quality certification

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1.0 INTRODUCTION

1.1 APPLICATION

On May 30, 2018, PacifiCorp filed an application with the Federal Energy Regulatory Commission (Commission or FERC) for a new license to continue operating the Weber Hydroelectric Project No. 1744 (Weber Project or project).[1] The 3.85-megawatt (MW) project is located on the Weber River near the City of Ogden in Weber, Morgan, and Davis Counties, Utah (Figure 1). The project occupies 15.51 acres of federal land managed by the U.S. Forest Service (Forest Service) in the Uintah-Wasatch-Cache National Forest (UWCNF).

1.2 PURPOSE OF ACTION AND NEED FOR POWER

1.2.1 Purpose of Action

The purpose of the Weber Project is to provide a source of hydroelectric power. Therefore, under the provisions of the Federal Power Act (FPA), the Commission must decide whether to issue a new license to PacifiCorp for the Weber Project and what conditions should be placed on any license issued. In deciding whether to issue a license for a hydroelectric project, the Commission must determine that the project will be best adapted to a comprehensive plan for improving or developing a waterway. In addition to the power and developmental purposes for which licenses are issued (such as flood control, irrigation, and water supply), the Commission must give equal consideration to the purposes of: (1) energy conservation; (2) the protection, mitigation of damage to, and

[1] The original license for the project was made effective January 1, 1938, and expired June 30, 1970. The Commission issued a license annually for a period from June 30, 1970 to June 28, 1990, due to a dispute with a nearby municipality that sought to acquire the project. The Commission issued the current license on June 28, 1990, with an effective date of June 1, 1990, for a term of 30 years, which expires on June 1, 2020. *See* 51 FERC 62,316 (1990).

Figure 1. Location of the Weber Hydroelectric Project P-1744. (Source: PacifiCorp 2018b, as modified by staff).

enhancement of fish and wildlife resources; (3) the protection of recreational opportunities; and (4) the preservation of other aspects of environmental quality.

Issuing a new license for the Weber Project would allow PacifiCorp to generate electricity at the project for the term of the license, making electric power from a renewable resource available to the regional grid.

This environmental assessment (EA) assesses the environmental and economic effects associated with continued operation of the project, alternatives to the project, and makes recommendations to the Commission on whether to issue a new license, and under what terms and conditions to issue a license.

In this EA, we assess the effects of operating and maintaining the project: (1) as proposed by PacifiCorp, (2) with our recommended measures, and (3) with any mandatory conditions prescribed by state and federal agencies. We also consider the effects of a no-action alternative. The primary issues associated with relicensing the project are the effects of proposed construction and continued operation on aquatic, terrestrial, land use, aesthetic, and recreational resources.

1.2.2 Need for Power

The project has an installed capacity of 3.85 MW and an estimated average annual generation of 16,926 megawatt-hours (MWh). Under a new license, the Weber Project would continue to provide hydroelectric generation to meet part of Utah's power requirements, resource diversity, and capacity needs.

Because the project is located in the Northwest Power Pool area of the Western Electricity Coordinating Council (WECC), we looked at the regional need for power as reported by WECC to anticipate how the demand for electricity is expected to change in the region. For the period from 2019 through 2028, WECC's 2018 Long-Term Reliability Assessment forecasts the need for over 4,000 megawatts of new power resources to maintain adequate capacity reserves in the assessment area.

The Weber Project would continue to meet part of the existing load requirements within a system in need of resources. The project also provides power that displaces generation from non-renewable sources. Displacing the operation of non-renewable facilities may avoid some power plant emissions, thus continuing an environmental benefit.

1.3 STATUTORY AND REGULATORY REQUIREMENTS

Any new license for the Weber Project would be subject to numerous requirements under the FPA and other applicable statutes. The major regulatory and statutory requirements are described in the following sections.

1.3.1 Federal Power Act

1.3.1.1 Section 18 Fishway Prescriptions

Section 18 of the FPA states that the Commission must require construction, maintenance, and operation by a licensee of such fishways as may be prescribed by the Secretaries of Commerce or the U.S. Department of the Interior. No fishway prescriptions or requests for reservation of authority to prescribe fishways were filed under section 18 of the FPA.

1.3.1.2 Section 4(e) Conditions

Section 4(e) of the FPA provides that any license issued by the Commission for a project within a federal reservation shall be subject to and contain such conditions as the Secretary of the responsible federal land management agency deems necessary for the adequate protection and use of the reservation. The Forest Service filed final conditions on December 17, 2018, pursuant to section 4(e) of the FPA. These final conditions are described under section 2.2.5, *Modifications to Applicant's Proposal—Mandatory Conditions* and included in Appendix B.

1.3.1.3 Section 10(j) Recommendations

Under section 10(j) of the FPA, each hydroelectric license issued by the Commission must include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, or enhancement of fish and wildlife resources affected by the project. The Commission is required to include these conditions unless it determines that they are inconsistent with the purposes and requirements of the FPA or other applicable law. Before rejecting or modifying an agency recommendation, the Commission is required to attempt to resolve any such inconsistency with the agency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency. No recommendations were filed pursuant to section 10(j) of the FPA.

1.3.2 Clean Water Act

Under section 401(a)(1) of the Clean Water Act (CWA), 33 U.S.C. § 1341(a)(1), a license applicant must obtain either a water quality certification (certification) from the

appropriate state pollution control agency verifying that any discharge from the project would comply with applicable provisions of the CWA, or a waiver of such certification. A waiver occurs if the state agency does not act on a request for certification within a reasonable period of time, not to exceed one year after receipt of such request.

On December 4, 2018, PacifiCorp applied to the Utah Department of Environmental Quality (Utah DEQ) for section 401 certification for the project. Utah DEQ received this request on December 13, 2018. On April 24, 2019, Utah DEQ timely issued a certification for the project. These conditions of the certification are described under section 2.2.5, *Modifications to Applicant's Proposal—Mandatory Conditions* and included in Appendix C.

1.3.3 Endangered Species Act

Section 7 of the Endangered Species Act (ESA), 16 U.S.C. § 1536, requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered species or result in the destruction or adverse modification of the critical habitat of such species.

Three federally threatened species were identified as potentially occurring in the vicinity of the project. The Ute ladies'-tresses orchid (*Spiranthes diluvialis*) was identified by PacifiCorp in its license application, and the Canada lynx (*Lynx canadensis*) and yellow-billed cuckoo (*Coccyzus americanus*; Western U.S. distinct population segment) were identified in the official species list for the project.[2] No designated critical habitat was identified in the vicinity of the project.

Our analysis of potential project effects on the federally listed species is presented in section 3.3.4, *Threatened and Endangered Species*. Based on our analyses, we conclude that continued operation of the Weber Project, as provided for in the staff alternative with mandatory conditions, would have no effect on the Ute ladies'-tresses, Canada lynx, or yellow-billed cuckoo, and no further action under the ESA is required.

1.3.4 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA) requires that federal agencies "take into account" how each of its undertakings could affect historic properties. Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and

[2] The official species list was generated by staff on FWS's ECOS-IPaC website on December 6, 2019, and filed on December 9, 2019.

culture that are eligible for inclusion in the National Register of Historic Places (National Register).

Commission staff designated PacifiCorp as its non-federal representative for the purposes of conducting section 106 consultation under the NHPA on August 3, 2015. Pursuant to section 106, and as the Commission's designated non-federal representative, PacifiCorp consulted with the Utah State Historic Preservation Office (SHPO) to identify historic properties, determine National Register eligibility, and assess potential adverse effects on historic properties within the project's area of potential effects (APE). The results of PacifiCorp's cultural resources investigations indicate that no historic properties would be affected by the proposed relicensing of the project. In a letter dated December 16, 2016, and filed on April 20, 2018, the Utah SHPO concurred with PacifiCorp's determination, but stated that additional consultation with them would be needed if further work is undertaken by PacifiCorp, such as the construction of a new fish ladder, to address any potential effects to existing historic properties. PacifiCorp filed a revised historic properties management plan (HPMP) on May 18, 2018, that provides consultation procedures regarding the proposed construction of a new fish ladder and new vault toilet facility.

Our analysis in section 3.3.7 of this EA concludes that PacifiCorp's revised HPMP provides adequate consultation procedures to avoid or resolve any potential adverse effects to historic properties from constructing the proposed new project facilities. We also concur with the Utah SHPO's initial finding that relicensing the project would not have an adverse effect to historic properties conditioned on further consultation with the Utah SHPO as provided in PacifiCorp's revised HPMP.

1.4 PUBLIC REVIEW AND COMMENT

The Commission's regulations (18 C.F.R. § 4.38) require that applicants consult with appropriate resource agencies, tribes, and other entities before filing an application for a license. This consultation is the first step in complying with the Fish and Wildlife Coordination Act, ESA, NHPA, and other federal statutes. Pre-filing consultation must be complete and documented according to the Commission's regulations.

1.4.1 Scoping

Before preparing this EA, staff conducted scoping to determine what issues and alternatives should be addressed. A scoping document was distributed to interested agencies and others on September 3, 2015. The scoping document was noticed in the *Federal Register* on September 25, 2015. Two scoping meetings were held on October 6, 2015, in Ogden, Utah, to obtain comments on the project. A court reporter recorded all comments and statements made at the scoping meetings, and these are part of the

Commission's public record for the project. In addition to the comments provided at the scoping meetings, the following entities filed written comments:

Commenting Entities	Date Filed
U.S. Bureau of Reclamation	October 20, 2015
U.S. National Park Service	November 6, 2015
U.S. Department of Interior, Fish and Wildlife Service	November 19, 2015

1.4.2 Interventions

On October 16, 2018, the Commission issued a notice accepting the application to relicense the Weber Project. The notice, which was published in the *Federal Register* on October 23, 2018, set December 17, 2018, as the deadline for filing protests and motions to intervene. In response to the notice, the entities listed below filed for intervenor status. None of the interventions filed are in opposition to the proposed project.

Intervenor	Date Filed
Utah Department of Natural Resources (Utah DNR)	December 12, 2018
American Whitewater	December 13, 2018
Trout Unlimited	December 13, 2018
U.S. Forest Service	December 17, 2018

1.4.3 Comments on the Application

The October 16, 2018, notice also solicited comments, recommendations, prescriptions, and final terms and conditions. The following entities commented:

Commenting Entities	Date Filed
American Whitewater	December 13, 2018
Trout Unlimited	December 13, 2018
U.S. Forest Service	December 17, 2018

PacifiCorp filed reply comments on January 29, 2018.

2.0 PROPOSED ACTION AND ALTERNATIVES

2.1 NO-ACTION ALTERNATIVE

Under the no-action alternative, the project would continue to operate under the terms and conditions of the existing license, and no new environmental protection, mitigation, or enhancement measures would be implemented. We use this alternative to establish the baseline environmental conditions for comparison with other alternatives.

2.1.1 Existing Project Facilities

The Weber Project consists of the following existing facilities: (1) a 114-foot-long, 27-foot-high concrete diversion dam with a spillway crest elevation of 4,789.18 feet (NAVD-88) that consists of: (a) two 29-foot-long by 8.7-foot-high radial gates, (b) one low-level outlet gate, (c) a 3-foot-wide by 18-foot-long non-operative fish passage structure that is used to pass minimum flows and ice through a calibrated slide gate opening, hereafter referred to as the "ice chute", and (d) a 35-foot-wide intake structure located at the left abutment that contains a 22-foot-wide by 31-foot-long by 19-foot-tall concrete intake box; (2) an 8.4-acre forebay with a gross storage capacity of approximately 42 acre-feet; (3) a 9,110-foot-long, 66-inch to 76-inch-diameter steel penstock partially encased in concrete; (4) a powerhouse containing one 3,850 kilowatt (kW) generating unit; (5) a reinforced concrete tailrace located underneath the powerhouse floor with water discharged over a weir on the south side of the powerhouse directly into the Weber River approximately 1.7 miles downstream of the diversion dam; (6) a 77-foot-long, 46-kilovolt (kV) transmission line which connects to the Weber substation (substation is not part of the Weber project); (7) a small recreation site located on Forest Service land north of the project diversion dam along portions of the forebay and bypassed reach that includes a paved access road, paved parking lot, asphalt path, fishing platform, picnic table, open grass area, former sandbox play area, interpretive display, seasonal portable toilet, dumpster, and barbeque grills; and (8) appurtenant facilities.

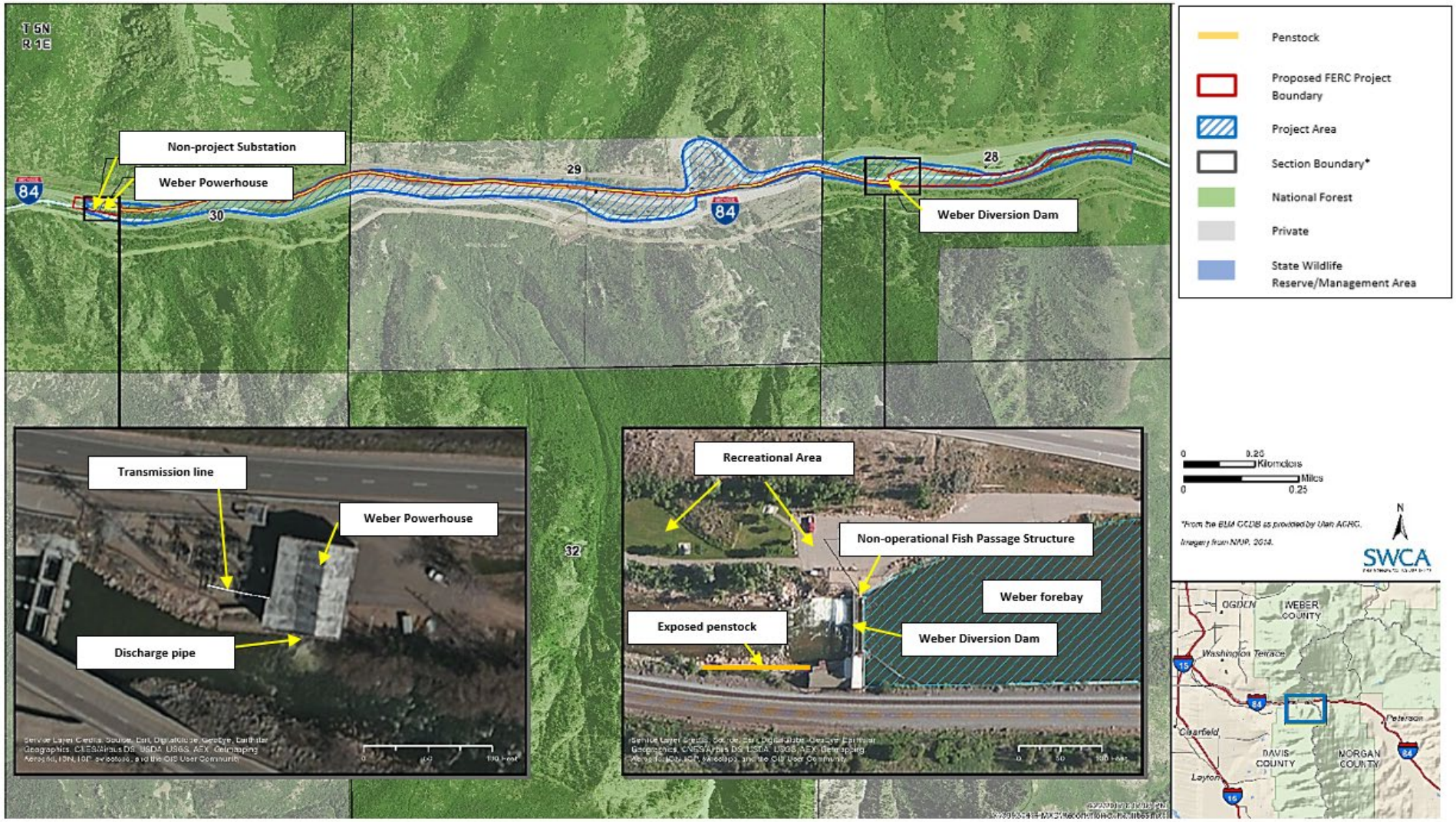

Figure 2. Project Facilities for the Weber Hydroelectric Project P-1744. (Source: PacifiCorp 2018a, as modified by staff).

2.1.2 Project Safety

The Weber Project has been operating since June 1990 under its existing license and during this time, Commission staff has conducted operational inspections focusing on the continued safety of the structures, identification of unauthorized modifications, efficiency, and safety of operations, compliance with the terms of the license, and proper maintenance.

As part of the relicensing process, Commission staff would evaluate the continued adequacy of the proposed project facilities under a new license. Special articles would be included in any license issued, as appropriate. Commission staff will continue to inspect the project during the term of any new license to assure continued adherence to Commission-approved plans and specifications, special license articles relating to construction (if any), operation and maintenance, and accepted engineering practices and procedures.

2.1.3 Current Project Operation

The project is operated in a run-of-river mode. Although the current license does not require any restrictions on the forebay operating level, for all but the winter months the project is typically operated to maintain the forebay elevation 3 to 4 inches below the normal pond elevation of 4,797.9 feet. The normal pond elevation coincides with the top elevation of the spillway gates.

In accordance with Article 401 of its current license, PacifiCorp maintains a continuous minimum stream flow in the 1.7-mile-long bypassed reach of 34 cubic feet per second (cfs) or inflow, whichever is less, from October 1 to March 31, and 34-50 cfs (flow dependent on the annual runoff forecast), or inflow, whichever is less, from April 1 to September 30. Minimum flows are passed via the ice chute located on the north side of the spillway, which is calibrated annually.

The minimum hydraulic capacity of the generating unit is 1 cfs, and the normal full load steady state hydraulic capacity of it is 320 cfs.[3] When inflows to the project are greater than the normal steady state hydraulic capacity plus minimum flow requirement, the forebay level increases until it overtops the radial gates. The north spillway gate opens via automated controls when inflows cause the forebay to rise 3 to 4 inches above the normal pond elevation and closes when the forebay level recedes to the normal pond elevation. Under high flow conditions when the forebay level continues to rise after opening the north spillway gate, an alarm is tripped when the forebay rises more than 6

[3] The maximum hydraulic capacity of the generating unit is 365 cfs.

inches above normal pond elevation, at which time operators are dispatched to manually raise the south spillway gate.

During low flow conditions, when inflows are less than the minimum hydraulic capacity plus minimum flow requirement, flows diverted for generation are continually reduced until the unit shuts down, at which point all flows are passed into the bypassed reach at the dam via the ice chute. Storage at the U.S. Bureau of Reclamation's upstream Echo Reservoir typically reduces inflows during the fall and winter months, except during very wet years. During the winter months, the project's forebay level controls are set to maintain a low water set point up to 12 inches below the normal pond elevation. In the event insufficient water is expected for generation on a long-term basis (sometimes from mid-October – February or March), the forebay is drawn down and emptied by raising the spillway gates and opening the low-level outlet gate. When the forebay is emptied, the river channel carries water directly to the low-level outlet at the dam.

2.1.4 Current Environmental Measures

In addition to providing the minimum instream flows in the project bypassed reach noted above (Article 401), PacifiCorp continues to implement a Cultural Resource Management Plan (Article 403) to protect cultural resources in the project area and maintain a recreation site (Weber Recreation Site) located, north of the project diversion dam and along portions of the forebay and bypassed reach immediately above and below the dam, respectively (Article 405).

2.2 APPLICANT'S PROPOSAL

2.2.1 Proposed Project Facilities

PacifiCorp proposes the following new project facilities and modifications to existing facilities:

- Construct a fish ladder at the project diversion dam suitable for upstream passage of both Bonneville cutthroat trout (BCT) and bluehead sucker, including a fish trap that would be operated by Utah Division of Wildlife Resources (Utah DWR) and Trout Unlimited.
- At the project recreation site: (1) install a year-round permanent vault toilet facility, and create a new, or modify an existing, picnic site to be accessible to persons with disabilities; (2) repave the access road and the asphalt path; (3) remove the south, east, and west portions of fencing around the former sandbox play area; and (4) construct steps on an existing, user-created dirt trail that provides river access.

2.2.2 Proposed Project Boundary

The current boundary encloses a total of 18.48 acres, which includes 15.51 acres of National Forest System (NFS) land. PacifiCorp proposes the following modifications to the existing project boundary, which would result in it enclosing a total of 18.08 acres, including 14.94 acres of NFS land:

- Add the area from the diversion dam to approximately 520 feet downstream of the diversion dam, incorporating the river and riparian areas that are situated between the recreation site, on the north bank of the river, and the penstock, on the south bank of the river, to provide additional area needed for project operations and maintenance.
- Add portions of the I-84 freeway access roads (east of the powerhouse area, and west of the powerhouse area) that provide direct access to the powerhouse and surrounding project facilities and are currently used during project operations.
- Add the area between the powerhouse access road and the Weber River shoreline, to the south, and the area between the powerhouse access road and edge of the I-84 freeway right-of-way, to the north, to encompass access roads, buildings, and maintenance areas required for project purposes.
- Add and remove areas along the upstream (eastern) extent of the Weber forebay, to the river-to-forebay transition area, to more accurately align the project boundary with the forebay shoreline.
- Remove the area along the northern edge of the recreation site and access road to improve alignment with existing project facilities and avoid encroachment on the I-84 freeway rest area.
- Remove the area immediately east of the intersection of the project access road and the I-84 freeway rest area access road to avoid encroachment on the I-84 freeway rest area.
- Remove the area downstream (west) of the powerhouse and transmission line that includes the non-project substation, Weber River and shoreline, and the Davis and Weber Counties Canal Company (DWCCC) diversion dam.

2.2.3 Proposed Project Operation

PacifiCorp included in its final license application a signed Memorandum of Agreement (MOA) (Appendix A) between PacifiCorp, Utah DWR, the U.S. Department of Interior, U.S. Fish and Wildlife Service (FWS), the Forest Service, the U.S. Bureau of Reclamation (BOR), American Whitewater, the DWCCC, Trout Unlimited, the Weber Basin Water Conservancy District, and the Weber River Water Users Association. In the

MOA, the parties agree to a list of protection, mitigation and enhancement (PM&E) measures for the Weber Project. Some of these measures relate to project operations and are described below.

PacifiCorp proposes to continue to operate the project in a run-of-the-river mode, maintaining the existing minimum flow regime in the project bypassed reach. The first 20 cfs of required minimum flows would be released through the proposed fish ladder and additional flow needed to meet the minimum flow requirement would be released through the existing ice chute. To ensure that the flow through the ice chute would provide the necessary attraction flow for fish passage, when needed, the south radial gate would be opened rather than the north radial gate. In the event that the proposed fish ladder is not able to function due to the low forebay elevations, PacifiCorp proposes to release flows through the low-level gate to facilitate fish passage.

PacifiCorp proposes to curtail generation (up to 320 cfs or inflow) to provide boating flow releases to the bypassed reach annually for 4-hour segments on any four Saturdays prior to July 15. The proposed measure would only take effect if: (1) American Whitewater could identify boating access points to the bypassed reach which it believes to be safe and legal;[4] (2) the Forest Service and the DWCCC agree to review American Whitewater's proposal and the items and improvements required for safe use of the access points including, but not limited to, informational and safety-related signage, steps for the access area, and hazard mitigation; and (3) the Forest Service agrees, in its sole discretion, that the proposed access points would be appropriate for public use. If reaching an agreement among the parties on these steps to establish suitable boating access points would result in an implementation delay of boating flow releases, PacifiCorp proposes to "make up" lost releases at a rate of two per year, for a total of up to 10 years (i.e. up to 20 make-up flows, if needed). The flow schedule, and public notices of the schedule, would be determined in conjunction with American Whitewater, and coordinated with the Forest Service and DWCCC. Changes to the boating flow release schedule would be made based on the level of boater participation in each release event the previous year.

2.2.4 Proposed Environmental Measures

PacifiCorp proposes the following environmental measures, as detailed in the MOA:

[4] On January 7, 2020, American Whitewater filed to the Weber project record its Weber River Safety and Access Proposal, which it had previously submitted directly to the Forest Service for review (accession no. 20200107-5024).

Water Resources

- Continue to provide a minimum flow to the bypassed reach of 34 cfs or inflow, whichever is less, from October 1 to March 31, and 34-50 cfs (flow determined annually based on the Weber River runoff forecast from Natural Resources Conservation Service (NRCS)), or inflow, whichever is less, from April 1 to September 30 (HYD-1 and FISH-1).

Fisheries and Aquatic Resources

- Construct, operate, and maintain a fish ladder suitable for upstream passage of both Bonneville cutthroat trout (BCT) and bluehead sucker, including a fish trap (FISH-2).[5]
- Develop a fish passage consultation and communication plan (Communication Plan) that includes provisions for annual consultation with certain MOA parties with fishery-related interests regarding the operation of the fish ladder and trap (FISH-2).
- Maintain a full forebay during prolonged project outages, as operational constraints and winter icing conditions allow, to ensure fish ladder operation and effective upstream fish passage (FISH-4); operate the low-level gate when the forebay is dewatered and the fish ladder is inoperable during winter low-flow conditions or during project maintenance to provide upstream fish passage (FISH-3); re-open the low-level gate as soon as possible in an effort to restore upstream fish passage when the fish ladder and the low-level gate are inoperable for more than 10 days, and consult with certain MOA parties with fishery-related interests using the protocols defined in the proposed Communication Plan to discuss interim fish passage options (FISH 3 and 4).

Terrestrial Resources

- Continue annual consultation with the Forest Service to discuss any planned project operation and maintenance activities that could affect botanical and wildlife resources to determine if additional protective measures are necessary (BOT-1 and WL-1).
- Implement measures to minimize the introduction and spread of non-native, invasive weed species and revegetate areas where any ground-disturbance

[5] PacifiCorp states that the fish trap would be operated by third parties (i.e., Utah DWR and Trout Unlimited). However, while a licensee may hire a third party to operate its licensed facilities, the licensee is ultimately responsible for its operation.

would occur as a result of proposed trail improvements, fish ladder construction, and other project-related activities, as needed (BOT-2).

Recreation Resources

- Continue to maintain the existing project recreation site, but with modifications outlined below in REC-2 through REC-8 (REC-1).
- Install signage at the recreation site instructing visitors on dog waste protocol and provide dog waste bags for disposal (REC-2).
- Create a webpage that provides real-time, approximate bypassed reach flow information, and include a scannable code, that links to the flow information webpage, on improved interpretive signage at the project recreation site (REC-3).
- Install and maintain a year-round permanent vault toilet facility at the project recreation site that is accessible to persons with disabilities (REC-4).
- Construct a new picnic site on the open grass area closest to parking lot (consisting of a concrete pad, a grill, and a picnic table), or modify an existing site per Forest Service standards, that is accessible to persons with disabilities (REC-5).
- Repave the access road and asphalt path at the project recreation site (REC-6).
- Remove fencing along the south, east, and west portions of the former sandbox play area (retain north portion to partition recreation site from I-84 freeway) (REC-7).
- Improve the existing user-created river access trail at the west end of a recreation site inside the Weber Project boundary (REC-8).[6]
- Annually provide whitewater boating flow releases to the bypassed reach, by curtailing generation (up to 320 cfs, or inflow), for 4-hour periods on four Saturdays prior to July 15, and construct a take-out/portage which would include steps, signage, and hazard mitigation, if: (1) American Whitewater can identify a safe and legal location for the take-out/portage; (2) Forest Service

[6] On a related matter, the MOA also stipulates that PacifiCorp provide $30,000 through an off-license agreement with Trout Unlimited to fund a cooperative effort to improve pedestrian river access (with concurrence from Utah Department of Transportation and the underlying land owner) outside of the project boundary at the non-project, user-created informal river access trail extending west from the project recreation site. Proposed improvements would involve breaking up the existing large-boulder surface or backfilling this surface to create a navigable path of smaller rock with minimal width (no paving). PacifiCorp is not proposing the funding provision as a licensing action.

and DWCCC agree to review the proposed location and PacifiCorp's proposed facilities for the location; and (3) Forest Service agrees that the proposed location is appropriate for public access and use (REC-9).

Cultural Resources

- Implement the HPMP that was filed on May 18, 2018 (CULT-1).

2.2.5 Modifications to Applicant's Proposal–Mandatory Conditions

The following mandatory conditions were provided and are evaluated as part of the PacifiCorp's proposal.

Section 4(e) Land Management Conditions

The Forest Service filed final terms and conditions under section 4(e) of the FPA, which we include in Appendix B. We consider conditions 1 through 10, 12, parts of 13, and 14 through 16 to be administrative; therefore, they are not analyzed in this EA. The remaining resource-specific conditions are analyzed in this EA and summarized below.

- Condition 11: Implement the Hazardous Substances Plan for locations on NFS lands.

- Condition 13: Conduct annual consultation to discuss: (1) new sensitive species, and federally listed and delisted species under ESA; (2) newly discovered cultural resource sites; (3) employee site-awareness training; (4) development of a fish passage consultation and communication plan with provisions for PacifiCorp to consult with resource agencies and other interested parties on the operation of the fish ladder and any fishway issues; (5) recreation resources coordination with certain MOA parties with recreation-related interests on the implementation of PacifiCorp's proposed REC-2, REC-5, REC-8, and REC-9 measures.

- Condition 17: Develop best management practices (BMPs) for project operation and maintenance (O&M) activities that have the potential to introduce or spread aquatic and terrestrial invasive species in the project area.

- Condition 18: Consult on any issues relating to special-status species and sensitive areas.

- Condition 19: Develop erosion and sediment control BMPs for project O&M activities.

- Condition 20: Develop a fire prevention and response plan that includes: (1) fire hazard reduction measures; (2) identification of fire danger and public safety measures associated with project-induced recreation; (3) an analysis of fire prevention needs, including equipment and personnel availability; (4) locations of available fire suppression equipment and personnel; and (5) reporting requirements.

- Condition 21: Implement the MOA (Exhibit E, Appendix A of PacifiCorp's Final License Application) filed with the Commission on May 30, 2018.

Section 401 Water Quality Certification Conditions

Utah DEQ issued a WQC pursuant to section 401 of the CWA with 15 conditions, which we include in Appendix C). We consider conditions 9, 10, and 12-15 to be administrative; therefore, they are not analyzed in this EA. The remaining resource-specific conditions are analyzed in this EA and summarized below.

- Condition 1: Construct and operate a fish ladder suitable for upstream passage of both Bonneville cutthroat trout and the bluehead sucker, the design of which must include a fish trap.

- Condition 2: Do not conduct work on the fish ladder from February to June to allow for the movement and spawning of the Bonneville cutthroat trout and the bluehead sucker.

- Condition 3: Coordinate with project stakeholders during and after construction of the fish ladder for work related to, but not limited to, channel dewatering, fish salvage, and fish trap operation and maintenance.

- Condition 4: Continue to maintain a minimum stream flow in the bypassed reach of 34 cfs or inflow, whichever is less, from October 1 to March 31 annually, and a continuous minimum flow of 34-50 cubic feet per second (cfs) (dependent on annual runoff forecast) or inflow, whichever is less, from April to September 30.

- Condition 5: Once the fish ladder is operational, provide approximately 20 cfs of the required minimum flow via the fish ladder and use the rest (approximately 14-30 cfs) as attraction flow.

- Condition 6: Construct the fish ladder during a period of low flow, use best management practices to limit sediment discharges into stream flows during construction, and divert flows away from the construction area using a non-erodible cofferdam or other means of bypass.

- Condition 7: Prior to constructing the fish ladder: (1) identify an area within the project boundary to store the excavated material, which is located at least 50 feet from the Weber River and protected using proper BMPs to prevent discharges into state waters, or (2) develop a plan to transport the excavated material offsite for storage in an upland location or disposal.

- Condition 8: Develop a refueling plan prior to refueling of equipment over porous ground within 500 feet from the edge of the nearest waterbody (including wetlands), 200 feet from the nearest private water supply well, or 100 feet from the nearest municipal water supply well.

- Condition 11: Do not use any fill material that may leach organic chemicals (e.g., discarded asphalt), noxious weeds/seeds or nutrients (e.g., phosphate rock) into state waters.

2.3 STAFF ALTERNATIVE

Under the staff alternative, the project would include most of PacifiCorp's proposed licensing measures and the following modifications and additional measures:

Aquatic Resources

- Develop an operation compliance monitoring plan for monitoring compliance with the operating requirements of any new license issued for the project (e.g., run-of-river, minimum flows, impoundment levels, and regulating flow through the dam to enhance upstream and downstream fish passage).

- Develop an upstream fish passage plan for the proposed fish ladder that includes: (1) detailed, final design drawings of the proposed fish ladder; (2) a construction schedule and description of construction methods and procedures; (3) a detailed description of fish ladder operation and maintenance methods and procedures; and (4) a description of methods to conduct a one-year effectiveness evaluation of the new fish ladder to ensure that the fish ladder is generally operating as designed, and if not, make minor adjustments to the facility and operation.

Recreation Resources

- Develop a recreation plan that includes: (1) operation and management procedures for the project recreation site; (2) conceptual drawings and descriptions of the proposed and recommended project recreation improvements which include: (a) installation of a permanent vault toilet that is

accessible to persons with disabilities; (b) construction of a new picnic site (or modification of the existing site) in consultation with the Forest Service, that is accessible to persons with disabilities; (c) maintenance and repaving of the recreation site access road and asphalt path; (d) reconfiguration of the former sandbox play area fencing; (e) construction of steps for improving access to the existing dirt river access trail at the west end of the recreation site; (f) improvements to the user-created informal river access trail; and (g) improved interpretive signage that includes dog waste protocols and river flow information; (3) a schedule for maintaining the year-round permanent vault toilet, the paved access road and asphalt path, the new (or modified) picnic site and other picnic sites, the fishing platform, the interpretive signage, the former sandbox play area fencing, the existing dirt river access trail at the west end of the recreation site, and the user-created informal river access trail that extends west beyond the recreation site; (4) revised Exhibit G drawings identifying all of the above as project recreational facilities; and (5) information regarding the creation and maintenance of a publicly-accessible webpage, hosted and maintained by PacifiCorp, for indicating approximate flows in the bypassed reach.

- Develop a release plan for the proposed whitewater boating flows that details protocols for releasing proposed whitewater flows according to the outcomes of consultation activities with interested parties and agencies and the results of evaluations of each previous year's scheduled releases.

- Modify the project boundary to incorporate the user-created informal river access trail extending west from the project recreation site to no further than the Utah DOT right-of-way of the eastbound lanes of I-84 freeway overpass as a project facility and implement improvements to the trail to create a navigable path with minimal width.

2.4 STAFF ALTERNATIVE WITH MANDATORY CONDITIONS

We recognize that the Commission is required to include valid section 4(e) conditions and Utah DEQ 401 WQC conditions in any license issued for the project. Thus, the staff alternative with mandatory conditions includes staff-recommended measures along with the following mandatory conditions that we did not include in the staff alternative: (1) organize and convene an annual consultation meeting with resources agencies and other interested parties on fish ladder passage, operations for passage, and fishway issues and outages (4(e) condition 13), (2) include Trout Unlimited as a consulted entity in coordinating recreation resource measures and developing a fish passage consultation and communication plan (4(e) conditions 13); and (3) implement the MOA's provision to provide $30,000 through an off-license agreement with Trout

Unlimited to fund a cooperative effort to improve pedestrian river access (4(e) condition 21).

2.5 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

We considered several alternatives to the applicant's proposal but eliminated them from further analysis because they are not reasonable in the circumstances of this case. They are: (1) federal government takeover of the project, (2) issuing a non-power license, and (3) decommissioning (retiring) the project.

2.5.1 Federal Government Takeover of the Project

We don't consider federal takeover of the project to be a reasonable alternative. Federal takeover of the project would require Congressional approval. While that fact alone would not preclude detailed consideration of this alternative, there is currently no evidence showing that federal takeover should be recommended to Congress. No party has suggested that federal takeover would be appropriate, and no federal agency has expressed an interest in operating the project.

2.5.2 Issuing a Non-power License

A non-power license is a temporary license that the Commission would terminate when it determines that another governmental agency will assume regulatory authority and supervision over the lands and facilities covered by the non-power license. At this point, no agency has suggested a willingness or ability to do so. No party has sought a non-power license, and we have no basis for concluding that the project should no longer be used to produce power. Thus, we do not consider issuing a non-power license a realistic alternative to relicensing in this circumstance.

2.5.3 Retiring the Project

Project retirement could be accomplished with or without dam removal. Either alternative would involve denial of the relicense application and surrender or termination of the existing license with appropriate conditions. In a comment filed on January 18, 2017, a single public individual suggested project retirement because they do not believe the benefits from the amount of energy that the project produces are greater than the benefits of the river being returned to its free-flowing and natural state. No other party participating in the relicensing process has suggested dam removal would be appropriate in this case, and we have no basis for recommending it. The project dam and forebay serves an important purpose as it provides a recreational fishing opportunity within the forebay at which the project recreation site's fishing platform is situated, regardless of whether power is produced. Thus, dam removal is not a reasonable alternative to

relicensing the project with appropriate protection, mitigation, and enhancement measures.

The second project retirement alternative would involve retaining the dam and disabling or removing equipment used to generate power. Project works would remain in place and could be used for historic or other purposes. This would require us to identify another government agency with authority to assume regulatory control and supervision of the remaining facilities. No such agency has stepped forward, and we have no basis for recommending it. Because the power supplied by the project is needed, a source of replacement power would have to be identified. In these circumstances, we do not consider removal of the electric generating equipment to be a reasonable alternative.

3.0 ENVIRONMENTAL ANALYSIS

In this section, we present: (1) a general description of the project vicinity; (2) an explanation of the scope of our cumulative effects analysis; and (3) our analysis of the proposed action and other recommended environmental measures. Sections are organized by resource area (aquatic, recreation, etc.). Under each resource area, historic and current conditions are first described. The existing condition is the baseline against which the environmental effects of the proposed action and alternatives are compared, including an assessment of the effects of proposed mitigation, protection, and enhancement measures, and any potential cumulative effects of the proposed action and alternatives. Staff conclusions and recommended measures are discussed in section 5.1, *Comprehensive Development and Recommended Alternative* of the EA.[7]

3.1 GENERAL DESCRIPTION OF THE RIVER BASIN

The Weber River Basin drains an area of 2,476 square miles in Summit, Morgan, Weber, and Davis Counties, Utah, and part of Uinta County, Wyoming. The primary drainage of the basin, the Weber River, forms near Reids Peak (11,708 feet) in the Uinta Mountains, flows west to Oakley, Utah, and then flows in a northwesterly direction to its terminus at Great Salt Lake. The Weber River is approximately 125 miles long, and within its drainage there are approximately 968 miles of perennial streams and 1,254 miles of intermittent streams (Great Salt Lake Information System 2017). Flows in the Weber River Basin are regulated by seven major reservoirs. Echo and Rockport Reservoirs are located on the mainstem of the Weber River, whereas Pineview, Causey, East Canyon, Lost Creek, and Smith and Morehouse Reservoirs are located on tributaries.

Mean annual precipitation for the basin is 26 inches (3.4 million acre-feet). It is estimated that approximately 70 percent of the total precipitation in the watershed on average is consumed by vegetation and humans, leaving approximately 9 inches (1.2 million acre-feet) that is yielded to the basin's rivers, streams, and aquifers. Of the annual water yield, approximately 3 percent is exported out of the basin through canals (Great Salt Lake Information System 2017).

In the vicinity of the project, Weber Canyon is a narrow, steep-walled canyon with highly altered (filled and channelized) riverine and canyon floor environments. The high degree of alteration is due primarily to the construction of the I-84 freeway and its associated bridges and infrastructure, as well as various pipelines, cable and fiber utility

[7] Unless otherwise indicated, our information is taken from the license application filed by PacifiCorp on May 30, 2018 (PacifiCorp, 2018a), the responses to deficiencies and requests for additional information PacifiCorp filed on September 13, 2018 (PacifiCorp, 2018b), and the Final Recreation Technical Report (Cirrus, 2017) and the Whitewater Recreation Study Technical Report (ERM-West, 2016) filed by PacifiCorp on June 30, 2017.

lines, the Union Pacific Railroad Company (UPRC) railroad track corridor, the former highway, the project diversion dam and penstock, and other river diversion structures. Some areas of fill, up to 30 feet deep and placed primarily to facilitate freeway construction, altered the original hydrogeomorphology of the canyon beginning in the 1960s.

3.2 SCOPE OF CUMULATIVE EFFECTS ANALYSIS

According to the Council on Environmental Quality's regulations for implementing the National Environmental Policy Act (40 C.F.R. § 1508.7), a cumulative effect is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time, including hydropower and other land and water development activities.

Based on our review of the license application, as well as agency and public comments, the proposed action in this license application, we identified water quality, fisheries resources, terrestrial resources, and recreation a having the potential to be cumulatively affected by the proposed action in combination with past, present, and reasonably foreseeable future actions.

Water quality and fisheries resources were identified because over time, numerous small irrigation diversion dams and two other hydroelectric projects on the Weber River and its tributaries have converted riverine habitats to lake-type habitats, which, relative to the prior riverine habitats, absorb more solar radiation and have higher summer water temperatures. These reservoirs and shallow impoundments have provided environmental conditions conducive to non-native macrophyte growth, which in turn may have been responsible for occasionally elevated levels of nutrients and decreased levels of dissolved oxygen relative to the former riverine conditions. The dams and diversions associated with numerous irrigation projects have also substantively increased the number of barriers to fish movements in the basin. Potential load following operations on the Weber River upstream of the project at Echo Dam may be causing disruption of fish spawning in shallower reservoir areas and river habitats.

Terrestrial resources were identified because recreation, infrastructure development (e.g., roads, railroads), land clearing (e.g., timber harvest), and associated disturbances/activities (e.g., noise, vehicular traffic) have affected habitat and wildlife and plant species through land clearing/alteration, introduction and spread of invasive weed species, wildlife displacement, and alteration of wildlife movements. In addition, regulated upstream flows have altered surface water fluctuations potentially contributing to shoreline erosion that may affect riparian habitats.

Recreation, specifically river-based recreation, was identified because river-based recreation opportunities in the Weber River Basin are affected by water diversion and water storage projects, including the Weber project, which influence the hydrologic flow regime of the Weber River and affect the availability of whitewater boating flows. Additionally, the built environment, including the I-84 freeway, UPRC railroad track corridor, and project powerhouse area (all which prohibit public/unauthorized access within the respective properties) influences accessibility to the Weber River for river-based recreation use, as these facilities are situated immediately adjacent to the river and its river banks.

3.2.1 Geographic Scope

The geographic scope of analysis for cumulatively affected resources is defined by the physical limits or boundaries of: (1) the proposed action's direct and indirect effects on the resources, and (2) contributing effects from other hydropower and non-hydropower activities within the geographic scope of analyses. Because the proposed action would affect resources differently, the geographic scope of analysis for each resource may vary.

The Weber River Basin from the upstream portion of the project boundary downstream to the confluence with the Ogden River is the geographic scope of analysis for water quality. This area was chosen because the project's cumulative effects on water quality is limited to this area (i.e., the project would not result in measurable direct or indirect effects to water quality upstream or downstream of this area).

For fisheries resources, the Weber River Basin downstream of the Bureau of Reclamations' Echo Dam[8] has been identified as the geographic scope of analysis. This area was chosen because the Weber Project, in combination with other dams, hydroelectric projects, and irrigation diversions located upstream and downstream on the Weber River and its tributaries, influence fish migration and affect habitat availability and accessibility within this 43-mile-reach of the Weber River from Echo Dam downstream to the confluence with the Ogden River.

The geographic scope of analysis for terrestrial resources encompasses the Weber River Basin. This geographic scope of analysis was chosen because regulation of flows by upstream dams and diversions, including the project, has caused daily and seasonal changes in surface water fluctuations that may have led to shoreline erosion, spread of invasive species, and alteration of shoreline habitats.

[8] Echo Dam is a complete barrier to upstream fish migration.

The geographic scope of analysis for recreation resources encompasses the Weber River Basin. This spatial scope of analysis was chosen because river-based recreation resources are available across the basin, and recreation amenities and uses provided by the project fall within this spatial scale.

3.2.2 Temporal Scope

The temporal scope of analysis includes a discussion of the past, present, and reasonably foreseeable future actions and their effects on water and aquatic resources, terrestrial resources, recreation resources, and cultural resources. Based on the potential term of a license, the temporal scope looked 30 to 50 years into the future, concentrating on the effect on the resources from reasonably foreseeable future actions. The historical discussion is limited, by necessity, to the amount of available information for each resource. We identified the present resource conditions based on the license application, agency comments, and comprehensive plans.

3.3 PROPOSED ACTION AND ACTION ALTERNATIVES

In this section, we discuss the effects of the project alternatives on environmental resources. For each resource, we first describe the affected environment, which is the existing condition and baseline against which we measure effects. We then discuss and analyze the specific cumulative and site-specific environmental issues.

Only the resources that would be affected, or about which comments were received, are addressed in detail in this EA. Based on this, we determined that geological and soil resources, water resources, fisheries and aquatic resources, botanical resources, terrestrial wildlife resources, threatened and endangered species, recreation resources, land use and aesthetics, and cultural resources may be affected by the proposed action and action alternatives. We did not identify any substantive issues related to socioeconomics; therefore, it is not assessed in the EA. We present our recommendations in Section 5.1, *Comprehensive Development and Recommended Alternative* section.

3.3.1 Geology and Soils

3.3.1.1 Affected Environment

Geology

The main geologic unit identified in the project area is the Farmington Canyon Complex (Lowe et al. 2003). The Farmington Canyon Complex, which formed the Wasatch Range, consists of early Proterozoic high-grade metamorphic and igneous rocks (Bryant 1984, as cited in Lowe et al. 2003). Most of the project area is underlain by Precambrian metamorphic rocks such as migmatite and gneiss. The eastern end of the

project area is underlain by surficial alluvium and colluvium deposits, which primarily consist of silts, sands, and pebbles and gravel. There are two major northwest-southeast-trending fault lines through the central portion of the project area, and an additional two fault lines just east of the project area. In addition, the Utah Geological Survey indicates that the portion of Weber Canyon containing the project area is susceptible to shallow and/or deep-seated landslides largely due to slopes greater than 30 percent (Christenson and Shaw 2008a). For the same reason (slopes greater than 30 percent) Utah Geological Survey also identifies the portion of Weber Canyon containing the project area as a debris flow source area (Christenson and Shaw 2008b).

Soils

There are two reported soil types for the project area, both of which are primarily rocky outcrop-type soils (Rock outcrop-Patio-Nagisty-Broad Canyon and Rock outcrop-Ridd-Barton). The primary difference between these two soil types is that the soil complex (Rock outcrop-Ridd-Barton) encompassing the western part of the project area has a slightly higher percentage of clay, sand, and organic content by mass, and has a greater soil k-factor (i.e., is slightly more erodible) than the soil complex (Rock outcrop-Patio-Nagisty-Broad Canyon) encompassing the eastern part of the project area. Most of the soils in the Project Area and surrounding landscape are recent surficial deposits that were formed by lakebed deposits, river deposits, mountainside erosion, and glacial processes (Lowe et al. 2003). Due to the low resolution of STATSGO soil survey data (versus Soil Survey Geographic Database [SSURGO] survey data), other soil properties are too variable or vague to be generalized for the project area.

3.3.1.2 Environmental Effects

PacifiCorp proposes several measures that have the potential to affect geology and soils in the project area, including the construction of a fish ladder, improvements to two user-created trails, and the release of boating flows. PacifiCorp proposes, and Utah DEQ specifies, implementation of BMPs to control erosion during construction activities.

Our Analysis

Construction of the proposed fish ladder would require earthmoving activities in the vicinity of the Weber diversion dams' north bank. This would result in the perturbation of approximately 0.16 acre of the surficial alluvium and colluvium deposits, (primarily silts, sands, pebbles, and gravel) underlying the project area in this location. Approximately 1,130 cubic yards of these deposits would be removed from the area and the fish ladder structure would be constructed in their place. The perturbation and removal of these deposits would not result in a substantive change in the geological structure of the area, due to the small acreage and volume being removed.

Construction activities related to the proposed fish ladder would occur in the eastern portion of the project area adjacent to the diversion dam. STATSGO data indicate that the area where the fish ladder would be constructed comprises a soil complex that is not highly erodible (Rock outcrop- Patio-Nagisty-Broad Canyon), with a large portion of the area (approximately 31 percent) currently developed surface (asphalt/concrete). Most of the remaining site area is currently un-vegetated and previously disturbed ground adjacent to the ice chute. Erosion control BMPs (e.g., silt fences, etc.), as proposed and specified by Utah DEQ, would help to reduce any soil erosion and sediment delivery to the Weber River that may occur during the proposed construction activities.

PacifiCorp proposes improvements to up to two user-created trails providing access to the Weber River. One of these trails falls within the proposed project boundary and leads south from the project recreation site to the north bank of the Weber River. The other trail leads west from the recreation site outside of the proposed project boundary and under the I-84 freeway. It is anticipated that trail improvement activities, specifically step construction, on the trail within the project boundary leading south to the north bank of the Weber River may result in a small area of localized disturbance to surface soils along the trail. Step construction is unlikely to result in a substantive amount of soil loss and soil delivery to the river because of the limited construction activities (no more than approximately 18 feet of step construction along approximately 30 linear feet of trail approximately 2-3 feet wide) and application of the proposed BMPs. The presence of the steps along this trail would ultimately reduce the potential for soil erosion and soil delivery to the river as a result of trail use in the future because the steps themselves would control erosion. No long-term soil or erosion-related impacts are expected as a result of proposed trail improvements. Constructing steps on the existing dirt river access trail at the west end of the project recreation site, within the project boundary, would minimize and mitigate soil erosion on this bare-earth trail by keeping recreation site visitors on a hardened surface while accessing the river. Trail improvement activities on the user-created informal river access trail, leading west from the project recreation site, are anticipated to be limited to breaking up, or filling in, the existing large-boulder surface to create a navigable path of smaller rock with minimal width.

PacifiCorp proposes to curtail generation and release boater flows up to 16 hours prior to July 15 annually in the event that safe legal egress can be found for boaters. Such flows would result in the release of up to approximately 320 cfs of water into the Weber River on four different occasions per year for a duration of four hours. These boater flow releases would raise the water level in the bypassed reach of the Weber River for short periods. This could result in potential stream bank scouring and subsequent erosion of soils in the bypassed reach at times when flows (although uncommon) could be as low as 34-50 cfs in the bypassed reach; however, the degree of scouring and erosion of stream banks during a boater flow release would be limited as a result of the amount of

rock armoring in the existing channel, the relatively small volume of water released for boater flows, and the relatively slow rate (1.5 feet/hour is proposed) at which water levels would rise in the bypassed reach during a flow release. Scouring and erosion of stream banks during boater flow releases is also expected to be limited because natural high flows (1,000 cfs and greater) at earlier times of the year (i.e., during spring runoff) are expected to have already eroded any erodible bank sections in the bypassed reach.

3.3.2 Aquatic Resources

3.3.2.1 Affected Environment

Water Quantity

Snowmelt in the Uinta Mountains is a major source of water that contributes to discharge of the Weber River, creating a pattern of high spring discharge followed by decreasing flows until minimum flows in late fall early winter. Flows in the Weber River entering the project reservoir are regulated by seven dams and reservoirs with a combined storage capacity of over 200,000 acre-feet. Typical water management for these upstream projects serve to store water in winter and spring and release water in summer for downstream irrigation demand. For the most recent 30-year period[9] from January 1, 1987 to December 31, 2016, the Weber River average monthly minimum flows ranged from 71 cfs in November to 542 cfs in May, while average monthly maximum flows ranged from 155 in November to 1,327 cfs in May. Average mean monthly flows ranged from 100 cfs in November to 903 cfs in May (see Table 1).

Table 1. Weber River average monthly flow data for USGS gaging station (No. 10136500) for the most recent 30-year period, 1987-2016 (Source: PacifiCorp).

Month	Minimum (cfs)	Maximum (cfs)	Mean (cfs)
January	91	269	136
February	125	333	194
March	197	748	403
April	395	1,149	671
May	542	1,327	903
June	481	1,285	829
July	333	657	444
August	298	472	368

[9] Weber River flows were estimated using data from the USGS stream flow gaging station upstream of the Project diversion dam (gage no. 10136500).

September	237	432	319
October	87	314	174
November	71	155	100
December	72	224	112

Figure 3 provides a flow duration curve (green line) for the total contribution of the Weber River over the most recent 30-year period. River flows at USGS gage No.10136500 met or exceeded 59 cfs 90 percent of the time, 275 cfs 50 percent of the time and 809 cfs 10 percent of the time.

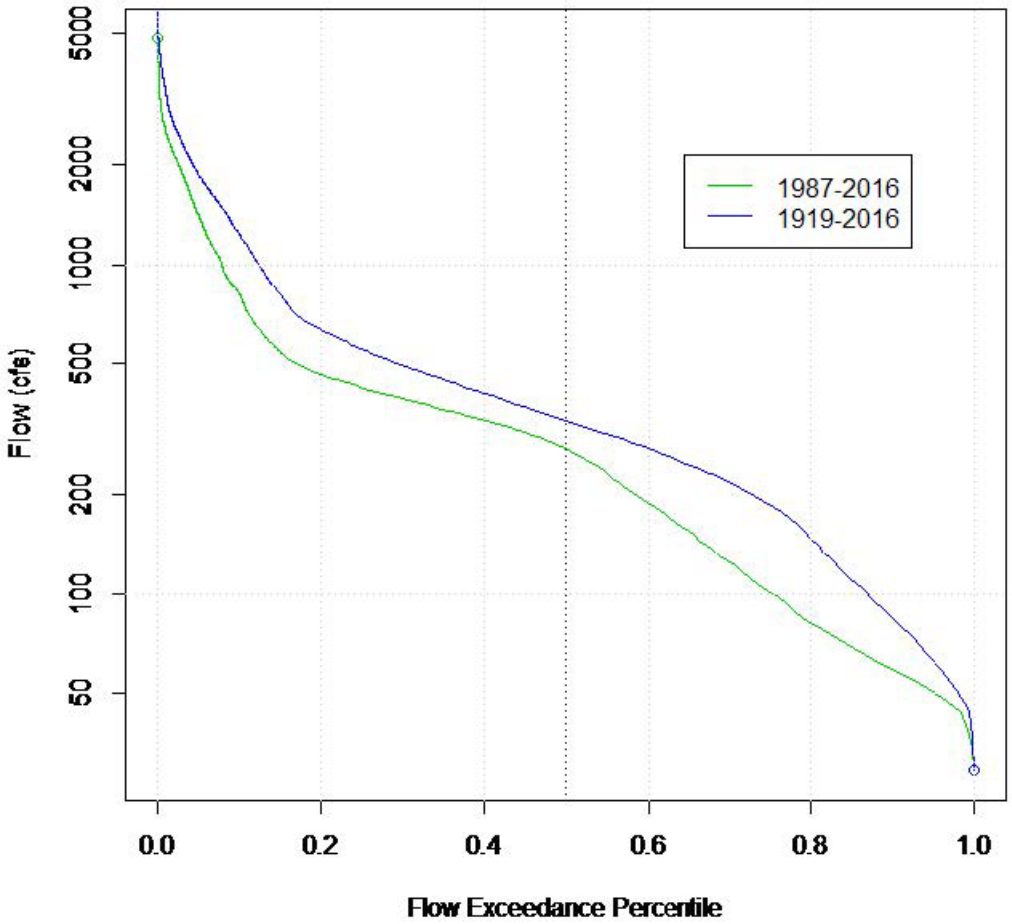

Figure 3. Flow duration curve of daily mean flows for Weber River at Gateway, UT (USGS gage no. 10136500) for the total 96-year period of record (1920-2016) and the most recent 30-year period (1987-2016). (Source: PacifiCorp 2018a).

Water Quality

The Utah DWQ delineates stream and river water quality assessment units (AUs)

based on detailed guidelines summarized in UDWQ's 2016 Final Integrated Report (Utah DWQ 2016). The Project falls within a portion of the Weber River watershed delineated as the Weber River-3 AU. This AU extends from the confluence of the Weber River with the Ogden River upstream to the confluence of Cottonwood Creek with the Weber River. It is approximately 20 miles in length and encompasses the entirety of the project area. Designated beneficial uses for this portion of the river are identified as 2B (infrequent primary contact recreation [e.g., fishing and wading]), 3A (coldwater fishery/aquatic life), and 4 (agricultural uses [crop irrigation and stock watering]). Key numeric water quality criteria applicable to these designated beneficial uses are provided in Table 2.

Table 2. Key numeric water quality criteria applicable to Weber River-3 AU (Source: PacifiCorp, 2018a).

Parameter	**2B (Infrequent Primary Contact Recreation)**	**3A (Coldwater Fishery/Aquatic Life)**	**4 (Agricultural Uses)**
pH range	6.5 – 9	6.5 – 9	6.5 – 9
Maximum Total Dissolved Solids (TDS) (mg/L)	--	--	1,200
Turbidity Increase (NTUs)	10	10	--
Biological Oxygen Demand (BOD) (mg/L)[+]	5	5	5
Nitrate as N (mg/L)[+]	4	4	--
Total Phosphorus as P (mg/L)[+]	0.05	0.05	--
Minimum Dissolved Oxygen (DO) (mg/L) - 30-day Average - 7-day Average - Minimum	 -- -- --	 6.5 9.5/5* 8/4*	 -- -- --
Temperature (°C) - Maximum - Maximum Change	 -- --	 20 2	 -- --

[+]BOD, Nitrate as N, and Total Phosphorus as P are pollution indicators only.

Water Quality Monitoring

Throughout 2016 and in early 2017 (January) PacifiCorp completed a water quality study to characterize water quality immediately upstream of the diversion dam, within the bypassed reach, and in the catch basin of the powerhouse. Water quality sampling occurred continuously at 15-min intervals for a year for most parameters measured, and monthly for total suspended solids (TSS) and chlorophyll a (grab samples) over the same period. Water quality sampling locations are described in Table 3.

Table 3. Sampling sites, methods used, and water quality parameters recorded (Source: PacifiCorp, 2018a).

Sampling Site	Data Collection Method	Water Quality Parameters
WR01 – At USGS station 10136500, Weber River, Gateway, Utah	Sonde	Temperature, pH, specific conductivity, DO, and turbidity
	Grab Sample	TSS and Chlorophyll *a*
WR02 – Upstream of the Project diversion dam	Grab Sample	Chlorophyll *a*
WR03 – Downstream of the Project diversion dam, in the bypassed reach of the river, approximately 100 meters upstream of the Project powerhouse	Sonde	Temperature, pH, specific conductivity, DO, and turbidity
	Grab Sample	TSS and Chlorophyll *a*
WR04 – Within the Project powerhouse catch basin, upstream of the DWCCC dam *	Sonde	Temperature, pH, specific conductivity, DO, and turbidity
	Grab Sample	TSS and Chlorophyll *a*

*Data were not collected at WR04 in February, November, and December 2016, and January 2017.

Temperature

Water temperature recorded at the three sampling sites follows a typical seasonal pattern (Figure 4). Temperatures recorded at WR03 (downstream of the project diversion dam, in the bypassed reach of the river, approximately 100 meters upstream of the Project powerhouse) slightly exceed the State of Utah water quality standards for temperature (20 degrees Celsius [°C]) on 15 days between July 21, 2016, and August 8, 2016.

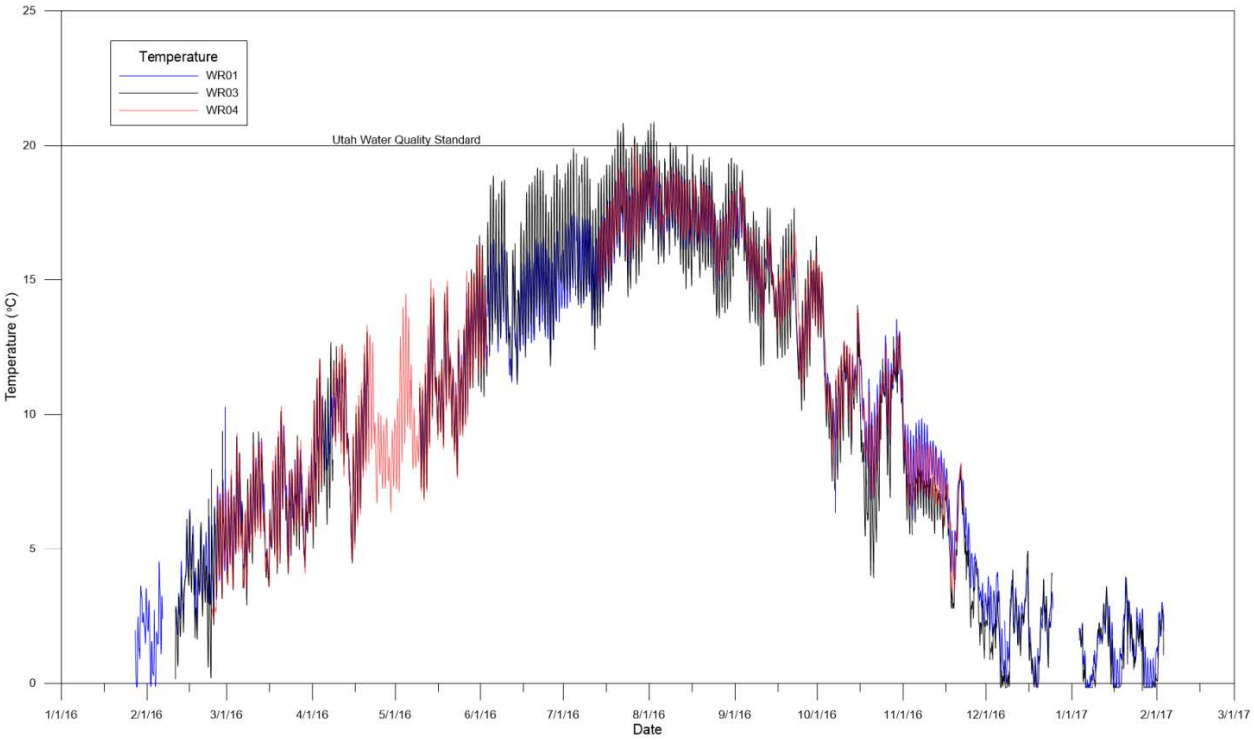

Figure 4. Weber River water temperature data (degrees Celsius) in project area. (Source: PacifiCorp 2018a).

pH

All pH data recorded at the sampling sites are within the State of Utah water quality standard of 6.5 to 9.0.

Table 4. Weber River pH data collected in the project area (Source: PacifiCorp, 2018a).

Sampling Site	Minimum	Maximum	Average
WR01	7.5	8.8	8.1
WR03	7.8	8.9	8.3
WR04	7.8	8.9	8.2

Dissolved Oxygen

DO concentrations recorded at WR04 were equal to or greater than the State of Utah water quality criteria (minimum 30-day average of 6.5 mg/L), and often above those recorded at WR01 (see Table 5). Similarly, DO concentrations recorded at WR03 were equal to or greater than the water quality criteria, except for a few instances in late September and early October when DO concentrations in the water flowing past WR01 station (upstream of the project area) were extremely low; in those instances, the DO concentrations at WR03 were greater than those measured at WR01.

DO concentrations measured at WR01 (upstream of the project area) had a wide range of fluctuations. Initially it was thought that the probe calibration may have drifted; however, the probe was calibrated periodically throughout the monitoring period, and DO concentrations continued to fluctuate. Next it was thought that temperature variations could be responsible, but that was also tested, and no correlation was observed. PacifiCorp believes that there is an unknown pollutant source upstream of WR01 that is periodically depressing DO at the sample site.

Table 5. Weber River DO data (mg/l) collected in the project area (Source: PacifiCorp, 2018a).

Sampling Site	Minimum	Maximum	Average
WR01	0.6	14.6	8.7
WR03	5.4	13.9	9.7
WR04	6.5	12.4	9.4

Turbidity

Statistical summaries for the turbidity sonde data are provided in Table 6. The three sampling sites (WR01, WR03, and WR04) follow the same general trend for turbidity (Table 6). The minimum value of 3.5 nephelometric turbidity units (NTUs) at the powerhouse (WR04) is most likely the result of there being few opportunities for deposition in the diversion pipe. Furthermore, the water turbulence caused by the turbine in the powerhouse suspends sediment. The maximum observed value was at site WR01 (74.8 NTU) which is outside the project area). The turbidity standard for a 3A cold water fishery states that the turbidity increase as a result of project implementation must be less than or equal to 10 NTUs above the turbidity value of inflows. This standard is met in the segment of the Weber River where the project is located. The average turbidity upstream of the project at sampling point WR01 is 15.4 NTUs whereas the average turbidity below the project powerhouse (WR04) is 17.6 NTUs (an average 2.2 NTU increase above the turbidity value upstream of the project, although it is noteworthy that the maximum turbidity values are measured at WR01, upstream of the project).

Table 6. Weber River turbidity data (NTU's) collected in the project area (Source: PacifiCorp, 2018a).

Sampling Site	Minimum	Maximum	Average
WR01	0.0	74.8	15.4
WR03	0.0	69.3	18.1
WR04	3.5	62.3	17.6

Fish Resources and Aquatic Habitat

Aquatic Habitat

The physical characteristics and aquatic habitat of the river in the project area have been substantially altered from historical natural conditions with construction of I-84 freeway in 1968. Much of the river was channelized, and a large portion of the lower velocity/backwater environment was eliminated (Webber, et al. 2012). Further and potentially more substantial effects may result from water diversions and subsequent diminishment of flows throughout the Weber River Basin. Many such diversions do not have (or have very low) established minimum stream flows.

Within the project area the river flows through a narrow canyon. The substrate is typical of high gradient mountain streams in the Wasatch-Cache National Forest, consisting primarily of small boulders, small to medium cobble, gravel, and sand. Varying gradients define the primary substrate type in different areas. Some reaches are dominated by gravel and cobble while higher gradient sections are characterized by coarser substrate materials. Generally, aquatic habitat consists of riffles and runs with large gravel, cobble, and boulder substrate. However, portions of the stream were substantially altered to accommodate roadways. The lower 75 percent of the 10,600-foot-long bypassed reach contains more suitable fish habitat because of its moderate gradient (2.4 percent) and suitable substrate, as compared with the steeper gradient and coarser substrate in the upper bypassed reach (4.0 percent slope) and a short section of the lower bypassed reach immediately upstream of the powerhouse.

Fish Community

There are no anadromous fish in the Weber River system. However, there are populations of resident fish species, and at least one fluvial species. Fish species present in the bypassed reach are rainbow trout (*Oncorhynchus mykiss*), Bonneville cutthroat trout (*O. clarki*), brown trout (*Salmo trutta*), mountain whitefish (*Prosopium williamsoni*), mottled sculpin (*Cottus bairdii*), bluehead sucker (*Catostomus discobolus*), mountain sucker (*C. platyrhynchus*), Utah sucker (C. ardens), speckled dace (Rhinichthys osculus), longnose dace (R. cataractae), redside shiner (Richardsonius balteatus), and common carp (Cyprinus carpio). Cutthroat trout, mountain whitefish, and brown trout make up more than 95 percent of the total biomass of game species in the bypassed reach. The Utah DWR rates the project reach of the Weber River as Class IIIB, a quality fishery with two species of special concern, Bonneville cutthroat trout and bluehead sucker. Bonneville cutthroat trout is also listed as a sensitive species by the Forest Service.

According to PacifiCorp's personal communication with Utah DWR's Paul Thompson on March 10, 2015 (as reported in the final license application), Utah DWR currently manages the Weber River in the project area for native Bonneville cutthroat trout, relying primarily on natural production to sustain the population. The Weber River in the project area is not currently stocked with fish and it supports both native and introduced fish species. There are some catchable sterile rainbow trout stocked in upstream reservoirs, and it is possible some of these fish move downstream into the project area. Any previously stocked fertile rainbow trout or cutthroat-rainbow trout hybrids are removed when discovered during annual fisheries surveys and other work.

The majority of information presented below relates to Bonneville cutthroat trout and bluehead sucker given these are the species of primary concern.

Bonneville Cutthroat Trout

The Bonneville cutthroat trout is the only subspecies of cutthroat native to the historic Lake Bonneville basin of Utah, Wyoming, Idaho, and Nevada. Pure strains of these fish are rare throughout their historic range but several Utah populations exist in Bear Lake and Strawberry Reservoir. Bonneville cutthroat trout have been petitioned twice for federal listing under the Endangered Species Act (ESA) in 1992 and 1998. In both cases the FWS found the species did not warrant federal protection. Most recently, on September 9, 2008, the FWS again concluded there was insufficient cause to list the fish as either threatened or endangered under the ESA (Federal Register 2008).

Continuing threats to Bonneville cutthroat trout include: (1) water development projects resulting in changes in the timing, magnitude, and duration of stream flows; (2) degraded aquatic habitat and water quality; (3) riparian habitat loss; (4) interruption of migratory corridors by man-made barriers; and (5) competition with, predation by, and hybridization with nonnative fishes (Lentsch et al. 2000). Because of these threats and to further cooperation toward protection of the species, both the State of Utah (Utah Bonneville Cutthroat Trout Team 2008) and Range-wide (Lentsch et al. 2000) Bonneville cutthroat trout Conservation Agreements and Strategies were developed. Recent genetic studies conducted by Utah DWR indicate that Bonneville cutthroat trout in the project area have a very low level of hybridization. Because of these numerous threats, this cutthroat subspecies is included on the Utah Sensitive Species List (Utah DWR 2015b). Bonneville cutthroat trout is also the Utah state fish.

Bonneville cutthroat trout primarily eat insects, but large individuals have been known to also eat other fish. Like most cutthroat trout, this subspecies spawns in streams in gravel substrate in the spring. Fish can be found in a variety of habitat types ranging from high elevation mountain streams and lakes to low elevation grassland streams and can also be found in natural lakes, such as Bear Lake, or in reservoirs. Within each

different habitat type, these fish require a functional stream riparian zone which provides structure, cover, shade, and bank stability plus crucial spawning habitat.

Utah DWR, FWS, Utah State University (USU), Trout Unlimited and various other partners collaborated on research and improvement projects in recent years to better understand and expand Bonneville cutthroat trout populations in the Weber River. A collaborative investigation initiated by Utah DWR, USU and Trout Unlimited in 2011 began documenting population structure, genetics, survival probability and adult migratory movements because of its relevance to population viability and persistence.

During this study, from 2011 to 2013, researchers implanted a total of 1,671 Bonneville cutthroat trout with passive integrated transponder (PIT) tags and documented movements in the Weber River from the canyon mouth and among tributaries located just upstream of the project using passive instream arrays (PIAs) installed in a number of the tributaries. There was frequent use of tributaries by the mainstem population for spawning and movement between the tributaries, suggesting a sizable fluvial life history component still exists in the Weber River and may play an important role in the population's long-term viability. Human-made barriers exist in all of the major tributaries, although some appear passable under certain conditions. Those on Strawberry and Gordon creeks have been impassable (Budy et al. 2014). However, according to PacifiCorp's personal communication with Utah DWR's Paul Thompson on October 12, 2017 (as reported in the final license application), the fish ladders that were installed on Strawberry Creek and Gordon Creek in 2016 do pass fluvial Bonneville cutthroat trout and smaller age classes of Bonneville cutthroat trout plus some resident cutthroat. Genetic mixing between mainstem and tributary populations was evident based on mitochondrial and otolith analysis, however, both populations appear to largely pure (Budy et al. 2014).

Using multiple-pass electrofishing, a population estimate of 405 Bonneville cutthroat trout occurring from the project diversion downstream 2.73 miles to the non-project Lower Weber Diversion was obtained in 2011 (Budy et al. 2014). Generally, there appears to be a trend toward increasing densities of Bonneville cutthroat trout moving upstream from the canyon mouth into the tributaries above the project diversion (Table 7). Length-frequency histograms for fish in the Weber River indicated the smallest individual collected from 2011-2013 was about 100 millimeters total length and the largest 550 millimeters, with an average length of about 300 millimeters (PacifiCorp 2015a).

Table 7. Bonneville cutthroat trout population estimates with 95% confidence intervals in three mainstem sections of the Weber River, Utah, in 2011 and 2012 (Source: PacifiCorp, 2018a, modified from Budy et al. 2014).

Year and Weber River Section	Sampled Distance	Electrofishing Passes	Sampling Dates	Population Estimate (N hat)	95% Confidence Intervals
2011 Section 03 Lower Weber Diversion upstream to Powerhouse Diversion	Combined 1.8 of 4.4 km2.7	2 and 3 (combined)	15 Nov, 17 Nov, 29 Nov, 14 Dec	405	310-584
2011 Section 04 Powerhouse Diversion upstream to Peterson Creek confluence in Weber River, plus portions of multiple upstream tributaries	11.7 km7.3	4	20 July, 21 July, 26 Jul, 12 Aug	877	684–1,124
2012 Section 02 Canyon mouth upstream to Lower Weber Diversion	Lower 19 km of 20 km 12reach	2	19 June, 21 June	139	66–672
2012 Section 04 Powerhouse Diversion upstream to Peterson Creek confluence in Weber River, plus portions of multiple upstream tributaries	9.5 km	2	8 Aug, 16 Oct	1,296	911–2,069

Bluehead Suckers

Bluehead suckers are native to parts of Utah, Idaho, Arizona, New Mexico and Wyoming. The species occurs in the upper Colorado River system, the Snake River system, and the Lake Bonneville basin, although recent work suggests the Snake and Lake Bonneville populations (including the Weber River fish) are a genetically distinct group from those occurring in the Colorado River system (Hopken, et. al., 2013).

In Utah, bluehead suckers have been reduced in numbers and distribution due to flow alteration, habitat loss or alteration, dams and diversions, and the introduction of nonnative fishes. Consequently, the bluehead sucker is included on the Utah Sensitive Species List (Utah DWR 2015b). Both Range-wide (Utah DNR 2006b) and (Utah DNR 2006a) Conservation Agreements and Strategies were developed for bluehead suckers to foster cooperation toward the protection of the species. The following are among the recommended conservation actions in these agreements: (1) conduct population surveys; (2) examine life history and habitat needs; (3) genetically characterize populations; (4)

maintain and enhance important habitats; (5) control nonnative fishes where feasible; (6) expand populations; and (7) continue monitoring populations in the longer term (Utah DWR 2006a).

The bluehead sucker is a benthic species with a mouth modified to scrape algae from the surface of rocks. Algae is the primary food of the species. Bluehead suckers spawn in streams during the spring and early summer. Spawning usually takes place when stream temperature reaches about 16 °C (Utah DWR 2006a) and has been estimated as occurring in the Upper Colorado River Basin between about 18° and 24 °C (Ptacek et al 2005). An early study suggested bluehead suckers in the Weber River have a rather protracted spawning period based on gonadal index, extending from early May to late July (Andreasen and Barnes 1975). During that time period, average daily temperatures in the Weber River between 1995 and 2006 ranged from about 12° to 20 °C (PacifiCorp 2015). During the water quality studies conducted between February 2016 and January 2017 temperatures in the Weber River ranged from just below 0° to nearly 21°C. Average monthly temperatures ranged from just under 1 °C to over 17.5 °C with the lowest temperatures recorded in December and January and the highest temperatures recorded in July and August.

Habitat use differs according to life stage, with larvae and young-of-year fish occupying low velocity habitats along stream margins after drifting some distance from spawning areas. Seasonal timing of larval emergence and drift is contingent on when spawning occurs and temperature-dependent egg development. As bluehead suckers grow, they often relocate to higher velocity habitats with greater cover (Utah DWR 2006a), though some research indicates use of pools with rocky substrate year-round (Sweet and Hubert 2010). Bluehead suckers do not thrive in impounded waters, tending to utilize swifter habitats than many other suckers (Utah DWR 2006a). Generally, adult bluehead sucker occurrence is correlated with habitats where cobble substrate is dominant; most likely due to their feeding habits. Juvenile occurrence can be negatively affected by partially desiccated sections of river (Bower et al. 2008). Overall, the literature regarding adult bluehead sucker movements is limited, but generally indicates they may be quite sedentary or undergo substantial migrations depending on the system (Ptacek et al. 2005).

Genetic studies have confirmed that bluehead sucker populations in the Upper Snake, Bear, and Weber Rivers are distinct from those in the Colorado River Basin, and as such, are deserving of protection (Douglas et al. 2009). Concomitantly, various efforts were undertaken recently by Utah DWR, USU and others to better understand demographics, life history, and habitat requirements of Weber River bluehead suckers.

The bluehead sucker is present in the Weber River occupied by the project but also extending upstream and downstream of the project (Webber, et al. 2012). Bluehead sucker populations are managed by Utah DWR in a 43-mile reach of the

Weber River between the BOR Echo dam and reservoir and the confluence with the Ogden River. The populations in the lower river (project area and downstream) appear to be the most robust (Webber et al. 2012). Generally, the research conducted to date indicates that the population in the Weber River downstream of the project area, from the canyon mouth to the Ogden River confluence, is somewhere in the hundreds and is experiencing some limited recruitment. Bluehead suckers are known to occur upstream from the project diversion with an estimated population between Echo Reservoir and the town of Morgan between 150 and 300 individuals. To what extent spawning and recruitment occur upstream from the project to Echo Dam is not understood at this time. However, multiple (approximately eight) congregations of individuals displaying spawning characteristics have been documented in the same area.

Movements of PIT-tagged bluehead suckers (all >150 millimeters) were evaluated using a passive antenna in the 12-mile section of the river between Rockport Reservoir and Echo Reservoir (both upstream of the project area) from September to March 2007 to 2008. The greatest movement recorded was 2.6 km upstream. Nearly all movements were <1 km (62 percent) and during September. Most detections (88 percent) occurred at night (Webber et al. 2012). These movements are likely shortened due to thermal restrictions in the habitat as the upper 6 miles within this reach are likely too cold to provide adequate bluehead sucker habitat due to the location of the tailwater release at the bottom of the dam at Rockport Reservoir.

Current research has been directed at identifying spawning areas in the lower section of the Weber River (i.e., below the canyon mouth) during late spring and quantifying habitat in these spawning reaches to assess what factors may limit recruitment. Research has also determined that higher numbers of young-of-year bluehead suckers are found in low velocity habitats in that portion of the river. Abundance was positively associated with maximum backwater depth (Budy et al. 2017). Low velocity habitats along the river margins are relatively rare in the river upstream from the Weber Project due to much channelization, higher gradient and altered hydrology. The project reservoir, however, could provide suitable rearing habitat for bluehead suckers that are spawned above and below the diversion in this reach of the Weber River.

Mountain Suckers

Mountain suckers occur in most of the western United States and parts of western Canada. A native species in Utah, the mountain sucker is found in the Lake Bonneville basin and the Colorado River system. This species prefers clear, cold water of streams with gravel substrate. Mountain suckers are benthic oriented and feed on algae, higher plants, and sometimes invertebrates. The species spawns during the spring and early summer in gravel riffles. Because mountain suckers are small (about

six to eight inches) and are often found in trout waters, this species is an important food item for trout.

Mountain Whitefish

This species is native to the western United States and western Canada. Mountain whitefish prefer cold mountain lakes and are common in many areas of Utah. Food habits include insect larvae, insects, fish eggs, and small fish. They feed most actively at night and during the winter. Mountain whitefish spawn in the late fall to early winter, usually in stream riffle habitat with gravel substrate.

Mottled Sculpin

The mottled sculpin is native to both eastern and western North America. The species is common in Utah and can be found in many of Utah's cold water streams. Mottled sculpin are benthic organisms and are important forage for stream dwelling trout. These sculpin feed on aquatic insects, small fishes, crayfishes, fish eggs and plant matter. Mottled sculpin spawn in the late winter through early spring.

Utah Sucker

Utah suckers are still found within their native range in southeastern Idaho and western Wyoming in the Bear River drainage and along the western front range of the Wasatch Mountains in Utah along with parts of Nevada and the Snake River upstream of Shoshone Falls; all of which is part of the ancient Lake Bonneville (Sigler and Sigler 1987 and 1996). The Utah sucker spawns in the spring over shallow gravel or sand in small streams or lakeshores.

Speckled Dace

Speckled dace are a widely distributed native species in western North America and found in a variety of habitats. They are primarily feed on insects, plankton, freshwater shrimp, and plant material. These fish typically spawn in mid- summer in stream riffles.

Longnose Dace

The longnose dace, another native species, has a much more extensive range than the speckled dace ranging from northern Mexico to the Northwest Territories in Canada and southward in the Appalachians to Georgia. They are adapted to benthic life in fast- flowing streams and feed on drift organisms or immature aquatic insects. Longnose dace typically spawn in late spring or early summer over gravelly riffle areas.

Redside Shiner

Redside shiners, another small native species, are found in North America generally west of the Rocky Mountains. These fish are a schooling species found in lakes, ponds, and slower moving rivers and streams. Redside shiners feed primarily on invertebrates, zooplankton, and algae, but may also consume mollusks, fish eggs, and smaller fishes. Redside shiners spawn in the late spring or early summer in shallow gravelly areas.

Brown Trout

Brown trout, a nonnative species introduced as a game fish, have become established in many of the cool and cold water streams in Utah. Their diet consists of primarily fishes, but they are opportunistic and are known to consume amphibians, rodents, and invertebrates including insects, snails, and crayfish. Because of their piscivorous nature, brown trout often have a detrimental effect on populations of native and nonnative sport fishes. The brown trout spawn in the fall in the gravel substrate of streams. While brown trout do not appear to be the majority species in the project reach, they are sought after by anglers because of their size.

Rainbow Trout

The rainbow trout is native to western North America but it is not native to Utah. It has been introduced to cool waters throughout the state. Because it is a popular sport fish and because most of the stocks used by Utah DWR are now considered sterile, millions of fish are stocked in Utah state waters.

Rainbow trout prefer to eat invertebrates including insects, worms, zooplankton, and insect larvae. Larger rainbows can become piscivorous. The species spawns in streams over gravel substrate during the spring. In areas where rainbow trout and cutthroat trout co-exist rainbow-cutthroat hybrids can occur. Loss of genetic purity of cutthroat trout is considered one of the major threats to Utah's native cutthroat trout, especially the Bonneville strain.

Common Carp

The common carp is not native to North America but is found in every mainland state in the U.S. Common carp were introduced to North America primarily as a food source for workers building the trans-continental railroad in the 1800s. Carp feed primarily on zooplankton but their diet may also include detritus and benthic organisms. They typically spawn in large groups over silt or vegetation in the shallow, warmer areas of lakes or rivers. Spawning and feeding activities can create a lot of turbidity which can inhibit feeding behavior of other species in the vicinity.

Rare, Threatened, and Endangered Aquatic Species

There are no known federally listed threatened, endangered, or candidate fish species in the Weber River. The Utah DWR rates the project reach of the Weber River as Class IIIB, a quality fishery with species of special concern (Bonneville cutthroat trout and bluehead sucker). Bonneville cutthroat trout is also listed as a sensitive species by the Forest Service.

3.3.2.2 Environmental Effects

Construction Effects on Water Quality and Aquatic Resources

PacifiCorp proposes to construct a fish ladder in a manner that minimizes adverse effects on water quality and aquatic resources in the project area. A total of 0.16 acre of earthmoving and construction activities are planned for fish ladder construction. PacifiCorp proposes to use BMPs to control erosion, prevent the spread of aquatic invasive species, manage storm water, control weeds, and complete revegetation and related site reclamation following fish ladder construction activities, as required by regulatory authorities. If construction requires active work below the ordinary high-water mark, PacifiCorp proposes to isolate the area behind a coffer-dam and to pump excess water to unsaturated upland vegetated areas for infiltration. PacifiCorp proposes to construct the fish ladder over nine months and complete it within a single in-water work period, from October through December.

Excavation in or near the Weber River stream channel would be required during construction of the proposed fish ladder and would have the potential to cause erosion, sedimentation and to result in spills of fuels and lubricants to the Weber River. Construction of this facility would likely cause short-term adverse effects on aquatic resources in the Weber River due to reduced streamflows while construction is taking place, disturbance of aquatic habitat within and adjacent to the construction zone, and temporary increases in turbidity and sedimentation.

Utah DEQ requires the following conditions in the WQC for construction of the fish ladder: (1) no construction activity from February to June; (2) during and after construction PacifiCorp should continue to coordinate with project stakeholders, for work related to, but not limited to, channel dewatering, fish salvage, and fish trap operation and maintenance; (3) construction should be accomplished during a period of low flow, and sediment discharges into stream flows during construction must be limited through the use of BMPs to minimize increases in turbidity downstream, and flows must be diverted away from the construction area using a non-erodible cofferdam or other means of bypass; (4) prior to the start of construction either identify an area within the project boundary to store the excavated, a minimum 50 feet from the Weber River and protected

using proper BMPs to prevent discharges into the Weber River, or develop and implement a plan to transport the excavated material offsite for storage in an upland location or disposal; (5) develop and implement a refueling plan that addresses fueling actions and spill prevention and containment measures for a variety of equipment and locations, and storage of lubricants and fuels with secondary containment unless storage of lubricants and fuels plan has been developed and approved by Utah DEQ; (6) implement appropriate BMPs to minimize the erosion-sediment and nutrient load to any adjacent waters during project construction; and (7) fill material may not be used which may leach organic chemicals (e.g. discarded asphalt), noxious weeds and seeds or nutrients into the Weber River.

The Forest Service includes two 4(e) conditions related to construction that require PacifiCorp to implement erosion and sediment control BMPs for locations, on, or directly affecting, NFS lands and requires PacifiCorp to continue to maintain, update and implement the site-specific Oil Spill Prevention, Control and Counter measure Plan (SPCC Plan).

Our Analysis

Fish ladder construction would result in ground disturbing activities at the project diversion. A large portion of the area (approximately 31 percent) is currently developed surface (asphalt/concrete). Most of the remaining site area is currently un-vegetated and previously disturbed ground adjacent to the ice chute. It is highly likely that construction would require ground disturbance in an area below the ordinary high waterline, which would need to be isolated behind a cofferdam to prevent sediment transport and associated water quality impacts. If dewatering of the work area behind the cofferdam is necessary, water would be pumped to unsaturated upland vegetated areas for infiltration.

Installation of a cofferdam to isolate the in-water work area would require disturbance of the river bottom of the Weber River. Once the cofferdam is in place and the area is dewatered, the aquatic habitat would be unavailable to aquatic organisms until construction is complete. Installation of the fish ladder would result in a permanent reduction of about 0.10 acre of stream habitat adjacent to the diversion dam. The permanent removal would have only a minor effect on habitat availability, however, because there is ample aquatic habitat in the Weber River both upstream and downstream of the project diversion.

PacifiCorp proposes to implement erosion control measures and other BMPs, as required by regulatory authorities to reduce sediment delivery to the Weber River during construction. PacifiCorp provides a general description of methods proposed for constructing the fish ladder and few if any details concerning specific BMPs to reduce construction effects such as sedimentation, pollution, and hazardous discharges on the aquatic resources. Including a detailed plan for constructing the fish ladder developed in

consultation with the resource agencies that would at a minimum address detailed construction methods including the need for a cofferdam, erosion and sediment control measures, pollution prevention measures, hazardous materials management, spoils management, and specific BMPs, would minimize anticipated adverse effects on aquatic resources in the Weber River. In order to be protective of aquatic resources, any construction plan for the fish ladder should include, but not necessarily be limited to, the following: (1) detailed descriptions of actual site conditions; (2) detailed descriptions, design drawings, and locations of erosion control measures; (3) detailed descriptions and locations of all revegetation measures; (4) detailed descriptions and locations of actual BMP's to be used, including storm water pollution prevention measures, hazardous materials management, and spoils management; and (5) a specific implementation schedule. In addition, a provision for PacifiCorp to immediately report to Utah DEQ when any spill or discharge of oil or other substances occurs would allow for rapid consultation with Utah DEQ to assist with development of appropriate response actions to rapidly minimize and ameliorate adverse effects on water quality.

Even with implementing BMP's to minimize erosion there would still be some short-term increases in turbidity during project construction that could exceed the background levels. Short-term increases in turbidity could affect resident trout downstream of the construction site by increasing physiological stress (Redding et al., 1987) and lowering feeding success due to a reduction in reactive distance to drifting prey (Barrett et al., 1992). Elevated turbidity levels downstream the construction site would be temporary and normal levels should return a short time after sediments pass through and settle out in lower velocity areas downstream. If dewatering of the construction area behind the cofferdam is necessary, PacifiCorp proposes to pump water to adjacent unsaturated upland vegetated areas for infiltration. Because the pumped water would be contained on site, and filtered through vegetated land, water quality monitoring every two weeks would not be necessary, consistent with Utah DEQ's condition.

In addition to elevated turbidity levels, construction activities could potentially increase pH levels in the Weber River. Concrete used during construction may cause concrete leachate to enter the river through stormwater runoff which could result in increased pH levels. While little information is available addressing salmonid tolerance to changes in pH, effects on rainbow trout appear to show that pH levels between 5.0 and 9.0 are acceptable (Deas and Orlob, 1999). Managing stormwater runoff and hazardous materials through effective BMPs would minimize adverse effects on the aquatic resources. The anticipated shift in pH as a result of any stormwater runoff would be expected to be short-term and pH levels would return to existing levels a short time after construction is completed. Any short-term increases in pH as a result of construction would not have any long-term adverse effects on water quality or the aquatic resources in the Weber River.

With regard to protecting fish during dewatering of the cofferdam, developing and implementing a fish salvage plan, and coordinating fish salvage with stakeholders as required by Utah DEQ's condition, would help prevent or minimize mortality of any fish that are trapped within the cofferdam when it is dewatered at the start of construction.

PacifiCorp anticipates construction of the fish ladder and trap would take approximately 9 months and be completed within a single in-water work period. They state that ideally construction would occur during the lowest flow portion of the year, from October through December. While these river conditions are targeted to support fish ladder construction, the necessary 9-month duration of construction activities would require work outside of the ideal low-flow timeframe. Utah DEQ's water quality certification stipulates that construction of the fish ladder occur only from June through January to allow for the migration and spawning of Bonneville cutthroat trout and bluehead sucker. PacifiCorp does not provide a detailed schedule when construction would begin, when it would be completed, and when the fish ladder would become operational. Including a construction schedule developed in consultation with the resource agencies and consistent with Utah DEQ's water quality certification would serve to minimize adverse effects on Bonneville cutthroat trout and bluehead sucker.

Project Operation Effects on Water Quality

Project operations including the withdrawal of water from different levels within the reservoir and passing it either over a spillway or releasing it from a powerhouse can affect downstream water temperature and dissolved oxygen concentrations.

As discussed previously, PacifiCorp proposes to continue to operate the project in run-of-river mode and would maintain the existing minimum flow regime in the bypassed reach throughout the year. Utah DFW and FWS recommend and Forest Service requires a run-of-river operation and maintenance of the existing minimum flow regime. No additional water quality measures are proposed, recommended, or required.

Our Analysis

As discussed in the *Aquatic Resources, Affected Environment*, PacifiCorp collected water quality samples in 2016 and in early 2017 at the upper end of the project reservoir, immediately upstream of the diversion dam, within the bypassed reach, and in the catch basin of the powerhouse. The results show that pH levels were within the range established under the state standards at all times. The results also showed that dissolved oxygen concentrations were at or above levels established by the state standards at all times below the powerhouse but were below the levels set by the standards for a few instances within the bypassed reach in late September and early October when DO concentrations in the river upstream of the project reservoir were also at levels below those established by state standards and were extremely low. In those instances, the DO

concentrations within the bypassed reach exceeded the DO measured upstream of the project reservoir. Water temperature recorded in the project area were at levels below the maximums established under by the state standards, except for 15 days in July and August when the levels were slightly higher in the bypassed reach just above the powerhouse. Continuing to operate the project in run-of-river mode and maintaining the existing minimum flow regime released to the bypassed reach would continue to maintain water quality conditions in the Weber River in the project area for protection of the aquatic resources.

Bypassed Reach Minimum Flows

To maintain the environment for protection of the aquatic resources in the bypassed reach, PacifiCorp proposes to continue to release the minimum flows required by the existing license. PacifiCorp is required to release from the diversion dam to the bypassed reach a minimum flow of 34 cfs or inflow, whichever is less, from October 1 through March 31, and a minimum flow of 34 to 50 cfs (range dependent on the annual runoff forecast) or inflow, whichever is less, from April 1 through September 30. PacifiCorp proposes to continue to release minimum flows through the existing calibrated ice chute gate and the remainder of the minimum flow released through the new fish ladder, to act as an attraction flow.

FWS and Utah DWR recommend and the Utah DEQ's 401 WQC and the Forest Service's 4(e) conditions stipulate that PacifiCorp continue to release the existing license minimum flow regime to the bypassed reach of 34 cfs or inflow, whichever is less from October 1 to March 31, and a continuous minimum flow of 34 to 50 cfs (dependent on annual runoff forecast), or inflow, whichever is less from April to September 30; once the fish ladder is installed and operational, a portion of the required minimum flow (about 20 cfs) should be passed through the fish ladder and the remainder (about 14 to 30 cfs) should be used as attraction flow for protection of the aquatic resources.

Our Analysis

Minimum Flows

Project operations affect flows in the Weber River bypassed reach. Operating the project in the proposed run-of-river mode would ensure that all diverted water is returned to the Weber River downstream of the powerhouse for the protection of aquatic resources. Therefore, during normal operating conditions, project operation would have no effect on flows above the diversion or below the powerhouse.

Based on the results of the instream flow study conducted for the project in 1988 (Utah Power and Light Company and Ecosystems Research Institute, 1988), the existing minimum flow regime would ensure that suitable habitat conditions are maintained for

the fisheries resources in the bypassed reach during project operation, particularly for adult and juvenile Bonneville cutthroat trout life-stages, which are the Utah DWR targeted management species for aquatic habitat in the bypassed reach. In the 6,150-foot-long, lowest gradient segment of the bypassed reach (58 percent of the bypassed reach), the minimum flows of between 34 and 50 cfs, depending upon the time of year, would maintain from 90 to 100 percent of the maximum juvenile cutthroat trout weighted usable area (WUA) and 80 to 90 percent of the maximum adult cutthroat trout WUA. In the upper 2,650 feet of the bypassed reach (25 percent of the total reach), the 34 to 50 cfs minimum flow would maintain 40 to 50 percent of the maximum adult trout WUA.

Adult habitat typically limits the population biomass of resident trout in most rivers (Behnke, 1992); therefore, protecting adult habitat in the bypassed reach, as would occur with the proposed minimum flows, would maintain trout population biomass in the bypassed reach. Continuing the existing minimum flow regime would provide suitable aquatic habitat in the bypassed reach and serve to maintain a self-sustaining Bonneville cutthroat trout population in the Weber River that exhibit both resident and fluvial strategies, moving from the river to various tributaries and even between tributaries to spawn.

Minimum Flow Compliance Monitoring

Minimum flows are currently released through the existing ice chute, controlled with a slide gate at the upstream end. The slide gate is partially closed to limit flow releases and changes in forebay elevation have little effect on flows through the gate opening. The gate is calibrated annually and is operated such that the required minimum flow is passed even when the forebay is at the low end of its range of fluctuation. A flow quantity slightly higher than the required minimum flow is passed when the forebay is higher in its range of fluctuation. Once the proposed fish ladder is installed, a portion of the minimum flow would be passed through the fish ladder to act as attraction flow. The remainder of the flow would continue to be passed through the existing minimum flow gate and ice chute. After installation of the fish ladder, a flow evaluation would be completed to determine the range of flow through the ladder corresponding to the range of normal forebay fluctuation. The existing minimum flow gate would then be calibrated to pass the remainder of the required minimum flow.

PacifiCorp did not specify in its FLA how it would specifically monitor and report compliance with its run-of-river operation and minimum flow proposal. We therefore assume that PacifiCorp would continue to monitor compliance with run-of-river operation and minimum flows using a staff gage or calibrated gate openings.

Our Analysis

Although compliance measures do not directly affect environmental resources, they do allow the Commission to ensure that a licensee complies with the environmental requirements of a license. Therefore, operation compliance monitoring and reporting are typical requirements in Commission-issued licenses.

While PacifiCorp currently monitors compliance with run-of-river operation and minimum flows using a staff gage or calibrated gate openings, it does not propose formalized monitoring protocols or reporting requirements to verify compliance with run-of-river operation or minimum flow releases. Formalizing the methods for monitoring and reporting compliance with PacifiCorp's proposed minimum flows, and any other operating requirements included in any new license issued, would provide a mechanism for reporting operational data and deviation, and ensure the implementation of operational measures that are designed to protect and enhance the environmental resources of the project area.

Upstream Fish Passage

The Weber Project diversion dam currently serves as a partial barrier to upstream migrating Bonneville cutthroat trout, bluehead suckers, and other fish resources in the Weber River. Bluehead sucker and Bonneville cutthroat trout have experienced extensive population declines and range contraction because each reach in the Weber River supporting these two species has been fragmented by dams and diversions threatening the population resiliency, genetic diversity, and long-term persistence of both species (Behnke and Zarn, 1976; Lentsch et al., 2000; Hopken et al., 2013; Douglas and Douglas, 2009). Bluehead sucker occur in three remaining fragmented reaches with the strongest population in the Weber River in the reach below the non-project Lower Weber diversion dam located 2.7 miles downstream of the project diversion dam. Large fluvial Bonneville cutthroat trout have been virtually eliminated from river mainstems rangewide, but still persist within isolated mainstem segments of the Weber River, unable to migrate back to spawning grounds in tributary streams (Federal Register, 2008; Lentsch et al., 2000).

PacifiCorp proposes to construct, operate, and maintain a fish ladder suitable for upstream passage of both Bonneville cutthroat trout and bluehead sucker, so that both species can access upstream habitat. In addition, PacifiCorp proposes to include a removable fish trap at the upstream exit of the fish ladder to be used by Utah DWR and Trout Creek and maintained by PacifiCorp.

As stated in the MOA, FWS and Utah DWR recommend—and the Utah DEQ requires by 401 WQC condition and the Forest Service requires by 4(e) condition—that

PacifiCorp construct and operate a fish ladder suitable for upstream passage of both Bonneville cutthroat trout and bluehead sucker and include a fish trap.

Our Analysis

Bonneville Cutthroat Trout

The project dam is a partial barrier to upstream fish passage. Existing evidence suggest it remains impassable under most river flow conditions (PacifiCorp, 2017). Utah DWR tagging studies demonstrated that 28 Bonneville cutthroat trout moved upstream past the Weber Project diversion dam during spawning migrations in 2013 and 2014 (PacifiCorp, 2015a). There is no estimate, however, of the number of individuals that successfully pass upstream on an annual basis. Three pathways at the diversion dam are potential upstream passage routes: (1) an old historic non-operational fish passage structure (commonly referred to as the "ice chute" on the north side of the river that is used to pass minimum flows through a calibrated slide gate opening; (2) the spillway; and (3) a low-flow gate on the south side of the diversion. At lower flows, the first two pathways do not appear to be feasible due to a large terminal drop at the ice chute with very high velocities throughout and insufficient depths across the spillway. Trout are commonly observed by PacifiCorp personnel attempting unsuccessfully to ascend the ice chute outflow. It is also likely that at higher river flow and stage conditions both routes would remain impassable. The low-level gate when open is the most likely possibility for upstream passage, because of potentially suitable hydraulic conditions (sufficient water depth and velocity) and the timing of movements from past studies suggest it could have been used, although there has been no field verification of the exact pathway (PacifiCorp, 2015a).

Habitat fragmentation from dams and diversions and other human activities has caused many populations of fluvial Bonneville cutthroat trout to decline, including from the project dam in the Weber River (Federal Register, 2008) (Lentsch et al. 2000). Bonneville cutthroat trout in the Weber River depend upon tributaries upstream of the project diversion dam to spawn as part of their life cycle. As discussed in section 3.3.2.1, there is frequent use of tributaries by the mainstem population for spawning and movement between the tributaries, suggesting a sizable fluvial life history component exists in the Weber River and may play an important role in the population's long-term viability. According to PacifiCorp's personal communication with Utah DWR's Paul Thompson on October 12, 2017 (as reported in the final license application), Bonneville cutthroat trout in the Weber River exhibit a fluvial life history when they exceed 300 millimeters in total length. Length-frequency histograms for fish in the project area ranged from 100 millimeters to 550 millimeters, with an average length of 300 millimeters (PacifiCorp, 2015a).

Although fish passage exists at the project dam, it is marginal and only occurs at higher flows in some years. Installation of an upstream fishway would facilitate passage over a wider range of flows and more consistently from year to year with more efficiency and less delay. The likely result would be a more consistent annual spawning success rate (as fish are not limited in some years by inadequate flows for passage as occurs now) and a resulting long-term increase in population size both upstream and downstream of the dam.

Bluehead Sucker

The project dam is likely a barrier or at least a partial barrier to upstream bluehead sucker migration because of their lesser swimming and jumping abilities than Bonneville cutthroat trout. Bluehead sucker are present in the Weber River upstream, downstream and within the project bypassed reach. No formal studies on bluehead sucker migration have been conducted. Little is known about upstream migration past the project diversion or about movements of adult bluehead sucker during the spawning season (i.e., late spring and early summer) in the Weber River. However, movements are documented opportunistically through annual monitoring surveys conducted by Utah DWR.

It appears Bluehead sucker migrate relatively long distances in the Weber River to complete its life history requirements. The section of the Weber River upstream of the project between the town of Morgan and Echo Dam is the least fragmented reach of the Weber River and as such has produced the most complete movement data for Weber River bluehead sucker. Within this reach, bluehead sucker have been documented moving more than eight miles between monitoring survey years. Reaching spawning areas in the spring is the most likely explanation for this extent of bluehead sucker movement across monitoring survey years. Bluehead sucker are routinely found seven miles from their last capture site from year to year within this reach. Movements of approximately seven miles have also been documented within the timeframe of one month (both upstream and downstream).

Construction and operation of upstream fish passage facilities at the project dam would facilitate the continuing effort to restore bluehead suckers, classified as a sensitive species in the Weber River. Functional upstream fish passage facilities would improve habitat connectivity for bluehead suckers, and other fish resources in the project area. Improved connectivity would benefit juvenile bluehead sucker by providing access to suitable backwater rearing habitat in the project reservoir, a habitat type which is lacking in the Weber River downstream of the project diversion.

Fish Ladder Design, Operation, and Maintenance

PacifiCorp proposes to design, construct, operate, and maintain a vertical slot fish ladder designed for upstream passage of Bonneville cutthroat trout and bluehead sucker.

Conceptual design drawings of the proposed fish ladder are attached as Appendix C in the FLA.

PacifiCorp proposes to install the fish ladder on the north side of the spillway, immediately adjacent to the ice chute where the minimum flow is released. The conceptual design would allow the ladder to operate under the existing range of forebay water level fluctuations and would provide an appropriate attraction flow to enable fish to detect and swim into the ladder entrance. The conceptual fish ladder design has a water surface elevation drop of 9 inches per pool (across approximately 17 pools based on the conceptual design).

The proposed fish ladder would operate anytime the forebay is at full pool. When the forebay is dewatered during maintenance, the fish ladder would not be operational. However, at these times the low-level gate would normally be opened to allow fish passage. When the forebay is dewatered and the low-level gate is inoperable for more than 10 days due to extreme winter icing conditions or flow conditions, PacifiCorp would consult with the resource agencies and open the low-level gate as soon as possible. In the event of a prolonged project outage, PacifiCorp proposes to keep the forebay full, if possible, to ensure fish ladder operation and consult with the resource agencies to discuss fish ladder operation during any interim periods exceeding 10 days, when neither the low-level gate nor the fish ladder are operable.

When the forebay is at full pool the fish ladder would remain in operation for river flows of 34 cfs to approximately 2,500 cfs. A portion of the required minimum flow (20 cfs) would be passed through the fish ladder to act as attraction flow. The remainder of the minimum flow (14-30 cfs more) would be passed through the existing minimum flow gate and ice chute. PacifiCorp proposes to alter the gate prioritization and use the south spillway gate for forebay level control, rather than the north spillway gate to improve fish attraction conditions at the ladder entrance. Although PacifiCorp believes altering main gate operation to the south spillway gate would correct attractant conditions at the fish ladder entrance generally, under certain high flows where both gates are needed, the fish ladder entrance will likely be under water until the high river flow levels recede. This change in gate prioritization requires some mechanical retrofits to the south spillway gate which would be completed as part of the new fish ladder construction.

The proposed removable fish trap would be installed by PacifiCorp at the upstream exit to the fish ladder. It would likely be constructed of bar rack material with clear spacing close enough to prevent passage of fish. Once installed, Utah DWR and Trout Unlimited would use and maintain the fish trap until PacifiCorp uninstalled it. Construction and major maintenance of the proposed fish trap would be completed by PacifiCorp. The trap would serve as a temporary sampling facility to enumerate successful passage of target species. When the fish trap is not in operation it would be removed from the water to prevent debris collection. PacifiCorp would consult annually

with Utah DWR, Trout Unlimited, and the Forest Service related to fish ladder and trap operation and maintenance according to a Communication Plan developed between Utah DWR, Trout Unlimited, Forest Service, FWS, and PacifiCorp.

PacifiCorp anticipates debris maintenance would increase at the project with the proposed fish ladder and trap due to the flow obstructions that would likely result from the proposed fish ladder design. The proposed fish ladder would include a coarse-spaced bar rack at the upstream end and a number of pools and baffles with 12-inch-wide vertical slots. The coarse-spaced bar rack is intended to prevent large debris from entering the fish ladder and would be cleaned regularly to allow fish to freely pass upstream into the forebay. The coarse-spaced bar racks should filter out most debris that would be large enough to get caught in the 12-inch-wide vertical slots between the ladder pools. The fish ladder would be routinely inspected and cleaned of debris as required to maintain effective fish passage. Cleaning or maintenance efforts may occasionally require temporarily shutting off flow through the fish ladder. During such times the project minimum flow compliance would be attained via increased flow release at the existing minimum flow gate or a spillway gate.

FWS and Utah DWR recommend and the Utah DEQ requires by 401 WQC condition and the Forest Service requires by 4(e) condition that PacifiCorp construct and operate a fish ladder. The resource agencies also recommend and require that PacifiCorp develop and implement a fish passage consultation and communication plan in consultation with Utah DWR, FWS, Utah DWQ, and Trout Unlimited, to provide a forum for PacifiCorp to consult on the fish ladder and passage, operations for passage, and fish ladder issues and outages.

Our Analysis

Fish Ladder Design, Operation, and Maintenance

The proposed fish ladder would be a new structure at the project and its design would require considerations such as proper placement along the dam, range of forebay fluctuations, and attraction flows to assist he target species at finding the ladder entrance.

PacifiCorp's proposed operation for the conceptual fish ladder design considers appropriate criteria, including flows to attract fish into the fish ladder entrance, operation over a range of forebay and tailwater flow conditions, water levels, and water velocities. The entrance to the proposed fish ladder would be located immediately adjacent to the existing minimum flow release location, therefore the entire quantity of minimum flow would act as attraction flow to guide fish toward the proposed fish ladder entrance.

When designing fishways, the defining parameters of water velocity and water depth within the structure are generally determined by the forebay elevation. As

elevation of the forebay affects the water velocities and water depths in the fish ladder, the range of fluctuation in forebay elevations must be reviewed to confirm that fish passage would be provided throughout the operational range. The existing normal range of forebay fluctuation at the Weber Project is considered to be +/- 3 or 4 inches above and below the normal forebay elevation of 4,789.2 feet msl at the spillway crest (but may fluctuate as high as 7 inches). This range of forebay fluctuation would not have a substantial effect on the water velocities or water depths within the proposed fish ladder, therefore no changes would be needed to the existing project operations because of the range of forebay fluctuations.

However, the north spillway gate is currently operated for forebay level control. As the river flow increases above the hydraulic capacity of the turbine, excess flow is discharged through the north spillway gate immediately upstream of and adjacent to the proposed fish ladder entrance. As river flow increases, discharge through the north spillway gate would exceed the fish ladder attraction flow that would be released immediately downstream. This operation would effectively inundate the attraction flow from the proposed fish ladder and make it more difficult for fish to find the fish ladder entrance during spill conditions. Under this situation, altering main gate operation to the south spillway gate would correct potential adverse fish attraction conditions at the fish ladder entrance. Under certain high flows where both spillway gates are needed, the fish ladder entrance will likely be under water until the high river flow levels recede.

While PacifiCorp provided a conceptual design of the fish ladder in the FLA, it did not propose to develop a detailed, final design in consultation with the resource agencies. Developing detail design drawings in consultation with the agencies would increase the likelihood that the fishway design provides upstream passage for Bonneville cutthroat trout and bluehead sucker.

PacifiCorp proposes to routinely inspect and clean the fish ladder of debris as required to ensure that it functions as designed. The operation and maintenance of the fish ladder and fish trap would be dependent upon their final designs. A fish ladder and trap operation and maintenance plan, developed in consultation with the resource agencies, would provide a set procedure for operating and maintaining the facility. In addition, to ensure that these facilities are generally operated as designed, PacifiCorp could develop and implement a methodology as part of the upstream fish passage plan to conduct a one-year effectiveness evaluation.

PacifiCorp does not identify a specific need or project-related public benefit of consulting annually with Utah DWR, Trout Unlimited, and the Forest Service related to fish ladder and trap operation and maintenance according to a Communication Plan developed between Utah DWR, Trout Unlimited, Forest Service, FWS, and PacifiCorp. PacifiCorp would operate and maintain the fish ladder and trap by following specific operation and maintenance procedures developed as part of the upstream fish passage

plan in consultation with the resource agencies and approved by the Commission. With proper evaluation, operation, and maintenance, there is no reason to believe that the fish ladder and trap would not perform as designed.

Fish Trap

The proposed removable fish trap would allow PacifiCorp to collect information for the Commission to determine whether the ladder is functioning as intended for Bonneville cutthroat trout and bluehead suckers, and to direct PacifiCorp to make any necessary adjustments to ladder operation during a short-term evaluation period. The information would be used as part of the fishway effectiveness evaluation discussed above.

Fish Entrainment and Turbine Mortality

Bonneville cutthroat trout, bluehead suckers, and other resident fish entering the unscreened intake at the project diversion structure may be entrained into the penstock and powerhouse as they attempt to pass through the project area. Any fish entrained into the penstock would encounter the turbine at the powerhouse and be subject to potential injury or mortality due to pressure changes and blade strikes.

PacifiCorp does not propose a measure to prevent entrainment of fish into the project intake because multiple paths exist for fish of all sizes to migrate downstream past the project without passing through the turbine. With construction of the fish ladder and modification of the existing ice chute as attraction flow coupled with spill, which can occur more often during the higher flow periods, there are several avenues for fish to move downstream without having to go through the turbines.

Our Analysis

Fish Entrainment

While any fish species may become entrained by the project, Bonneville cutthroat trout and bluehead sucker are of concern to the federal and state fish and wildlife agencies due to their affinity to the Weber River upstream and downstream of the project dam, their reduced population numbers throughout their range, and their Utah State sensitive status.

Bonneville cutthroat trout and bluehead sucker exhibit life history characteristics that render certain life stages vulnerable to entrainment at the project intake. Bonneville cutthroat trout in the Weber River exhibit both resident and fluvial strategies, moving from the river to various tributaries and between tributaries during spawning. Utah DWR has documented adult fish moving upstream past the project

diversion. Larvae, young-of-year and other juvenile Bonneville cutthroat trout may also travel downstream during certain times of the year, although this has not been studied in the Weber River (PacifiCorp, 2015a). However, downstream movement of larvae or juvenile fish appears likely based on studies in other river basins (Lentsch et al., 2000). Adult suckers may undergo spawning and other migrations of varying distances and have been documented in the Weber River below the project (Webber, et al. 2012). For many riverine fish species, spring and summer are generally the time periods when peak movements of adult and juvenile fishes occur. The two species of concern in the Weber River appear to be no exception based on ongoing studies (PacifiCorp, 2017). Adults move primarily during spring in association with spawning. Juveniles, particularly young-of-year, may be displaced by higher flows during the spring or disperse downstream from potentially more crowded areas in the spring and summer.

It is possible that adult fish will attempt to move downstream past the diversion, through the intake (rather than through the ice chute, the spill gates, or the low-level gate when open, all of which potentially provide downstream passage), where there is a potential risk of entrainment into the project turbines. To become entrained into the penstock and pass through the project turbine, fish would have to pass through the existing trash rack, located upstream of the intake gates. Trash rack bar spacing at the project varies between 1.25 and 1.5 inches. The spacing of the trash rack bars would prevent many adult fish from being entrained but smaller fish would potentially be susceptible to entrainment. This was confirmed during pre-filing entrainment studies at the project when introduced dead trout less than 8 inches passed through the trash rack. However, because of their length, many if not most adult Bonneville cutthroat trout (ranging from about 300 millimeters to more than 600 millimeters [12 to more than 23.5 inches] in the Weber River project vicinity) and bluehead sucker (ranging from about 350 to 600 mm [13.75 to 23.5 inches]) would be excluded from passing through the project trash rack.

During normal operating conditions approach velocities measured just upstream of the project trash rack in mid-summer ranged from 1 to 1.5 feet per second (fps). Ideally, approach velocities should be kept within the fish cruising speeds to reduce impingement or entrainment potential (OTA 1995). Prolonged swimming speeds in the range of 1 to 1.5 fps have been documented for Bonneville cutthroat trout that varied in standard length between 40–70 millimeters (1.5-2.75 inches) (Aedo et al. 2009). Most young-of-year Bonneville cutthroat trout should be able to swim against currents in front of the project intake and potentially escape via burst swimming. Juvenile bluehead suckers have been found to have relatively good swimming ability as well. Ward et al. (2003) determined that bluehead suckers ranging in size from 61–82 millimeters (2.4-3.2 inches) had a mean failure velocity of about 90 cm (3 feet) per second, which was among the highest for all species tested. This suggests that even young-of-year bluehead suckers should be capable of avoiding entrainment based

solely upon swimming ability. During pre-filing studies, fish of a wide range in sizes had been observed swimming in front of the project trash rack and intake. It is highly likely that, with the exception of larval fish, actual involuntary entrainment is rare at the Weber Project. Yet, both young-of- year Bonneville cutthroat trout and suckers may still be vulnerable to entrainment from behavioral downstream movement.

Turbine Mortality

Fish that enter the project intake would experience injury or mortality passing through the project Francis turbine. The designed operating flows for the project turbine minimizes hydraulic impacts on fish from shear, turbulence and cavitation. Correspondingly, potential fish mortality due to such effects should be minimized for the size of fishes with the highest entrainment potential (fish ≤8 inches). Net head associated with the project is relatively high at 185 feet; however, intake depth is shallow and the pipeline is almost two miles long, thus reducing the adverse effect of head (Franke et al. 1997). These conditions are not conducive to pressure change effects and no pressure-associated injuries were observed during the turbine mortality study. As a result, potential cavitation, turbulence, shear, and pressure effects should be relatively low, or in some cases nonexistent. Under these conditions, turbine mortality should be due primarily to blade strike.

One factor that may influence survival is the relatively high number of blades (34) at the Weber Project compared to those from other studies (13-17). The project Francis turbine is a double-runner design, with 17 blades per side. Double-runner Francis turbines may be used to generate additional speed at sites where head is too low for one runner (Gordon 2003). No test results for double-runner Francis turbines were identified in the literature. Based on field tests, Franke et al. (1997) considered the number of blades to affect survival of intermediate sized fish (150 millimeters), with an increase in blades from 13 to 25 potentially reducing survival from about 95 percent to 90 percent.

Fish survival through the project turbine is relatively lower than fish survival in other studies of fish passage through Francis turbines at other hydroelectric projects (Amaral 2001; Normandeau Associates 2012) and summarized (Eicher et al. 1987; EPRI 1992; FERC 1995; Franke et al. 1997). Project-specific turbine mortality studies revealed that survival for larger-sized trout (average length 285 millimeters) was relatively low at 15 percent compared to an average rate of 70 percent for comparably sized fish (range 290-420 millimeters) from studies at other sites using Francis turbines (Franke et al. 1997). Survival of intermediate-sized fish (average length 166 millimeters) at the Weber River during the turbine mortality study was estimated at 54 percent. Survival of small fish (<100 millimeters) could not be assessed during the turbine mortality study due to the inability to recover surviving fish swimming in the tailrace, although it is noteworthy that both dive teams observed numerous, small (3-

inch test class tiger trout) fish swimming in the tailrace and the river below, apparently unharmed.

Survival is likely influenced by species and sizes of fish as well as the unique physical characteristics of the project. Fish size may be the single most important of these. Entrained fish at the project are expected to be smaller fish that would likely experience better turbine passage survival.

Fish entrainment and turbine mortality would remain at or lower than current levels as the proposed fish ladder would provide an additional route for downstream movement of fish in the project reach of the Weber River. Overall, entrainment and mortality potential of Bonneville cutthroat and bluehead sucker appears to be relatively low for the Weber Project. With construction of the fish ladder and modification of the existing ice chute as attraction flow coupled with spill, which can occur more often during the higher flow periods, there are several avenues for fish to move downstream without having to go through the turbines. This, along with the relatively low water approach velocity upstream of the project intake and the existing trash rack spacing would reduce the potential for fish entrainment and turbine mortality.

Cumulative Effects

Over time, the Weber Project, in combination with other dams, hydroelectric projects, and irrigation diversions on the Weber River and its tributaries, have adversely affected fish populations by impounding riverine habitat, reducing instream flows in bypassed reaches, impeding or disrupting sediment transport and woody debris, fragmenting aquatic habitat, blocking access to historical spawning habitat, and causing mortality of downstream migrants that pass through turbines and into unscreened irrigation canals within the geographic scope (i.e., 43-mile-reach of the Weber River from BOR's Echo Dam downstream to the confluence with the Ogden River).

For fisheries and aquatic resources, the Weber River Basin downstream of Echo Reservoir has been identified as the geographic scope of the cumulative effects analysis. This area was chosen because habitat for fish species is available across this river system and fish species movements occur throughout the system.

The Weber Project is one of two hydroelectric projects where water is impounded on the Weber River; the other licensed project is Bountiful City Light and Power Project (FERC No. 3755) located at the BOR's Echo Dam. Two additional hydroelectric and water storage projects are located on other creeks in the upper basin (East Canyon and Lost Creek). Numerous small irrigation diversion dams and other related infrastructure (including the Weber-Provo River Diversion) have altered the hydrologic flow regime of the Weber River and its tributaries. In addition, many of the impoundments and diversions have no or very low minimum flows (PacifiCorp 2016). Further, these

projects have resulted in the conversion of a substantial amount of lotic (river-type) habitats in the basin to lentic (lake-type) habitats, which may have led to higher summer water temperatures and changes in the structure of fish communities. The dams have also impeded sediment and large woody debris transport, as well as fish migration routes which are important elements of fish habitat.

The establishment of some of the reservoirs has provided environmental conditions conducive to non-native macrophyte growth, which in turn may be responsible for occasionally elevated levels of nutrients and decreased levels of dissolved oxygen, particularly in the reservoir impoundments and the lower Weber River. The dams in the Weber River Basin noted above have substantively increased the number of barriers to fish movements in the basin especially during high flow periods. Potential load following operations at the larger storage projects on the Weber River may be causing disruption of fish spawning in shallower reservoir areas and river habitats, erosion along reservoir and riverbanks, and decreased abundance and diversity of macroinvertebrates. Other contributors to adverse effects on aquatic resources in the basin include construction of the I-84 freeway and other roads, introductions of non- native fish species, hybridization with related non-native trout species, some urbanization, pipeline and railroad construction, and historic timber harvest and mining operations.

Relicensing the project would result in the implementation of several proposed and recommended measures that would reduce cumulative adverse effects of the project on aquatic and fish resources in the Weber River. These mitigation measures include improvements to fish passage that would be created by the construction, operation, and maintenance of the fish ladder and improvements in fish passage created by keeping the low-level gate operational when the forebay is dewatered, and continuation of the historic minimum flow (34 to 50 cfs) regime. On the other hand, the operation of project facilities would continue to result in a minor potential for fish entrainment and turbine mortality.

3.3.3 Terrestrial Resources

3.3.3.1 Affected Environment

Botanical Resources

The project is located at approximately 4,600 feet elevation within a steep-walled canyon (Weber Canyon) and situated parallel to major transportation infrastructure including Interstate Highway 84 and railroad tracks as well as existing non-project pipelines and utility lines. Therefore, most project lands and adjacent areas are dominated by developed and un-vegetated areas including the project facilities (e.g., recreation site, powerhouse, asphalt parking area).

PacifiCorp conducted a desktop study to evaluate botanical resources and landcover in the vicinity of the project using geographic information system-based data [Southwest Regional Gap Analysis Project (Lowry et al. 2007)]. The study area within a 1-mile buffer around the project boundary consists of mostly Forest Service lands ranging in elevation from about 4,600 feet to 6,600 feet elevation. Eighteen landcover and vegetation communities were identified in the study area, dominated by Rocky Mountain Gambel Oak-Mixed Montane Shrubland (57.0 percent) and to a lesser extent Rocky Mountain Bigtooth Maple Ravine Woodland (15.4 percent) and Rocky Mountain Montane Mesic Mixed Conifer Forest and Woodland (8.6 percent). The remaining area (19 percent) consists of smaller patches of native vegetation communities, agriculture, and developed landcover types.

The project area[10] consists predominantly of Developed, Medium-High Intensity Land Cover (66.8 percent), with smaller areas of Rocky Mountain Gambel Oak-Mixed Montane Shrubland (16.3 percent), Rocky Mountain Cliff and Canyon (9.4 percent), Inter-Mountain Basins Big Sagebrush Shrubland (3.6 percent), and Invasive Perennial Grassland (3.1 percent). The remaining area consists of other vegetation communities each 0.5 acre or less in size.

Riparian habitat (i.e., Rocky Mountain Lower Montane Riparian Woodland and Shrubland vegetation class) comprises about 95 acres (1.9 percent) within the larger study area and only 0.04 acre in the project area.

Noxious Weeds

Field surveys conducted in August 2015 documented nine noxious weed species within or near the project boundary (SWCA 2017). Eight of the documented weed species are state-listed and one is a Morgan County noxious weed species. Areas of documented weed occurrence are generally in locations of pre-existing disturbance and in areas where PacifiCorp does not have the ability to influence activities on the surface. These areas include the Interstate Highway 84 corridor and the I-84 rest area east of the diversion dam and recreation site. Weed occurrences are typically patchy with 1 to 5 percent density and largely occur outside of the project boundary. Documented noxious weed species are listed below (Table 8) along with information concerning each species' impact classification according to the Utah Noxious Weed Act (Rule R68-9).

[10] PacifiCorp specifies in its APEA that the project area includes the existing project boundary, the project recreation site, penstock, and the Weber River to the far bank of the river opposite the penstock (regardless of which side of the river the penstock is on).

Table 8. Weed species identified during surveys in the project area (SWCA 2017).

Common name	Scientific name	Classification
Spotted knapweed	*Centaurea maculosa*	Class A
Dalmatian toadflax	*Linaria dalmatica*	Class B
Musk thistle	*Carduus nutans*	Class B
Dyer's woad	*Isatis tinctoria*	Class B
Field bindweed	*Convolvulus arvensis*	Class C
Canada thistle	*Cirsium arvense*	Class C
Houndstongue	*Cynoglossum officianale*	Class C
Saltcedar	*Tamarix ramosissima*	Class C
Lesser burdock	*Arctium minus*	Morgan County noxious weed

Special-status Plant Species

Utah angelica (*Angelica wheeleri*) and Wasatch fitweed (also known as Sierra Corydalis) (*Corydalis caseana*) are two Forest Service R4 sensitive plant species that potentially occur in the project area. The federally threatened Ute ladies'-tresses orchid (*Spiranthes diluvialis*) also potentially occurs in the project area and is discussed below in section 3.3.4, *Threatened and Endangered Species*.

Utah Angelica

Utah angelica is endemic to Utah and found in wet riparian areas or in seeps and springs along the Wasatch Front in Cache, Juab, Piute, Salt Lake, Sevier, Tooele, and Utah counties at elevations ranging from 5,000 feet to 11,483 feet (Utah Native Plant Society 2015). This species is a member of the parsley family, grows from 3 to 6 feet tall, and flowers in July and August. Threats to the species are unknown, but likely include habitat modification, removal, or degradation from urban development, stream channelization, water diversions, recreation, and invasion by exotic plants (Utah DNR 2015).

Wasatch Fitweed

Wasatch fitweed (or Sierra Corydalis) is a perennial plant found in mid-montane areas along streams or nearby drainages in Salt Lake, Summit, Utah, Wasatch, and Weber counties at elevations ranging from 7,500 feet to 8,500 feet. Wasatch fitweed flowers from June to August and threats to this species are currently unknown (Utah Native Plant Society 2015).

In August 2015, SWCA Environmental Consultants (SWCA) biologists conducted botanical surveys in the project area for Utah angelica and Wasatch Fitweed during the flowering period for these species. Surveys documented no individual plants or suitable habitat for either species (PacifiCorp 2017).

Wildlife Resources

As discussed above, terrestrial wildlife habitat within and adjacent to project lands is limited due to existing development and transportation infrastructure. The area is highly disturbed due to active transportation infrastructure (e.g. Interstate Highway 84) which likely limits the amount of usable habitat for wildlife on project lands and adjacent areas. However, as described above, the project vicinity includes a variety of potential habitat including sagebrush steppe shrublands, grasslands, oak-maple woodlands, pinyon-juniper woodlands, riparian woodlands, mixed coniferous forests, wet meadows, and subalpine forests that support a variety of wildlife and game species.

Mammal species potentially occurring in the project area include, but are not limited to mule deer, moose, elk, mountain lion, serval mesocarnivores, beaver, porcupine, several species of small rodents and bats. Over 300 species of birds occur in the vicinity of the project including several species of waterfowl, grouse, raptors, woodpeckers, hummingbirds, and songbirds.

Special-status Wildlife Species

FWS Birds of Conservation Concern that potentially occur in the vicinity of the project include bald eagle (*Haliaeetus leucocephalus*), golden eagle (*Aquila chrysaetos*), rufous hummingbird (*Selasphorus rufus*), olive-sided flycatcher (*Contopus cooperi*), willow flycatcher (*Empidonax traillii*), Brewer's sparrow (*Spizella breweri*), green-tailed towhee (*Pipilo chlorurus*), and Virginia's warbler (*Vermivora virginiae*). The greater sage-grouse (*Centrocercus urophasianus*) may also occur in the vicinity of the project; however, the project area is not within any sage grouse management areas as identified in the *Conservation Plan for Greater Sage-grouse in Utah* (Utah 2013).

Bald eagle and golden eagle could traverse the general area but are unlikely to nest or frequent project lands. No suitable breeding habitat exists within project lands or adjacent lands for rufous hummingbird or olive-sided flycatcher, though they could occur during migratory periods in spring and fall. Small patches of marginally suitable nesting habitat for willow flycatcher may occur upstream of the project dam in patches of riparian vegetation along the Weber River. Habitats consisting of big sagebrush and other shrubs may provide suitable nesting habitat for Brewer's sparrow and green-tailed towhee. Suitable nesting habitat for Virginia's warbler could occur where steep, shrubby draws or slopes in piñon-juniper and oak woodlands are found in the project area.

Smooth Greensnake

The smooth greensnake (*Opheodrys vernalis*) was listed as a Utah State sensitive species. However, in comments on the draft technical study report, Utah DWR noted that the smooth greensnake has been removed from the list of Species of Greatest Conservation Need in the newest Utah Wildlife Action Plan (Utah DWR 2015a).

The smooth greensnake is found in the Wasatch, Uinta, Abajo, and La Sal Mountains at elevations ranging from 5,499 feet to 8,999 feet preferring moist grassy areas and meadows (Utah DNR 2015). The smooth greensnake is easily identified by its unmarked, bright, satiny green dorsal surface (Redder et al. 2006). The species is active in spring, summer, and fall months and hibernates during the winter. Mating has been observed most often in mid to late summer. Threats to this species include decreasing insect abundance, extreme weather conditions, road mortality, habitat alteration and degradation from livestock grazing and recreation (FWS 2011).

Although no specific survey protocols exist for this species, in August 2015 biologists conducted surveys for smooth greensnake by scrutinizing areas of potential habitat in the project area (PacifiCorp 2017). Surveys did not detect the species. The study report notes that the project area lacks preferred habitat for the smooth greensnake, and none have been reported in the project area (PacifiCorp 2017).

3.3.3.2 Environmental Effects

Ground and vegetation disturbance associated with proposed improvements to project recreation facilities and construction of a fish ladder as well as continued project operations and maintenance have the potential to affect botanical and wildlife resources. Such disturbance could also introduce and spread invasive weed species that can replace and alter native vegetation communities through competition. Disturbance of vegetation communities also has potential implications for wildlife species associated with these habitats.

The proposed fish ladder would be sited uphill and north of the existing diversion dam. PacifiCorp estimates that construction of the fish ladder would result in permanent disturbance of approximately 0.16 acre. PacifiCorp states that almost 100 percent of this space is currently developed, un-vegetated (e.g., area adjacent to the ice chute, sidewalk areas, etc.), or part of the lawn at the recreation area.

Proposed changes to recreation facilities would include construction of a new picnic site and improvements on two existing, user-created recreation trails. The picnic site would involve converting about 140 square feet of existing lawn adjacent to the parking lot at the project recreation area. Trail improvements would involve constructing steps at the existing river access trail at the west end of the recreation site and to improve

pedestrian access on the under-freeway, user-created trail by breaking up large boulders or backfilling areas.

The project includes a 77-foot-long, 46-kV transmission line that connects to the non-project Weber substation. Transmission lines can pose an electrocution and collision hazard to birds (APLIC 2006; APLIC 2012), with most electrocutions associated with lines carrying 69 kV or less because the spacing of hardware is often not large enough to prevent birds from spanning between conductors or between a conductor and a ground (APLIC 2006).

PacifiCorp proposes to continue routine annual, as-needed weed control using herbicides (per manufacturer specifications), manual removal and disposal of weeds, and installation of weed barriers. Noxious weed monitoring would continue to occur on an informal basis via ongoing operator observations of facilities.

Forest Service requires (final 4(e) condition 21) PacifiCorp to implement its proposed measure to minimize the introduction and spread of invasive weed species and complete revegetation and related site reclamation following construction activities, including:

- cleaning construction equipment prior to entering the site and before leaving the site following work activities;
- using weed-free staging areas and prioritizing conducting construction-related activities in weed-free areas, when practicable;
- maintaining stockpiled, un-infested material in a weed-free condition;
- retaining native vegetation and minimizing soil disturbance around the proposed construction area; and
- revegetating any disturbed soil after construction to optimize desirable plant establishment and reduce the potential for weed establishment.

Forest Service final 4(e) condition 21 requires PacifiCorp's proposal to annually consult with the Forest Service to discuss any planned project operation and maintenance activities that could affect wildlife and botanical resources, including the potential spread of weed species, to determine if additional protective measures are necessary. In addition, Forest Service final 4(e) condition 13 further requires that PacifiCorp annually consult with the Forest Service and interested MOA signatories and other stakeholders to discuss potential protection measures for sensitive species as well as planned weed control or pesticide use. Forest Service final 4(e) condition 18 similarly requires that PacifiCorp consult on any issues relating to special-status species and sensitive areas, consistent with the consultation groups described in condition 13.

Utah DWQ also requires (WQC condition 11) that PacifiCorp not use any fill materials which may release noxious weed and/or their seeds into waters of the state.

Our Analysis

In general, project lands and adjacent areas within the Weber Canyon likely provide relatively lower quality habitat for most species due to a long history of disturbance from existing development and human activity. Recreation improvements and fish ladder construction would require minor disturbance in existing developed areas with sparse vegetation. About 0.16 acre immediately adjacent to the dam would be permanently disturbed by construction of the fish ladder, but this site does not provide valuable habitat for wildlife. Ground disturbance around the fish ladder construction area and recreation improvements (i.e., trails, picnic site) would provide opportunities for weed introduction and spread due to earthmoving. Weed propagules attached to construction equipment and tools could be transported and introduced from areas outside the project area.

The measures proposed by PacifiCorp and required by Forest Service and Utah DWQ would control the introduction and spread of weed species by limiting contact with areas of known weed infestation, removing weed propagules that may be on construction equipment before it enters and leaves the site, using weed-free fill materials, and minimize areas of ground disturbance that weeds preferentially colonize. Revegetating disturbed soil after construction and monitoring of revegetation efforts, as proposed, would also reduce the potential for weed establishment, promote desirable plant growth, and ensure revegetation is successful. Furthermore, PacifiCorp's proposal to continue to conduct weed control per historic practices would also limit the introduction and spread of weed species from continued operation of the project.

The project's 77-foot-long transmission line runs east to west, approximately parallel to the Weber River and canyon. Generally, larger-bodied birds are more susceptible to electrocution hazards associated with transmission lines due to larger wings able to span between electrified structures. Larger birds are also less maneuverable and therefore less able to avoid colliding with transmission line structures, particularly when flying at relatively high speeds. Birds in the project area are more likely to traverse the narrow canyon by flying parallel to the river and project transmission line. Also, because the immediate area around the transmission line provides little to no habitat, birds are also more likely to fly above the transmission line to access more suitable habitat found on either slope. Therefore, the project transmission line does not pose a high risk to birds due to its orientation and short length. In addition, PacifiCorp states that no documented cases of avian mortality as a result of the transmission line have been reported.

Except for the proposed construction and minor improvements discussed above, PacifiCorp does not propose to alter project operations, maintenance activities, or perform other project-related activities that could result in ground or vegetation disturbance that would affect botanical or wildlife resources. Except for the fish ladder site, disturbance would be mostly temporary and minor (e.g., trail improvements). In addition, proposed construction and improvements would occur in areas that do not provide valuable wildlife habitat. Utah angelica, Wasatch fitweed, and smooth greensnake were not detected during surveys. In addition, no proposed project activities involving ground- or vegetation-disturbance would disturb, or occur near, potential habitat for any special-status wildlife species listed above.

Although not a specific measure to protect terrestrial resources, the Forest Service final 4(e) conditions requiring that PacifiCorp annually consult with the Forest Service and other interested MOA signatories would serve to identify new special-status species and potential terrestrial resource issues associated with future maintenance or operational activities that may require ground disturbance and prescribe resource protection measures as needed.

Cumulative Effects

The geographic scope of the cumulative effects analysis for terrestrial resources encompasses the Weber River Basin. Regulation of flows by upstream dams and diversions has caused daily and seasonal changes in surface water fluctuations that may have led to shoreline erosion, spread of invasive species, and alteration of shoreline habitats. Other dams and diversions, pipelines, roads, railroads, mines, timber harvest, transmission line right-of-way maintenance, and farming and grazing activities, as well as rural, suburban, urban, commercial, and industrial development have collectively contributed to land clearing/alteration resulting in the loss and alteration of terrestrial habitats and their associated plant and wildlife species. In addition, ongoing disturbance caused by activities, noise, and artificial lighting associated with the construction and maintenance of roads, railroads, and other non-project infrastructure as well as vehicular traffic and recreation activities also likely contributes to the degradation and loss of terrestrial habitats, spread of invasive weed species, displacement of wildlife, direct mortality (e.g., vehicle collisions), and changes to wildlife movements. Although many of these non-project developments have not occurred within the project boundary, they are close enough to impact resources within the project area, particularly impacts associated with Interstate Highway 84 and pipeline development, which are located immediately adjacent to the project.

Implementation of proposed and recommended measures as described above, would limit the introduction and spread of invasive weed species and serve to identify any future project O&M activities that could affect terrestrial species to determine if protective measures would be necessary. Because proposed construction and

improvements to project facilities would be minor and located in existing developed areas, loss of habitat and impacts to terrestrial species are expected to be negligible. Continued operation of the project would result in the persistence of current conditions with respect to terrestrial wildlife resources and is unlikely to result in meaningful additional impacts on terrestrial resources.

3.3.4 Threatened and Endangered Species

3.3.4.1 Affected Environment

Three federally threatened species potentially occur in the vicinity of the project. The Ute ladies'-tresses (*Spiranthes diluvialis*) was identified by PacifiCorp in its license application, and the Canada lynx (*Lynx canadensis*) and yellow-billed cuckoo (*Coccyzus americanus*) were identified in the official species report for the project generated on FWS's ECOS-IPaC website on December 6, 2019.[11] No proposed or candidate species, and no proposed or designated critical habitat were identified in the vicinity of the project.

Ute Ladies'-tresses Orchid

The Ute ladies'-tresses orchid was listed as threatened under the ESA on January 17, 1992. The project area is located within the preferred elevational range (4,298 to 6,998 feet) for the federally threatened Ute ladies'-tresses (orchid) and includes suitable habitat for the species. Suitable habitat includes wet meadows, stream banks, abandoned oxbow meanders, marshes, and raised bogs. It prefers cobbly sand, shingly sand, gravelly sand, or sandy loam soils. The perennial orchid blooms from late July through August with ivory colored flowers arranged in a spike. The species is known to have historically occurred in Weber county, with a single 1887 record of it occurring in wetlands along the lower Weber River near Ogden (Fertig et al. 2005). Known threats to this species include habitat modification and removal, over collection, competition from exotic weeds, and herbicides (Utah DNR 2015).

PacifiCorp identified small patches of suitable habitat for Ute ladies'-tresses along the northern bank of the Weber River west (downstream) of the Weber diversion dam (PacifiCorp 2017). SWCA conducted surveys for Ute ladies'-tresses in compliance with FWS survey protocols for the species (FWS 2011). Surveys were conducted in identified suitable habitat during the flowering period in 2015, 2016, and 2017. No Ute ladies'-tresses were found during surveys.

[11] Filed on December 9, 2019.

Canada Lynx

On March 24, 2000, the contiguous U.S. population of the Canada lynx (*Lynx canadensis*) was listed as threatened under the ESA. Canada lynx prefer montane coniferous forest, particularly boreal forest. Loss and alteration of forest habitat are the primary threat to this species. Because no suitable habitat for the Canada lynx occurs in the vicinity of the project, the Weber Project would have no effect on the species, and no further discussion regarding the species is warranted in this EA.

Yellow-billed Cuckoo

The western U.S. distinct population segment of the yellow-billed cuckoo (*Coccyzus americanus*) (YBCU) was listed as threatened under the ESA on November 3, 2014. Suitable nesting habitat occurs at low to mid-elevations (2,500 to 6,000 feet) and consists of dense, multi-layered patches of riparian vegetation with a closed canopy (citation). Habitat patches are at least 12 acres in extent and 100 meters wide by 100 meters long (FWS 2019b). After the breeding period YBCU migrates to winter in South America and therefore does not overwinter Utah. Because no suitable nesting habitat for the yellow-billed cuckoo occurs in the vicinity of the project, the Weber Project would have no effect on the species, and no further discussion regarding the species is warranted in this EA.

3.3.4.2 Environmental Effects

Forest Service final 4(e) condition 13 requires that PacifiCorp annually consult with the Forest Service as well as interested MOA signatories and stakeholders to discuss potential protection measures for species that are newly listed (or delisted) as threatened, endangered, or sensitive species.

Ute Ladies'-tresses Orchid

Project-related recreation activities could result in the trampling of orchids and habitat disturbance. In additional, ground and vegetation disturbance resulting from proposed construction activities (e.g., fish ladder, recreation user trails), vegetation management including the use of herbicides, and competition from invasive weed species could result in mortality or disturbance of Ute-ladies'-tresses orchids.

As discussed in section 3.3.3, *Terrestrial Resources*, PacifiCorp proposes to continue annual consultation with the Forest Service to discuss project-related activities that could affect botanical resources, which would include federally listed plant species, to determine if protective measures are warranted. PacifiCorp also proposes to implement measures to minimize the introduction and spread of non-native, invasive weed species.

No protective measures related to the Ute ladies'-tresses were recommended by resource agencies or the Forest Service. However, Forest Service final 4(e) condition 21, would require PacifiCorp to implement all of its proposed environmental measures including those discussed above in section 3.3.3.2.

Our Analysis

Identified suitable habitat for the Ute ladies'-tresses is located on the northern bank of the Weber River immediately adjacent to the existing, recreation area. The recreation area provides informal access to the Weber River for fishing and other activities. In order to access a portion of the river, users likely walk across the area where identified suitable habitat is located. If the species is present, recreational use in this area could result in trampling of individual orchids, disturbance to habitat, and increased interspecific competition resulting from the spread invasive weed species.

Proposed recreation improvements to construct steps on the existing dirt river access trail at the west end of the recreation site would occur near, but upslope from identified suitable habitat for the listed orchid species. The proposed fish ladder and other improvements to recreation facilities would not occur near suitable habitat.

However, FWS protocol surveys for Ute ladies'-tresses conducted for three growing seasons (2015, 2016, and 2017) did not detect any individuals of this species. Additionally, records indicate this orchid species has not been documented in Weber or Davis Counties since the 1800's. Further, existing non-project transportation infrastructure (e.g., interstate 84, railroad) and associated ongoing human activity in the project area has impacted the area extensively for decades likely reducing the suitability of potential riparian habitat for this orchid species.

Because it's highly unlikely that the Ute ladies'-tresses is present in the project area we conclude that the relicensing the project would have no effect on the species. Nevertheless, PacifiCorp's proposed measures to control invasive weed species, required by the Forest Service, would minimize impacts to native plant communities including the Ute ladies'-tresses.

3.3.5 Recreation

3.3.5.1 Affected Environment

General Recreational Setting

The project is located within Weber Canyon and is surrounded by Forest Service and UPRC lands. The UWCNF is adjacent to the highly populated and urbanized

Wasatch Front metropolitan region, which stretches from Brigham City, Utah, south to Nephi, Utah and includes the state capital of Salt Lake City. The mouth of Weber Canyon is approximately 8 miles from the city of Ogden, Utah, and 30 miles north of Salt Lake City. The western, or down canyon, edge of the project area is approximately 9 miles from the Ogden city center. Recreation is the dominant land use on surrounding Forest Service land encompassing Weber Canyon, and includes activities such as fishing, camping, hiking, picnicking, biking, snowmobiling, and cross-country and downhill skiing. However, recreation use and access is limited in the immediate vicinity of the project, except for the Utah DOT rest area and the project recreation site, because of physical obstacles to public access such as the I-84 freeway and the UPRC railroad track corridor, and prohibitions to public access, associated with the freeway and railroad corridor. The Utah 2014 State Comprehensive Outdoor Recreation Plan report (Utah DNR 2014) shows current uses, visitor perceptions, and future needs for the Wasatch Front region. This information shows that about half of the Wasatch Front region's population regards outdoor recreation as extremely important, and just over half travel over 25 miles for recreation opportunities.

The primary recreation facility in the vicinity of the project is the State-managed I-84 freeway rest area, located approximately 0.25 mile east from the project's diversion dam. While the rest area is managed by Utah DOT, a privately contracted company maintains it. The rest area primarily provides a place for motorists to stop for resting from driving or to use the restroom facilities, but recreational visitors also use the area for picnicking, angling, and accessing the bypassed reach for whitewater boating (kayaking). The rest area has permanent restrooms, drinking fountains, picnic tables, river access for persons with disabilities, viewpoints, and irrigated landscaping. The rest area, by design, is easily accessed from the east-bound lanes of the I-84 freeway and therefore receives a higher number of visitors compared with the project recreation site. The project recreation site access road begins at a point along the single-lane, I-84 rest area entrance road, just before the rest area parking lot, which requires motorists to execute a relatively sharp right turn and double-back, driving west for approximately 0.25 mile, to reach the recreation site parking lot. Utah DOT maintains another freeway rest area approximately 2 miles east of the project. The Forest Service has no developed recreation sites in the vicinity.

Dispersed, non-project recreational activities, such as target shooting, occur in an area downstream of the project recreation site, adjacent to Horseshoe Bend, on the old I-84 highway roadbed. This area is outside of the Weber project boundary, and is located on land owned partially by UPR and partially by the USFS; however, the main point of access to this location is by an approximately 300-foot-long user-created, pedestrian trail that leads from the terminus of the project recreation site asphalt path, under the I-84 freeway overpass, and eventually intersects with the old highway roadbed. Anglers, walkers, and whitewater boaters also utilize this user-created trail to access the bypassed reach.

Project Recreation site

The project recreation site is located on UWCNF land administered by the Forest Service, and operated by PacifiCorp within the project boundary, immediately downstream from the Weber diversion dam. The project recreation site is a day-use facility and includes a parking area and asphalt path, picnic tables, an open grass area, fishing access to the bypassed reach, a fishing platform on the north bank of the forebay with a table that is accessible to persons with disabilities, a portable toilet that is available on a seasonal basis, a dumpster, and an interpretive display. The current condition of the existing amenities provided at the project recreation site are detailed in Table 9. In addition, Figure 5 provides a visual representation of existing recreation amenities.

Table 9. Existing recreation amenities at the project recreation site and their current condition (Source: PacifiCorp, 2018a, as modified by staff).

Recreation Amenity Type	**Recreation Amenity Description**	**Recreation Amenity Current Condition**
Parking Area	Parking for approximately 12 vehicles	Parking area needs resurfacing
Seasonal Portable Toilet	1 seasonal portable toilet	Seasonal toilet receives sufficient maintenance to accommodate use levels
Dumpster	Dumpster suitable for use by recreationists at the site	Dumpster receives sufficient service to remain at or below capacity; small pieces of scattered trash in varying concentrations throughout the recreation site and along the river, both upstream and downstream of the dam, along the river corridor, and beneath the overpass
Picnic Area	4 picnic tables, 4 grills, and one asphalt path which leads to one table and grill	Picnic tables and grills are in good condition; picnic table nearest the parking lot is not fully accessible to persons with disabilities because the asphalt path leading to it is above the acceptable grade and it is cracked and buckled by tree roots
Interpretive Display	Information on project management, rules, and fishing	Display panel includes required FERC Part 8 regulations and fisheries information but is generally lacking in interpretive information about the site, contains some information about Bonneville cutthroat trout and bluehead sucker; is in need of fresh paint
Fishing Platform	Fishing platform at forebay, with 1 table which are accessible to persons with disabilities	Fishing platform is in good condition; railing is in need of fresh paint; conforms to standards for access by persons with disabilities

Recreation Amenity Type	Recreation Amenity Description	Recreation Amenity Current Condition
Informal Access to Bypassed Reach	Narrow unpaved trail from asphalt path to north bank of the Weber River	Trail not developed or maintained as part of the formal recreation site; Informal trail created by repeated use; within the project boundary
Asphalt Path	Asphalt path down the side of the grass area	Asphalt path is cracked and buckled due to tree roots and is overhung by branches in places (as a result it is not fully accessible to persons with disabilities); chain link fence on the south side of the asphalt path has numerous patches from visitors cutting holes in the fence, presumably for fishing access downstream of the dam; portions of the barbed wire along the top of this fence are damaged or missing
Informal Use Area	Open grass area	Grass is well cared for and in good condition; protective shields around the trees, to prevent damage by beavers, are often damaged or missing
Active Recreation Area	Former sandbox play area	Former sandbox area has become overgrown with vegetation and the fence surrounding the area is damaged

Figure 5. Existing recreation amenities at the Weber project recreation site. (Source: PacifiCorp, 2018a, as modified by staff).

The primary point of public access to the project recreation site, and bypassed reach of the Weber River, is from the Weber Canyon I-84 freeway. Recreationists wishing to access the project recreation site and bypassed reach take a right-hand turn from the rest area entrance road, and follow an approximately 1,000-foot-long, 10-to-20-foot-wide asphalt-paved access road to the recreation site parking area. From the parking area, the access through the recreation site picnic area and open grass area is along an asphalt path. At the terminus of the asphalt path, a short user-created trail, within the project boundary, provides access to the north river bank of the bypassed reach for angling and whitewater put-in. Additionally, beyond the asphalt path and project boundary, a user-created informal river access trail leads visitors further downstream, along the bypassed reach, under the I-84 freeway overpass, and eventually intersects with the old highway roadbed. Recreational opportunities such as angling, whitewater put-in, and walking occur along this portion of trail and old roadbed, while target-shooting, unrelated to the project, occurs further down the roadbed. Several vehicle pull-off locations exist along the I-84 freeway that serve as additional non-project access points to the bypassed reach.

Current maintenance conducted by project personnel at the recreation site includes grass mowing and edging, lawn watering, sprinkler maintenance and repair, tree branch removal, trash cleanup, and repair of vandalism. These tasks are conducted on an as needed basis, as determined by project personnel, while trash removal from the dumpster and servicing the seasonal portable toilet are provided through contracts with outside companies.

Visitor Use

Recreation Use

Table 10 provides a summary of visitor use estimates based on the Recreation Use and Demand Study visitor use survey. In 2016, the estimated total project recreation use was 3,754 recreation visits per year.[12] Visitor-days per year were estimated to be between 605 and 1,248 days.[13] The project recreation site averaged 12 recreation visits per day on weekends, and 9.6 recreation visits per day on weekdays. Seventy-nine percent of the visitor use survey respondents indicated they recreated or were going to recreate at the site for a "short trip" (1-3 hours), 15% responded they were recreating for "about half the day" (4-6 hours), and only 6% responded they were recreating for "the majority of the day" (8-12 hours). Site occupancy is presented in Table 10 as maximum

[12] A recreation visit is defined as a visit by one person to a recreation area for any portion of a single day.

[13] A visitor-day is defined as 12 hours of use by any combination of users to a recreation area.

occupancy observed at recreation area facilities over the course of the surveys. Neither parking nor tables were ever observed to be approaching capacity with maximum parking occupancy at approximately 50 percent (based on a lot capacity of 12 vehicles) and maximum table occupancy at 20 percent (one of five occupied).

Several key use characteristics of the project recreation site reported by the visitor use survey results include:

- Eighty-six percent of visitors indicated that they reside in Weber, Davis, or Morgan counties.
- Ninety-four percent of visitors indicated that they would be recreating at the site for 6 or less hours.
- Seventy-six percent of visitors indicated that they had visited the site more than 10 times.
- Seventy-four percent of visitors indicated that they had recreated on the user-created informal river access trail leading west from the project recreation site.

A heat- and motion-triggered trail camera (Reconyx HC600), installed in a position to view the informal river access trail extending west from the project recreation site toward the I-84 freeway overpass, operated continuously from March 11, 2016 through September 13, 2016 as part of the Recreation Use and Demand Study; however, from May 28, 2016 to June 28, 2016 the camera was obscured by growing vegetation and no data were collected. Following the period when no data were collected, to ensure the trail camera would no longer be obscured, it was moved to an elevated position where vegetation could not obstruct the camera's view of the trail. Based on the increasing trend of trail use from March through May, and the generally declining trend of trail use from July through September, the missing period of June was likely the highest use period of the non-project, user-created trail. Therefore, results of the trail camera survey may underestimate overall use, although the breakdown by type of recreation is not likely affected. Individual trail users were only counted once per trip on the trail (i.e. out and back), and each member of a party was counted individually. Users were categorized into use types by their attire and distinguishable gear or equipment they carried. In cases where it was unclear what use-type to assign, walking was assigned as the default category.

Table 10. Recreation use metric estimates for the Weber recreation site (Source: PacifiCorp, 2018a, as modified by staff).

Estimated Recreation Visits per Year	3,754
Estimated Recreation Visitor-Days per Year	605 – 1,248

Estimated Recreation Visits per Year	3,754
Percentage of Sites Occupied (maximum observed)	
Parking (approximately 12 spaces available)	50%
Picnic Tables (5 total – 4 in open grass area, 1 at fishing platform)	20%

Fishing is the main recreational use of the project area based primarily on trail camera results, 2016 recreation visitor use survey data, and UDWR creel census data (Cirrus, 2017). Of the 1,001 total users counted with the trail camera from March to September 2016, over half (61%, or 617 users) participated in fishing. Fishing use in the project area tends to dominate particularly within the June to September timeframe with less fishing use as a percentage of all recreational use in the period from March through May. Walking and target shooting are also common recreational activities in the area as recorded in the trail camera user count results. Less common uses of the area recorded by the trail camera include photography, whitewater boating (kayaking), and prospecting. Recreational users by user type and month are recorded in Table 11.

Table 11. Non-project user-created informal river access trail users by use type based on data from remote camera (Source: PacifiCorp, 2018a, as modified by staff).

Time	**Use Type**	**Percentage**	**n.**
March (March 11-31)	Fishing	44	31
	Walking	42	29
	Shooting	11	8
	Photography	1	1
	Kayaking	0	0
	Prospecting	1	1
April	Fishing	54	86
	Walking	34	54
	Shooting	11	17
	Photography	1	2
	Kayaking	0	0
	Prospecting	0	0
May	Fishing	54	100
	Walking	31	57
	Shooting	9	16
	Photography	3	6

Time	Use Type	Percentage	n.
	Kayaking	3	5
	Prospecting	0	0
June	Fishing	79	26
	Walking	12	4
	Shooting	9	3
	Photography	0	0
	Kayaking	0	0
	Prospecting	0	0
July	Fishing	73	200
	Walking	12	53
	Shooting	14	51
	Photography	1	2
	Kayaking	0	0
	Prospecting	0	0
August	Fishing	68	124
	Walking	20	37
	Shooting	12	22
	Photography	0	0
	Kayaking	0	0
	Prospecting	0	0
September	Fishing	76	50
	Walking	22	15
	Shooting	2	1
	Photography	0	0
	Kayaking	0	0
	Prospecting	0	0
Total	Fishing	61	617
	Walking	25	249
	Shooting	12	118
	Photography	1	11
	Kayaking	<1%	5
	Prospecting	<1%	1

Future Recreation Use

In the next 10 to 20 years, visitor expectations regarding the types of recreational experiences available in the project area are not expected to change substantially. The site characteristics that currently limit recreational access and opportunities are generally not subject to change (e.g. I-84 freeway alignment and access prohibitions). Day use would continue at the project recreation site by solitary local fishermen and walkers, and whitewater boaters would continue to recreate in the bypassed reach when boatable flows would be present. State of Utah population estimates project statewide population growth of 44 percent over the next 20 years, and it is expected that use of the project recreation site would increase proportionally.

Visitor Needs

PacifiCorp's Recreation Use and Demand Study survey responses provided project recreation site users' perspectives regarding the adequacy of project recreation facilities and unmet demand for recreation opportunities at the project. Survey respondents and stakeholders who took part in the survey and relicensing process identified the following as potential needs/improvements:

- Improving the user-created river access trail, outside of the project boundary, that leads west from project recreation site
- Improving in-river fish habitat
- Improving the informal, non-project target shooting area downstream of the project recreation site
- Replacing the chain link fence restricting access downstream of the diversion dam.
- Improving the signage at the recreation site.
- Improving the recreation site turn-off from the I-84 freeway off-ramp and the road from the turn-off to the picnic area because of potholes and a lack of signage, and delineating parking spots in the recreation site parking area.
- Improving waste collection.
- Installing a permanent toilet
- Removing the fence around the sandy area at the west end of the picnic area and improving river access at this location.
- Exploring the potential to suspend generation to allow for whitewater flow releases.

- Painting the fishing platform handrail
- Securing and installing adequate protective tree "sleeves"
- Improving access to river flow information for whitewater boaters and anglers

Whitewater Boating

The Weber River offers one of the closest whitewater boating opportunities for Wasatch Front-based whitewater boaters. Whitewater boating in the approximately 1.9-mile-long bypassed reach typically occurs during the spring months, corresponding with the melting of the lower-elevation snowpack. Results from PacifiCorp's Whitewater Recreation Study indicate that optimum whitewater boating flows in the bypassed reach occur between 600 and 1,200 cfs,[14] with the minimum acceptable boating flow being 450 cfs.[15] The minimum acceptable flow reported by the whitewater study's focus group participants ranged from 300 to 700 cfs, while the range for optimum flows was 700 to 1,200 cfs. Participants of the whitewater study internet survey were asked to rate the acceptability of a range of flows, from 200 to 1,000 cfs, in the bypassed reach, and rated 900 cfs as the most acceptable flow. Results from the internet study indicated that flows less than 400 cfs were unacceptable, but as flows increased above 400 cfs the acceptability ratings varied more broadly. The majority of participants of the whitewater study's internet survey rated the whitewater difficulty for the project bypassed reach of the Weber River as Class IV;[16] although, focus group participants tended to rate the difficulty of individual sections differently. Certain individuals in the focus group, who were more familiar with the bypassed reach and possessed a higher level of boating skills compared to individuals with less experience, tended to assign a lower difficulty rating to the reach. Although, collectively, the focus group participants agreed that the overall rating for the bypassed reach is Class IV, reflecting the difficulty of the Horseshoe Bend and Triple Drop rapids.

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[14] Internet survey participants identified an optimum flow range from 600 – 1000 cfs, whereas the optimum flows for focus group participants ranged from 700 to 1,200 cfs.

[15] Internet survey participants identified 450 cfs as the minimum acceptable flow, whereas the minimum acceptable flow for focus group participants ranged from 300 to 700 cfs. PacifiCorp calculated a minimum acceptable boating flow of 450 cfs for the bypassed reach from the internet survey and focus group discussion results; although, a minority of focus group attendees reported previously boating certain rapids in the bypassed reach at flows lower than 450 cfs.

[16] The International Scale of River Difficulty is a rating system used to compare rivers around the world. It uses a class I (easy) to class VI (expert) ranking depending upon the difficulty of the rapids on the river.

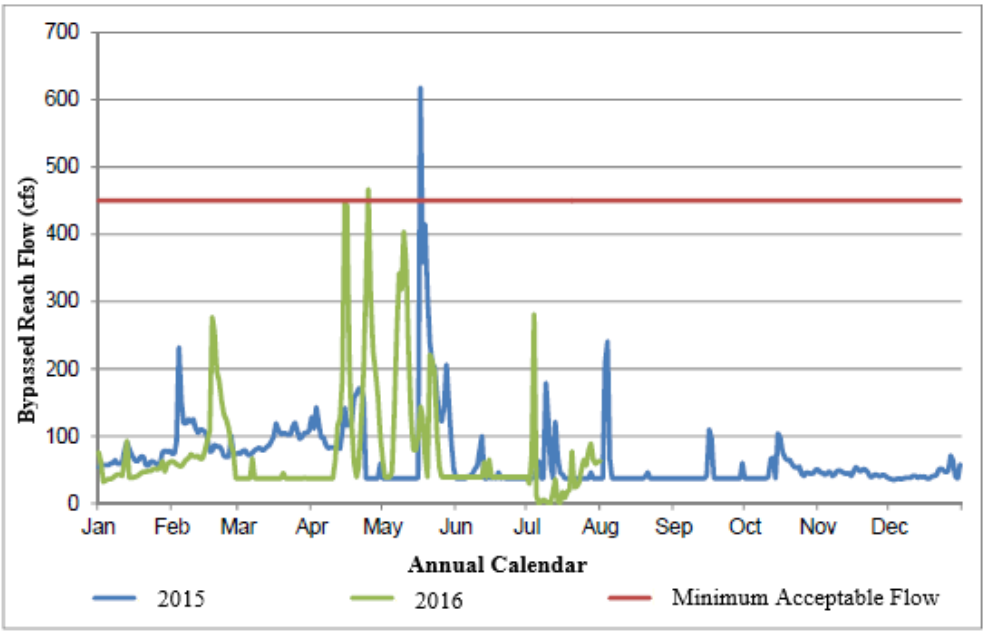

Figure 6. Mean daily flows in the project bypassed reach during relicensing Whitewater Boating Use Study. (Source: Whitewater Recreation Study Technical Report. Prepared by ERM-West, Inc. 2016, contained as Appendix C in Cirrus 2017, as modified by staff).

The project operated for 176 days in 2015, and 217 days in 2016 through September 30, 2016, which coincided with the completion of PacifiCorp's whitewater study. Mean daily flows between 450 and 750 cfs at the Gateway gage occurred on 13 days in 2015, and on 26 days 2016; however, 300 cfs was diverted for power generation, which resulted in 39 less days of acceptable boatable flows (Table 12). Flows greater than 750 cfs at the Gateway gage resulted in discharge to the bypassed reach, sufficient for whitewater boating, when 300 cfs was diverted to the project for generation; although, mean daily flows at the Gateway gage exceeded 750 cfs on only 1 day in 2015, and on 2 days in 2016. Figure 6 shows these three events, when flows at the Gateway gage exceeded 750 cfs, as three peaks where mean daily flow in the project bypassed reach met, or exceeded, 450 cfs. Figure 6 also indicates the majority of mean daily flows in the bypassed reach fell short of exceeding 300 cfs, the lowest of the minimum acceptable flows indicated by study results. During periods of project operation, flows greater than 750 cfs measured at Gateway gage are necessary for the bypassed reach to have at least 450 cfs flow, and thus a whitewater opportunity, without reduction of generation.

Table 12. Number of Days with Whitewater Boating Opportunities in the Project Bypassed Reach. (Source: Whitewater Recreation Study Technical Report. Prepared by ERM-West, Inc. 2016, contained as Appendix C in Cirrus 2017, as modified by staff)

Project Operations	Number of Days		Flow at Gateway Gage	Number of Days		Acceptable Boatable Flows Present (Yes/No)
	2015	2016 (through Sept. 30)		2015	2016 (through Sept. 30)	
Project Offline	189	57	< 450 cfs	0	0	No
Project Operating	176	217	450-750 cfs	13	26	No
Project Operating			> 750 cfs	1	2	Yes

Whitewater boaters rated the approximately 0.25-mile "Pipe" Area section of the project bypassed reach, between the I-84 freeway bridge, downstream of the project recreation site and the top of Horseshoe Bend, as Class II. Whitewater boaters are mostly attracted to an approximately 0.3-mile-long section, after the "Pipe" Area, called Horseshoe Bend (or, Scrambled Eggs) which can provide Class III to Class IV boating opportunities when discharge at the USGS Gateway gage exceeds the Weber diversion dam capacity, but boaters also reported that this section can provide a technical boating experience at flows as low as 140 cfs. Boaters launch on the project bypassed reach a short distance from the project recreation site, at the end of the two user-created trails (one within the project boundary, and one outside the project boundary) that diverge from the western end of the recreation site's paved asphalt path. After boating the Horseshoe Bend section of the bypassed reach using the informal put-ins close to the recreation site, boaters must either carry their boats back upstream along Utah DOT's old highway roadbed and back to the put-ins, or continue downstream through the Triple Drop and Hell or High Water sections of the bypassed reach, followed by a portage of the non-project DWCCC diversion dam, approximately 0.75 mile downstream of the project powerhouse.

Triple Drop, immediately downstream of Horseshoe Bend, consists of three ledge drops in succession, each considered Class IV, or Class III if flows are closer to 200 cfs. Hell or High Water, the 1.2-mile Class III section between the base of Triple Drop and the Weber Powerhouse, has no defined rapids. Whitewater study participants commented this section can have Class IV opportunities at flows greater than 1,500 cfs; however, participants stated this section is less appealing during flows less than 1,500 cfs. The majority of boaters take out on South Weber Drive, downstream of the DWCCC diversion dam; however, it is not preferred because it requires paddling the 1.2-mile Class II-III section, Hell or High Water, portaging around the DWCCC dam, and paddling another 0.75-mile Class II section that may be severely dewatered by DWCCC

irrigation flow diversions. Alternative locations for boating put-in and take-out are limited because access to the Weber River from the I-84 freeway shoulder, and old highway roadbed, is prohibited by Utah DOT. No commercial whitewater outfitters operate within the bypassed reach of the Weber River.

The 1.2-mile Hell or High Water section below Triple Drop, and the 0.75-mile section downstream of the DWCCC diversion dam, require higher minimum acceptable and optimum flows than Horseshoe Bend. Whitewater study participants commented that Hell of High Water can have fun Class IV- play water at flows greater than 1,500 cfs; however, at flow levels less than 1,500 cfs, participants also commented that the section is less appealing. Prior to the restrictions on river access from the I-84 freeway, most boaters did not paddle below Triple Drop. Similarly, most boaters previously avoided the 0.25 mile section upstream of Horseshoe Bend, electing instead to put-in at the start of the Horseshoe Bend section. As mentioned above, Horseshoe Bend can offer a technical boating opportunity at flows as low as 140 cfs; although, the current access limitations make it more difficult for boaters to take advantage of these technical boating opportunities due to the requirements to paddle the other less desirable sections of the river to reach the take-out location.

Historically, when river access was permitted from the shoulder or median pull-offs of the I-84 freeway, minimum acceptable flows were less; however, now that access from I-84 is currently prohibited, boaters indicate that higher flows are necessary to navigate the Triple Drop and Hell or High Water sections, thus leading to an increase in boaters' minimum acceptable flow for these sections. Boaters with a tolerance for lower minimum acceptable flows tend to live in closer proximity to the project, while boaters traveling longer distances preferred a higher range of flows. Whitewater study participants reported flows of 300 cfs are now necessary to boat Triple Drop and Hell or High Water, Ogden boaters indicated they preferred flows closer to 400 cfs, and boaters traveling a further distance to boat these sections required an even higher minimum flow. Participants also indicated that flow preferences for the project bypassed reach are influenced by competing boating opportunities. Whitewater study participants indicated that in years with below-normal precipitation, flow preferences decreased due to the limited number of whitewater boating opportunities locally and regionally. Whitewater study participants also indicated that the threshold for minimum acceptable flows and optimum flows is now higher because of the limitations to access on the bypassed reach that require boaters to paddle more of the reach than only the preferred whitewater rapids on the Horseshoe Bend section.

Although the trail camera user counts (Table 11) recorded less than 1 percent of users engaged in whitewater boating (kayaking), the results likely under-reported whitewater boating use of the bypassed reach because whitewater boating trips that were not captured by the trail camera were recorded during the whitewater boating study. Internet survey participants reported making 22 trips to the bypassed reach between

March 2015 and September 2015; most trips occurred in May and June. Internet survey respondents reported making 11 trips in 2016 during the March through September time-period; most trips occurred in April, and a single trip was indicated as occurring in late June. In general, whitewater study internet survey participants indicated they made fewer than five trips to the project bypassed reach during the previous 12 months (i.e., 2014-2015). Fifteen participants indicated they had not paddled the bypassed reach in the previous 12 months, whereas 24 respondents indicated making one to five trips in the previous 12 months. Two participants indicated making 6- to 10 trips or 11- to 20 trips, respectively, during the past 12 months. No participants reported making more than 20 trips during the past 12 months. When asked the total number of total trips they made to the bypassed reach for whitewater recreation over time, 17 internet survey participants indicated they had made 1- to 5 trips, 12 participants indicated a total of 11- to 20 trips, and 11 participants indicated they had made more than 20 trips.

Weekends and weekdays after work hours (typically 5 p.m.) were preferred for trips to the project bypassed reach. Internet survey participants compared the bypassed reach to local, state, and regional whitewater opportunities using a five-point rating scale ranging from worse than average to among the very best. The whitewater opportunities used in the comparison included the Weber River Whitewater Play Park, rivers within a one-hour drive, other rivers in Utah/Idaho/Wyoming, and other rivers in the United States. Most internet survey respondents rated the project bypassed reach worse than average compared to the other whitewater boating opportunities within a one-hour drive; however, our survey respondents identified the bypassed reach as among the very best within a one-hour drive. Focus group participants indicated there are equal or better whitewater boating opportunities within a 1-hour drive from the project bypassed reach. These opportunities can be found on the Ogden, Bear, Upper Logan, and Malad Rivers, and at the Weber River Whitewater Play Park. In general, the unfavorable rating of the project bypassed reach increased as the geographic radius of the comparison expanded (i.e., other rivers in Utah/Idaho/Wyoming, and other rivers in the United States).

3.3.5.2 Environmental Effects

Effects of Construction-related Activities

PacifiCorp proposes to: (1) construct a fish ladder structure at the existing project diversion dam; (2) make improvements to the existing project recreation site that include constructing a year-round permanent vault toilet accessible to persons with disabilities, installing interpretive signage, constructing a new picnic site (or modifying an existing picnic site) accessible to persons with disabilities, repaving the access road and asphalt path, removing portions of fencing around a former play area, and improving access on a dirt river access trail; and (3) improving the user-created informal river access trail leading to the bypassed reach, west of the project recreation site, through an off-license

agreement. This section provides a general description of the effects of the construction of these facilities on recreation resources.

Fish ladder

PacifiCorp proposes to construct the fish ladder, immediately adjacent to the existing non-operative fish ladder/ice chute, at the project diversion dam. The fish ladder would also be situated alongside the existing project recreation site parking area. PacifiCorp proposes to use the project recreation site during staging and construction of the fish ladder and anticipates that the site would be closed to recreation use, and as a means of access to the bypassed reach immediately downstream of the recreation site, for the full duration of the construction period. The total area of disturbance (approximately 0.16 acre) for construction of the fish ladder would include the footprint of the fish ladder and approximately 10 feet to the north and west of the fish ladder footprint where construction and staging activities would occur. PacifiCorp states that warm weather and low flows within the Weber River are ideal work conditions for fish ladder construction, and that while those conditions are targeted for the timing of fish ladder construction, the duration of construction activities would require work outside of the ideal timeframe resulting in an approximate April to December construction period. PacifiCorp expects construction to be completed in approximately 9 months, including during the lowest flow portion of the year – October through December.

Our Analysis

Fish ladder construction would have a short-term, but major effect on project recreational opportunities. PacifiCorp anticipates that construction would result in an approximately 9-month closure of the project recreation site and loss of access to the bypassed reach, from the project recreation site, immediately downstream of the site. PacifiCorp anticipates construction equipment requirements to consist of one to two trackhoes, one to two concrete trucks or concrete pumper trucks, one to two skid-steer loaders, and possibly a crane. Although PacifiCorp did not describe construction crews' accessing the site, it can be assumed that workers would arrive in the morning and depart in the evening, daily, on weekdays; certain construction vehicles, including concrete trucks and concrete pumper trucks, would arrive at the site daily during scheduled concrete pours; and other construction vehicles including skid-steer loaders and a crane likely would be temporarily staged at the site. To ensure the safety of project recreation site visitors, and construction workers, visitors would be prohibited from entering and using the recreation site, including accessing the bypassed reach of the river from the site, for the duration of the anticipated 9-month period of construction. As such, the effect on recreation access and use of the project recreation facility, and access to the bypassed reach would be noticeable, but short-term.

PacifiCorp would utilize much of the existing recreation site parking area and access road for transportation to and from the construction site, movement of construction materials, and parking for construction vehicles. Although certain construction activities could require a temporary closure of access to all project recreation site facilities during the regular course of a construction day, it is not clear whether the proposed construction work would occur on weekends and/or holidays, when the majority of recreation site visits occur. If construction is not to occur on weekends and/or holidays it is unclear why PacifiCorp expects a 9-month prohibition on recreation site access. Providing a safe and secure route to the recreation site facilities unaffected by construction activities, through the use of physical man-made barriers, could be a means for providing continued visitor access to these facilities.

Developing the upstream fish passage plan, as discussed in section 3.3.2.2, that includes provisions for keeping the recreation site open to pedestrian-only access to the extent practicable and for coordination with Utah DOT related to construction vehicle traffic, during construction of the fish ladder, would minimize and mitigate construction-related effects on project recreational resources. In order to minimize the severity of a total closure of the project recreation site for the duration of the fish ladder construction, any plan should include strategies to isolate active construction areas in order to prevent construction encroachment on areas not directly impacted by construction and prevent the public from accessing the construction area. To the extent that the recreation site parking area could be closed entirely to non-construction use any plan should include considerations for alternative parking for recreation site visitors during the period of construction. Any plan should also include communication protocols for providing a schedule of proposed construction-related activities to resource agencies and Utah DOT, including activities related to transporting heavy equipment and construction materials, which may impede motorists' safe and efficient access to the Weber recreation site and the I-84 rest area parking lot and facilities.

Project Recreation Site Improvements and Plan

To enhance recreational opportunities at the project, PacifiCorp proposes to construct a year-round permanent vault toilet accessible to persons with disabilities, install signage instructing visitors on proper dog waste disposal, coordinate with the Forest Service, Utah DWR, Trout Unlimited, Utah DWQ, FWS, and American Whitewater to develop improved interpretive signage (which could also include a scan-able code that links to real-time bypassed reach flow information), construct a new picnic site (or modify an existing picnic site) accessible to persons with disabilities, maintain/repave the access road and asphalt path, remove portions of fencing around the former sandbox play area, and construct approximately 18 feet of steps, approximately 2 to 3 feet wide, on an informal dirt river access trail within the project boundary.

Although it is not a recreational element of the project recreation site, or a project facility within the project boundary, PacifiCorp proposes to provide funds, for an off-license agreement with Trout Unlimited, to improve the user-created informal river access trail leading to the project bypassed reach from the west end of the project recreation site. Improvements would involve breaking up the existing large-boulder surface, or backfilling the surface, to create a navigable path of minimal width, consisting of smaller rock and natural surface. PacifiCorp also proposes that funds provided for the off-license agreement could be used by Trout Unlimited to provide another habitat benefit in the watershed if improving the trail is not feasible or requires less funding than provided for improving the trail.

Our Analysis

Continued maintenance of the existing recreation site would facilitate the ongoing use of the recreation site as described in section 3.3.5.1. The proposed measures for recreation site improvements and signage would enhance visitor satisfaction, improve accessibility of important recreational amenities, improve recreation site picnic area aesthetics, improve availability of bypassed reach flow information, and make it easier for visitors to safely access the bypassed reach for fishing, walking, whitewater boating, and other river-related recreational activities. Constructing steps on the dirt river access trail would make it safer and easier for anglers and boaters to access the bypassed reach shoreline for fishing and for whitewater put-in, respectively. The presence of the steps along this trail would ultimately reduce the potential for soil erosion as a result of continued recreational use, because the steps would control erosion by effectively shielding a portion of the bare-earth trail from exposure to weather (i.e. rain, snow, and runoff) and continued recreational use. Installing a year-round permanent vault toilet, accessible to persons with disabilities, would improve visitor satisfaction by addressing current needs and increased use of the recreation site in the future. Also, the presence of a year-round permanent vault toilet would improve the recreational experience at the site during the off-season months. Currently, the temporary portable toilet is not provided at the site during the off-season; rather, visitors must use the toilet facilities at the I-84 rest area, approximately 0.25-mile upstream of the project recreation site.

Creating a new picnic site, accessible to persons with disabilities, or modifying an existing picnic site to achieve this goal, would make a picnic site available within the open grass area of the recreation site where currently the only picnic sites that exist are not accessible to persons with disabilities. The project's only picnic table that is accessible to persons with disabilities is located at the fishing platform approximately 300 feet from the open grass area.

Reconfiguration of fencing on the west end of the recreation site to remove the south, east, and west portions of the fence around the former sandbox play area would improve the visual quality of the picnic area for visitors. Maintaining and repaving the

access road to the recreation site and the asphalt path in the picnic area would improve the visitor experience by creating a more even and continuous surface for driving to the site as well as creating an even surface for walking in the picnic area either for purposes of picnicking or river access. Installing new interpretive signage or updating existing signage to inform recreation site visitors about the proper disposal protocols for dog and pet waste disposal would benefit all recreation site users by ensuring pet waste is properly disposed, thus keeping the recreation site clean and free of potential hazards to public health. Including information, or links to information, regarding river flows on the improved interpretive signage would help to inform all bypassed reach users of river conditions.

PacifiCorp's proposal to improve pedestrian river access by providing $30,000 for an off-license agreement with Trout Unlimited, to improve the user-created informal river access trail leading west from the project recreation site to the bypassed reach, would improve the recreational experience and safety of visitors using this trail and enhance recreational access to the project bypassed reach. Providing safe, reliable, and easily traversable pedestrian access to the bypassed reach in this location would improve access to recreational opportunities, such as fishing and whitewater boating, which are directly affected by project flows. As discussed in Section 3.3.5.1, the trail camera data showed that 1,001 visitors used this trail to access the bypassed reach for recreation, including for fishing, walking, and whitewater boating. Additionally, 74-percent of recreation site visitors indicated using this trail during their visit to the site and survey respondents identified a need to improve this trail. If improving the informal river access trail is not feasible, or if the maximum amount of funds are not necessary to improve the trail, it is unknown what alternative habitat benefit Trout Unlimited would seek to provide with the off-license funding, or the benefits that this alternative would provide for project recreation.

The high use rate of the informal river access trail by project recreation site visitors, and demand for a safe trail in this location, is likely to continue regardless of improvements made to the dirt river access trail. By incorporating the user-created informal river access trail into the project boundary, classifying the trail as a project facility, and implementing the same structural improvements proposed by PacifiCorp, the same benefits to recreational resources and visitor experiences, which PacifiCorp's measure identifies, would occur. Including the trail within the project boundary as a project facility would also ensure that it would receive regular maintenance.

In general, when funds are proposed to be paid to a non-licensee entity for a measure, staff analyzes the actual measure itself to determine whether the measure addresses an identified project effect or would enhance a resource affected by the project. PacifiCorp describes the proposed improvements to the user-created informal river access trail and proposes a $30,000 cost necessary to implement those improvements.

PacifiCorp states that O&M costs would be included in the project's $247,000 annual cost for O&M.

The approximately 200-foot portion of the trail consists of a large-boulder surface. PacifiCorp's proposed improvements would enhance recreation and improve access to recreational opportunities in the bypassed reach. To the extent that improved recreational amenities encourage recreational use of the area, this is expected to be primarily amongst the group of recreationists already familiar with, and who use the site for all applicable recreation activities – walking, fishing, whitewater boating. Improvements to the trail would encourage existing users of the area to continue to recreate at the location, and maintaining the approximately 200-foot section of the trail, from the asphalt path to the bypassed reach shoreline, would ensure that benefits to recreational use continue. Improvements to the trail could also benefit future recreational activity associated with PacifiCorp's proposal, REC-9, to provide boater flows in the bypassed reach (discussed below). Although PacifiCorp would be responsible for the trail, because it would be a project facility, another entity could provide maintenance work on the trail as part of an off-license agreement with PacifiCorp.

Including a detailed recreation plan for constructing and maintaining the proposed project recreation site improvements that would at a minimum address: (1) the content and placement of the informational signage; (2) the design and placement of the year-round permanent vault toilet and of the new, or modified, picnic site; (3) the plan for removal of the former sandbox play area fencing; (4) the plan for repaving the recreation site access road and asphalt path; and (5) the designs for improvements to both bypassed reach access trails, would minimize and mitigate effects on project recreational resources. Any plan should include special considerations for design and construction along steep parts of either of the trails to ensure safe access to the bypassed reach. Any plan should also include conceptual drawings, and Exhibit G drawings indicating the improvements are project recreation facilities, of the trail improvements, vault toilet, informational signage, and picnic site to ensure that the improvements are designed and built appropriately.

Online Flow Information

PacifiCorp proposes to create, host, and maintain a webpage to be linked on the PacifiCorp corporate website, and on the Weber Project website, to provide real-time, approximate flow data online to the public. Instead of installing a stream gage to collect flow data, PacifiCorp proposes to automate the calculation of streamflow in the bypassed reach by subtracting project generation flow from the existing upstream USGS gaging station (No. 10136500) flow data and publishing it to the webpage linked on the two PacifiCorp websites.

Our Analysis

Public access to accurate flow information within the bypassed reach would benefit whitewater boaters using the river on days when excess flows, suitable for whitewater boating, are currently diverted to the bypassed reach, and when boater flows would be scheduled for release, as proposed in PacifiCorp's REC-9 measure. Providing real-time flow information on the PacifiCorp corporate website, and on the Weber project website, could help to inform boaters when deciding whether or not to paddle the bypassed reach that particular day – it would enable whitewater boaters to make well-informed decisions on whether the bypassed reach flow is optimal, too high, or too low to have an enjoyable and safe boating experience. Whitewater boaters could also use the flow information to plan trips that could happen with short notice, or to cancel trips if flows in the bypassed reach are not optimal. On its websites, PacifiCorp could also provide the dates, times, and proposed (or forecasted) flow levels of the four scheduled boater flow releases proposed in REC-9.

Anglers desiring to fish in the bypassed reach could also benefit from this publicly available flow information to plan fishing trips during times when flows are preferable, and to avoid times when flows could create potentially non-wadeable conditions, limiting their access to the river other than from the river bank. Providing this flow information to the public allows whitewater boaters, anglers, and all other visitors to know what is occurring in the bypassed reach. The flow information website would provide all users of the project bypassed reach of the Weber River with a central repository for bypassed reach flow data that is currently not available. Providing details about the proposal to provide publicly available flow data online in a recreation plan would be necessary before the Commission could approve the plan.

Whitewater Boating Flow Releases and Plan

PacifiCorp proposes to release a series of whitewater boating flows contingent that a safe and legal take-out/portage site is identified by American Whitewater, and as described in PacifiCorp's proposed measure, if Forest Service accepts the proposal, and Forest Service and DWCCC agree to the take-out/portage location. The take-out/portage location is anticipated to be situated close to the DWCCC irrigation diversion dam where vehicle access is possible from a gated Forest Service access road on river left. PacifiCorp would provide boater flows to the bypassed reach by curtailing generation (up to 320 cfs, or inflow) for 4-hour segments, on four Saturdays prior to July 15, annually. As proposed in REC-9, the exact schedule of the whitewater boater flow releases would be determined in conjunction with American Whitewater and would be coordinated with the Forest Service and DWCCC. If agreement among the parties (PacifiCorp, Forest Service, American Whitewater, and DWCCC) would result in a delay in releasing boater flows, PacifiCorp would "make up" for delayed boater flow releases at a rate of two per year, for up to 10 years. Further, as proposed, PacifiCorp would ensure that after such an

agreement between the parties occurs, any required enhancements for the take-out/portage site (e.g., signage, steps for egress, etc.) would be installed as soon after the agreement as possible to ensure no additional delays to releasing boater flows, and no later than the following year.

PacifiCorp also proposes that the releases of whitewater boating flows in the future could be subject to the determination that whitewater boating participation is minimal, or non-existent, during the four scheduled boating flow releases. PacifiCorp and American Whitewater agreed that any changes made to the boater flow regime would be as a result of the previous year's rolling average of a minimum of four boaters present during each flow release event. Fewer than four boaters per event (calculated by the previous year's rolling average) would result in one fewer event the following year. Additionally, the same reduction would occur if there were two or more "zero events" (i.e. when no whitewater boaters attend a boater flow release event) in a row; although, extreme weather, or other extenuating circumstances, would be acknowledged for any determination made under the consecutive "zero event" scenario. A "zero event" would need to be noticed to American Whitewater staff no later than five days after the boater flow release (generally, by close of business the Thursday following a Saturday flow event) in order to trigger any changes in flow release events under the consecutive "zero event" scenario. An increase above the four boaters per flow release event, based on the same calculation, would result in the re-instatement of one flow release event the following year. Changes to the number of flow release events, either decreasing or increasing, would not exceed one flow release event per year. The minimum possible number of flow release events per year would be one event, to prevent a total loss of flow release events. Frequent or long periods of non-use by whitewater boaters during a flow release event may result in an evaluation of a minimum boater flow release trigger (i.e. no flow release event, unless a minimum threshold of boaters is present for previous flow release events); PacifiCorp and American Whitewater would collaborate on the need for this, as necessary. Interested parties involved in PacifiCorp's ALP relicensing process agreed to and signed the MOA containing this proposal for releasing whitewater boating flows that seeks to enhance recreational resources associated with the project.

PacifiCorp's proposed REC-9 measures is included in the MOA; as such, it is supported by the MOA parties. Forest Service 4(e) condition 21 requires implementation of the MOA.

Our Analysis

As previously noted, the Weber River offers one of the closest whitewater boating opportunities for Wasatch Front-based boaters. PacifiCorp's proposal to provide scheduled whitewater boating flow releases would address the project's current effects on the availability of whitewater boating flows in the bypassed reach and would benefit whitewater boaters by providing a total of 16 scheduled hours of additional boatable

flows per year. By providing scheduled whitewater boating flows of 320 cfs or inflow the measure would provide enhanced whitewater boating opportunities. Although, PacifiCorp indicates that anglers desiring to fish the project bypassed reach, during the scheduled boater flow release events, would potentially encounter non-wadeable conditions that would limit their access to the river other than from the river bank.

Whitewater boating use occurs in the project bypassed reach, but only as flows are available. The bypassed reach contains several named areas and rapids of varying whitewater difficulty classes; therefore, additional augmented whitewater boating flows would make these areas and rapids available to a diverse group of whitewater boaters with different skill levels. Study results indicate a demand for higher flows, and the result of providing higher flows will cause areas of the bypassed reach to be more boatable and the boating experience to be more enjoyable. In very dry years, PacifiCorp's proposed whitewater boating flows would increase opportunities for boatable flows on the bypassed reach by up to four, 4-hour occasions annually; however, when the minimum acceptable boatable flow is considered, the scheduled flow releases may not create significant new whitewater use when all water years are considered since the project can only contribute up to 320 cfs by curtailing generation. Additionally, when all water years are considered, the scheduled boatable flow releases would mostly augment the number of existing annual boatable flows, and not necessarily create new opportunities, although the predictable schedule of four, 4-hour flows would be beneficial.

The time-frame for the proposed four, 4-hour Saturday releases, prior to July l5 annually, incorporates the months with the highest mean daily flows (see Figure 6) in the project bypassed reach and includes May – the month when the Recreation Use and Demand Study trail camera captured the greatest number of whitewater boaters (i.e., kayakers) utilizing the user-created informal river access trail to put-in on the bypassed reach. Although generation would be nominally affected by the loss of a potential 48MWh during the REC-9 April to July timeframe, increasing and enhancing boatable flows during the highest whitewater boating use season would provide increased opportunities for the whitewater boating community to utilize the resource.

PacifiCorp's proposed scheduled boating flow releases would benefit whitewater boating recreation by increasing the number of days per year that boatable flows would be present in the bypassed reach by at least four days. Each scheduled boating flow release event would reduce project generation of power for a total period of four hours per release (16 hours, and up to 48MWh annually), and reduce wadeable flows for anglers by four hours on the Saturday of the scheduled release. However, the amount and duration of scheduled boating flow releases would not significantly impact overall power generation or the number of days with desirable wadeable flows in the bypassed reach for anglers.

Whitewater boaters currently use the river access trails at the west end of the project recreation site to access the bypassed reach. While some boaters currently take out close to the DWCCC diversion dam, others commented in the study that it was not an ideal location because it required boating portions of the bypassed reach that are not easily boatable without significant flows. By implementing the proposed REC-9 measure, this will increase flows in the less desirable portions and enable whitewater boaters to fully utilize the bypassed reach. Currently, whitewater boaters might not utilize the lower portion of the bypassed reach because there is no formal take-out/portage near the end of the bypassed reach. Creating a formal take-out/portage close to the DWCCC diversion dam would not be within the bypassed reach; however, it would enhance the whitewater boating use of the lower bypassed reach by providing a take-out location in this area where no safe, formal take-out exists. Consultation and coordination with interested parties and agencies regarding river access (put-in/portage), flow schedule, instream flows, or changes to implementation of the boating flow release regime, as a result of changes in participation levels, would be conducted after each year of releases, as proposed in REC-9. This coordination would help to ensure (1) that a safe take-out/portage, once agreed upon between parties and constructed, is maintained, and (2) the appropriate number of proposed whitewater boating flow release events would occur annually as a result of the previous year's boating use of each scheduled whitewater boating flow release event.

As described above, PacifiCorp's proposal to provide whitewater boating flows would consist of various stages of outreach and partnership effort to implement the measure. As such, developing a release plan for the proposed whitewater boating flows would ensure that formalized protocols exist relating to communication, scheduling of releases, operational procedures, and development of the take-out/portage facility.

Cumulative Effects

The primary past and present actions within the Weber River Canyon that influence river-based recreation uses and opportunities include water diversion, water storage (irrigation) operations; hydroelectric, highways; and railroad development. Natural seasonal and year-over-year flow fluctuations also may affect river-based recreational opportunities within the basin. Operations that divert stream flow within the basin (such as the irrigation diversion downstream of the project) typically result in a net loss or degradation of river based recreational opportunities as a result of the removal of flow from the stream. In some cases, and at some periods of the year (such as the summer months), stream diversions partially or completely dewater stream segments making them unavailable for recreational activities such as fishing and boating. Operations that divert stream flow also may result in the curtailment of access to the stream and stream banks for river-based recreation. Operations that impound stream flow and create reservoirs, such as the upstream Echo Reservoir, also impair river-based recreation activities because they convert a portion of the river system from river-type to

lake-type. However, impoundments also create lake-type recreational opportunities that include fishing and boating, offsetting the loss of the river-based recreational opportunity. The construction and presence of highways, other roads, and the railroad within the Weber River Canyon have, over time, resulted in access-related constraints on river-based recreation. For example, the presence of the I-84 freeway within Weber Canyon, limits points of access for recreationists to the Weber River are largely limited to access from the project recreation site and the Utah DOT rest stop upstream from the project recreation site. Other access points have been restricted due to safety reasons associated with the I-84 freeway as well as the railroad and the presence of project facilities such as the powerhouse.

Implementation of the proposed action, including specifically the PM&E measures REC-1 through REC-9 would increase and enhance the recreation opportunities available within the project area as described above. These measures would primarily enhance existing recreation opportunities such as fishing, whitewater boating, and stream-side picnicking. However, the implementation of PM&E measure FISH-2 would temporarily contribute to losses of project-related recreation opportunities within the project recreation site for the duration of the fish ladder construction because access to the project recreation site and adjacent Weber River access trails would be prohibited. Also, the project powerhouse would continue to be a restricted access zone because there are no demonstrably safe ingress and egress points for the public to use to access the river in this location.

3.3.6 Land Use and Aesthetic Resources

3.3.6.1 Affected Environment

Land Use

The project is located within Weber, Morgan, and Davis Counties, Utah. Weber Canyon, in the vicinity of the project, is used primarily as a transportation and utility corridor that is part of the route linking the greater Salt Lake City metropolitan area with Denver, Colorado. The canyon contains the double-track railroad corridor of the UPRC, and the I-84 freeway, a four-lane, east- and west-bound divided highway. Project facilities are either situated within lands of the UWCNF, administered by the Forest Service, or private lands of the UPRC. The project powerhouse and associated project facilities, the project diversion dam, intake structure, and non-operative fish passage/ ice chute structure, the Weber forebay, project recreation site, and portions of the eastern and western ends of the penstock occupy lands of the UWNCF. Approximately 1 mile of the middle section of penstock is located on private land owned by UPRC (see Figure 1).

Table 13. Existing land ownership within the project boundary (Source: PacifiCorp 2018a, as modified by staff).

Ownership/Management	Acres
U.S. Forest Service	15.51
Private	2.97
Total	18.48

Aesthetic Resources

The visual setting of the Weber Canyon is characteristic of many steep-sided canyons in the Wasatch Mountains because of its dramatic topography and colorful, although limited, vegetation. The project is located at approximately 4,600 feet elevation, within the narrow, steep-walled Weber Canyon, in a highly altered riverine and canyon floor environment, due primarily to the construction of the I-84 freeway and its associated bridges and infrastructure (e.g. I-84 freeway rest area). Further alterations to the natural environment were caused by a former highway which preceded the I-84 freeway, various non-project pipelines, cable and fiber utility lines, the UPRC railroad track corridor, and other non-project river diversion structures (e.g. DWCCC irrigation diversion dam). The river was channelized and modified to make way for and accommodate construction of the I-84 freeway and the UPRC railroad track corridor. Additionally, areas of fill, up to 30 feet deep and placed primarily to facilitate the construction of the I-84 freeway, altered the original appearance of the canyon floor.

3.3.6.2 Environmental Effects

Effects of Construction-related Activities

The construction of the proposed fish ladder would include excavating, leveling, grading, and staging equipment and materials. In addition to the potential visual effects, traffic associated with the construction activity could impede public access to the project recreation site and adjacent I-84 freeway rest area and create noise. Neither PacifiCorp nor stakeholders proposed measures to mitigate potential effects from construction activity on traffic or noise within the project area.

Our Analysis

PacifiCorp's proposed fish ladder structure would be constructed on the north bank of the Weber River, in an east-west alignment, perpendicular to the existing project diversion dam, with the top of the ladder structure immediately adjacent to the existing non-operative fish ladder/ice chute. The fish ladder would be situated on UWCNF land alongside the existing project recreation site parking area. PacifiCorp estimates

construction would occur over an approximate 9-month period, and be completed within a single, in-water work period, ideally during the lowest flow portion of the year from October through December. All construction activities are anticipated to occur during daylight hours; however, some concrete pours could extend past daylight hours, into the following day, depending on the complexity of, and conditions during, the pour. The total area of disturbance for construction includes the footprint of the fish ladder and approximately 10 feet around the fish ladder footprint to the north and west where construction activities would occur (a total of approximately 0.16 acre).

Fish ladder construction would result in ground-disturbing activities alongside the project diversion dam, and construction-related activities and traffic within the project recreation site. The area in which the fish ladder would be situated is previously-disturbed, un-vegetated, and a large portion is a concrete or asphalt surface. PacifiCorp anticipates a need for certain construction equipment as described in section 3.3.5.2 (e.g. trackhoes, concrete trucks); however, they do not detail how excavated excess soil would be transported away from the site, nor did they detail how construction workers would arrive to the site. We anticipate that construction workers would arrive and depart the fish ladder construction site (the project recreation site) daily, by pickup truck or passenger car. During the construction period, visitors to the recreation site would be prohibited from entering the site and from accessing the bypassed reach of the river from the site for the approximate nine-month duration of construction activities, because of the increased number of vehicles accessing the site daily and construction vehicle traffic within the site. PacifiCorp would support the Forest Service and Utah DWR with public outreach explaining the expected 9-month recreation site closure while the fish ladder construction takes place.

Construction of the year-round permanent vault toilet, repaving the recreation site access road and asphalt path, and construction activities to improve the two river access trails and to create a new (or modify an existing) picnic site could temporarily impact public use and access of project lands, and would have a minimal effect on land use. Because the project is adjacent, or in close proximity, to the I-84 freeway, non-project pipelines, a non-project substation, and the UPRC railroad line corridor, as well as other non-project river diversion dams, land use impacts associated with proposed construction activities would be nominal and would not be a departure from current surrounding land use activities. Therefore, no issues regarding land use resources are expected to arise from proposed project construction activities.

Because the project is adjacent to the I-84 freeway, non-project pipelines, and UPRC railroad lines, as well as other non-project developments and infrastructure, noise and other aesthetic effects, and land use impacts of construction would be marginal and would not present a contrast from the existing surrounding environment. Therefore, no issues regarding land use or aesthetic resources are expected to arise from project construction.

Effects of Continued Project Operation and Maintenance

Project Boundary

Commission regulations require including only lands within the project boundary that are necessary to operate and maintain the project and for other project purposes, such as recreation, shoreline control, or protection of environmental resources (18 C.F.R. 4.41[h][2]). PacifiCorp proposes to modify the project boundary (see Figure 1) to: (1) include additional land needed for project operation and maintenance, and (2) exclude non-project features and land not required for project purposes. PacifiCorp's proposed modifications to the project boundary would reduce the amount of federal land within the project boundary, administered by the Forest Service, by 0.57 acre (from 15.51 acres to 14.94 acres).

Our Analysis

PacifiCorp proposes to include existing powerhouse access roads, not previously considered project access roads, in the proposed modified boundary. Including these existing roads would formally recognize them as project facilities and they would continue to provide direct access to the powerhouse for operations and maintenance of the project. To the east of the powerhouse, PacifiCorp proposes to add the area between the powerhouse access road and the Weber River shoreline, to the south, and the area between the powerhouse access road and the edge of the I-84 freeway right-of-way, to the north, to encompass access roads, buildings, and maintenance areas. In addition to incorporating these facilities, this would incorporate the Weber River riparian area, in the vicinity of the powerhouse, into the project boundary. To the east of the diversion dam, PacifiCorp would add small portions of land to the project boundary to more accurately align the boundary with the forebay shoreline. PacifiCorp also proposes to add the area from the diversion dam to approximately 520 feet downstream of the diversion dam to incorporate the river and riparian areas that are situated between the recreation site, on the north bank of the river, and the penstock, on the south bank of the river, to provide a management buffer downstream of the diversion dam. Small adjustments to remove land from the project boundary would also be made to the north side of the project recreation site, and along the project recreation site access road, to avoid encroachment on the I-84 freeway and associated rest area. Together, these proposed boundary modifications are consistent with the Commission's regulations regarding including lands necessary for project operation and maintenance.

Currently, the amount of land that would be added to the project boundary by incorporating the user-created informal river access trail, as discussed in section 3.3.5.2, is not yet known; however, the final alignment and dimensions of the trail would be determined by PacifiCorp and the Forest Service. PacifiCorp would revise the project

boundary after the trail is constructed. The proposed widths and revisions to the project boundary, after trail construction, would provide adequate buffers for project operation and maintenance activities. Incorporation of the user-created informal river access trail would provide formal access to the bypassed reach for recreational use, on an already widely-used, non-project access route.

PacifiCorp also proposes to remove lands from the project boundary where project facilities are not located and are not needed to operate and maintain the project. Table 14 presents our analysis of removing these areas from the project boundary.

Table 14. Analysis of areas proposed for removal from the project boundary (Source: Staff).

Area (ownership)	PacifiCorp Rationale for Removal	Analysis
Land along the northern edge of the recreation site and access road (NFS land)	Improves alignment with existing project facilities and avoids encroachment on the I-84 freeway rest area.	Removes lands that would not have project recreation facilities or be used for project recreation activities and retains lands on which project recreation facilities and access road are situated.
Land immediately east of the intersection of the project recreation site access road and the I-84 freeway rest area access road (NFS land)	Avoids encroachment on the I-84 freeway rest area.	Removes lands that would not have project recreation facilities or be used for project recreation activities.
Land adjacent to, and downstream (west) of, the project powerhouse and transmission line (NFS land)	Improves alignment with existing project facilities and removes the non-project substation, Weber River and shoreline, and the DWCCC diversion dam from the project boundary.	Removes lands and non-project facilities with no project purpose and retains the project powerhouse access road to the project powerhouse and transmission line.

Fire Prevention and Response

Project construction, and continued operation and maintenance, including recreational use (i.e. picnic site grills), increase potential for wildland fire occurrence. PacifiCorp does not propose any measures related to fire prevention. Forest Service 4(e) condition 20 would require PacifiCorp to develop a fire prevention and response plan in consultation with the Forest Service. The plan would detail PacifiCorp's responsibility to: (1) identify hazard reduction and recurring maintenance measures in order to prevent

the spread of fire outside of the project boundary, (2) address fire hazard and public safety associated with public recreation use and access of the project facilities, (3) report any project-related fire immediately to the Forest Service, (4) analyze fire prevention and suppression equipment and personnel, and advise Forest Service of the locations and availability of those resources.

Our Analysis

Project operation and maintenance, including recreational use, increase the potential of wildland fire occurrence. Developing a fire prevention and response plan, as required by Forest Service, would help prevent and minimize potential project-related fires from spreading beyond project lands, and would aid Forest Service personnel if a fire were to move beyond the project boundary. Implementing the plan would also reduce the effects of project-induced fire, which would protect PacifiCorp's hydropower assets and the environmental resources and non-project facilities and infrastructure on or adjacent to project lands.

Aesthetics

Pacificorp's proposed new project facilities and improvements to existing facilities include: (1) a fish ladder; (2) a year-round permanent vault toilet accessible to persons with disabilities; (3) a picnic site, accessible to persons with disabilities, consisting of a concrete pad, grill, and picnic table; (4) a parking area alongside the fish ladder; (6) improved interpretive signage at the project recreation site; (7) constructing steps on the existing user-created river access trail at the west end of the project recreation site; and (8) repaving the existing project recreation site access road and asphalt path. These new facilities and improvements would be visible within the project recreation site. Additionally, the fish ladder, year-round permanent vault toilet, parking area alongside the fish ladder, and the repaved access road and asphalt path would likely be visible from the I-84 freeway. PacifiCorp is not proposing any changes to the existing project diversion structure, penstock, powerhouse, or transmission line. Although PacifiCorp proposes to coordinate with the Forest Service on improved interpretive signage that would be installed at the project recreation site, it is not proposing, nor have any other entities recommended, specific measures for protection or enhancement of aesthetic resources.

Our Analysis

Existing project facilities would continue to have nominal effect on aesthetics because the project facilities are adjacent, or in close proximity, to the I-84 freeway and freeway rest area, non-project pipelines, a non-project substation, and the UPRC railroad line corridor, as well as other non-project river diversion dams. Because the project facilities are adjacent to these numerous non-project facilities, noise and other temporary

aesthetic effects due to construction of the fish ladder and recreation site improvements, and ongoing operation and maintenance of project facilities, would not present a noticeable contrast from the existing surrounding environment. Therefore, no issues regarding aesthetic resources are expected to arise from the temporary construction of facilities and continued operation of the project.

3.3.7 Cultural Resources

3.3.7.1 Affected Environment

Section 106 of the National Historic Preservation Act

Section 106 of the NHPA, requires the Commission to take into account the effects of licensing a hydropower project on properties listed or eligible for listing in the National Register and allow the Advisory Council on Historic Preservation (Advisory Council) a reasonable opportunity to comment if any adverse effects on historic properties are identified within the project's area of potential effects (APE).

Historic properties are defined as any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. In this document, we also use the term "cultural resources" to include properties that have not been evaluated for eligibility for listing in the National Register. In most cases, cultural resources less than 50 years old are not considered eligible for the National Register. Cultural resources need enough contextual integrity to be considered historic properties. For example, dilapidated structures or heavily disturbed archaeological sites may not have enough contextual integrity to be considered eligible. Traditional Cultural Properties (TCPs) are a type of historic property eligible for listing in the National Register because of their association with cultural practices or beliefs of a living community that are: (1) rooted in that community's history; or (2) important in maintaining the continuing cultural identity of the community (Parker and King, 1998). Section 106 also requires that the Commission seek concurrence with the corresponding State Historic Preservation Office on any finding involving effects or no effects on historic properties. For this project, the Utah SHPO would need to concur with any such finding.

If existing or potential adverse effects have been identified on historic properties, license applicants need to develop a HPMP to seek to avoid, reduce, or mitigate the effects. Potential effects that may be associated with a hydroelectric project include any project-related effects associated with construction, or the day-to-day operations and maintenance of the project after issuance of an original license.

Culture Historic Overview

Aboriginal Era

The project area lies within the Weber River Basin of which the river ultimately flows into Great Salt Lake and falls within the Great Basin cultural physiographic region. The hydroelectric project is located along a steep canyon known as Weber Canyon, which cuts through the Wasatch Mountains. During the end of Pleistocene, Great Salt Lake was a much larger basin of water known as Lake Bonneville which was the largest salt water lake in the Western Hemisphere. About 16,000 years ago, Lake Bonneville began to drain away down along Red Rock Pass further to the north in Idaho. Ancient peoples coming out from Eurasia, crossed the Alaska land bridge and made their way into the Great Basin and Great Salt Lake area at the close of the Pleistocene sometime around 11,000 BC. Prior to European contact, the Great Salt Lake area would have been inhabited by native peoples associated with various Shoshone, Utes, and Paiute tribal groups. Aboriginal groups subsisting in the region would have used the surrounding canyons, such as Weber Canyon, on a seasonal basis. These groups were mostly hunter gatherers who moved from one area to the next seasonally, subsisting on a wide variety of plant and animal species. Native populations who were in and around the eastern side of Great Salt Lake and in the Weber River Basin at the time of Euro-American contact would have been most likely associated with the Weber Ute, who were actually Western Shoshones, despite being named Utes.

Euro-American Era

Euro-Americans first entered the present State of Utah in the late 1700s, when an expedition led by the Spanish friars, Francisco Atanasio Dominguez and Silvestre Velez de Escalante entered the Utah Valley of northern Utah.[17] The Spanish never made it as far north into the Great Salt Lake area, but other Euro-American trappers such as Louis Vasquez, Etienne Provost, and Jim Bridger have been acknowledged separately as discovering the lake in the 1820s, and surveyed portions around it, and probably crossed near the mouth of Weber Canyon at that time. During this period, trappers were mostly attracted to the area for beaver and other fur bearing animals, and as a result, trading posts and other meeting places were established in the region where hunters and tradesmen could meet and congregate for exchanging pelts, goods and money. Initially, native peoples benefited from the exchange of their pelts and other goods, for money, weapons, iron utensils, and other manufactured products, but quickly acquired deadly European diseases, such as small pox, which reduced their numbers significantly, and had severe impacts on their traditional habits and lifeways of hunting and gathering over vast tracks of territory throughout the region. Beavers and other fur bearing animals were also

[17] This narrative is taken from Lechert and Krussow 2017.

over-exploited in the region within a few decades, and in a combination of declining fur prices and shifts in fashion, the overall market for furs collapsed dramatically by the early 1840s, and most trading posts in the region were abandoned shortly afterwards. At the same time, the United States government was beginning to take more interest in the far West, sending out survey parties to accurately map the Great Salt Lake region. One of these parties was led by John Fremont who issued maps and reports on the Great Salt Lake area and Wasatch Mountain Range between 1843 and 1845. In a few years afterwards, these maps and reports were used by Brigham Young in the migrations of Mormons from the Midwest to Great Salt Lake. As early as 1841, a migrant party passed through the north portion of Great Salt Lake, led by John Bidwell and John Bartleson, as they attempted a shorter route to California, and used Weber Canyon as part of the route to access the Great Salt Lake basin. In 1846, the ill-fated Donner party passed along the same way to California but deviated away from using the route through Weber Canyon.

With the passage of the Pacific Railway Act of 1862, the UPRC railroad reached Utah in 1868, and an eastward route of the railroad from California reached the mouth of Weber Canyon, and later that year passed through the canyon. A second railroad line was put through the canyon in 1916. The railroad line has been improved over the years but the original route through Weber Canyon is still in use today. A wagon road had originally passed through Weber Canyon during the nineteenth century and was replaced with an improve road for automobiles in 1926, eventually called U.S. 30 S. In the 1950s, the road was expanded later as part of the national interstate highway system and was renumbered as Interstate 84 (I-84) in 1977.

At the end of the nineteenth century, and with the addition of the transcontinental railroad, industrial and urban development on the eastern side of Great Salt Lake increased significantly giving way for a greater demand for electricity. Street cars, lighting along the streets, and public lighting in Salt Lake City, Provo, and Ogdon brought about the formation of local electric power companies. These local companies quickly realized the potential for using hydroelectric power in the surrounding high elevation areas, especially in places like Weber Canyon that was already accessible by rail. In the early 1900s, the Utah Light and Railroad Company (UL&RC) was founded, and by the spring of 1908, construction on the Weber Hydroelectric Plant began (named originally as the Devil's Gate Plant until 1917 when it was renamed the Weber Plant). Upriver 3 miles from the mouth of the canyon, the dam was first constructed that included a 1,200-foot reinforced-concrete buttressed retaining wall behind the dam to reinforce the railroad grade running along the impoundment above the dam. Later that year, a concrete pipe was extended 2,000 feet from the dam along the canyon and joined to a 74-inch wood stave pipeline that extended another 7,075 feet downward to a double-riveted steel penstock. From 1909 to 1910, the powerhouse was constructed that ran a single water turbine and generator of 2,500 kilowatts. Along with the powerhouse, 3 brick powerhouse operator residences were built. In 1910, UL&PC put the hydropower facility into operation. During the 1920s and 1930s, other structures were added to the

hydropower facility including another workers cottage, garage, and other outbuildings. The wood stave pipeline was replaced in the 1940s. Two operator residences were removed in the 1970s, and the remaining two residences were left unoccupied as a result of a major flood in the canyon in 1982. The 1910 powerhouse also underwent a major renovation in 1983 due to a fire.

Area of Potential Effects

Pursuant to section 106 of the NHPA, the Commission must take into account whether any historic property could be affected by issuance of a subsequent license within a project's APE. The APE is defined as the geographic area or areas that an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. For this relicensing, the project's APE consists of all lands within the existing and proposed project boundary (proposed to be 18.08 acres—a slight decrease in the original FERC project boundary) and any lands outside the project boundary where cultural resources may be affected by project-related activities. The project's APE includes both private and federal lands administered by the Forest Service. Forest Service lands would occupy 14.94 acres (a reduction of approximately half an acre of Forest Service lands from the original project boundary) of the proposed project APE.

In 2016, the project's APE was inventoried for cultural resources by PacifiCorp's professional contactor, SWCA, as part of PacifiCorp's relicensing effort (Lechert and Krussow 2017). SWCA inventoried nearly 60 acres within and adjacent to the original FERC project boundary, of which 17 acres were intensively surveyed, and where 34 acres were surveyed on a reconnaissance level. The remaining 8.5 acres were not surveyed because they are portions of existing paved roads.

No archaeological sites were located, and there is little likelihood of any intact aboriginal occupations occurring within APE due to intensive ground disturbing activities related to construction of the hydropower facility, railroad, and modern landscaping of the interstate highway, which run virtually parallel to one another through the confined space of Weber Canyon.

However, SWCA did document three existing historic properties, including the Weber Hydroelectric Project (listed as a historic district on the National Register in 1989), a segment of the UPRC railroad, and a portion of the Historic U.S. 30S highway.

As a historic district, the Devil's Gate/Weber Hydroelectric Power Plant consists of a powerhouse, reinforced-concrete dam (including the original fish passage structure and related structures), concrete and steel conduit, and operator's camp, including two residences and 4 ancillary structures. Of the 10 ten structures included within the historic district, eight are considered contributing elements, and the remaining two, are considered noncontributing. One of the noncontributing structures—the conduit, which

runs from the dam to the powerhouse—has been left out of the district; thus, the district is made up of two discontinuous elements, the dam (upriver portion) and power house site (downriver portion). Despite numerous modifications to the hydropower facility, it retains enough integrity to represent an early twentieth century, medium-head hydroelectric power plant.

The segment of UPRC railroad that lies within the APE consists of the existing railroad line that runs through Weber Canyon along the south bank of the Weber River in the dam portion of the project area. Below the project dam, the railroad crosses over to the north bank of Weber River and exits the project area above the powerhouse but continues downriver to the mouth of Weber Canyon. As discussed above, the original rail line in Weber Canyon was first laid in 1868, then improved in 1916. Although numerous modifications and improvements have taken place over the years, the historical integrity of the railroad remains intact and represents a section of the transcontinental railroad route, which in turn, portrays a pinnacle role in connecting the continental United States from coast to coast, and in the overall development of the American West after the Civil War.

A segment of the original alignment of U.S. 30S also runs through the project boundary, running on the north bank of Weber River near the dam, and continuing downriver where it oxbows to the north and down again back to the river, paralleling the I-84 interstate to the south. The existing section of U.S 30S that runs through the project's APE is approximately 13 feet wide and 3,816 feet long and contains both asphalt and dirt surfaces. Although this segment of U.S. 30S has been heavily disturbed by improvements to the railroad and route of the I-84 freeway, remains of the roadbed--3 inches in thickness at places, are still visible, some of which contain concrete retaining walls, concrete and stone footers, and rock riprap. Outside the project boundary, the road alignment appears to run in both directions through the canyon, but no visible signs of the roadbed were observed. Overall, the segment of U.S. 30S which runs through the project area represents the development of automobile transportation entering the Great Salt Lake basin during the first part of the twentieth century and retains much of the original roadbed.

3.3.7.2 Environmental Effects

PacifiCorp proposes to construct a new fish ladder that would be located on the north side of the original historic fish passage structure on the dam, which presently operates as the spillway, also known as the "ice chute". PacifiCorp anticipates that the planned installation of the new fish ladder would run adjacent to, and intersect with the historic fish ladder, but would not likely affect any of the historic characteristics of dam or associated features, including the existing fish passage structure itself. However, once formal plans for construction of the new fish ladder have been crafted, PacifiCorp proposes to initiate formal review of those plans with the Utah SHPO. Such review and

consultation procedures between PacifiCorp and the Utah SHPO are also detailed in PacifiCorp's revised HPMP. PacifiCorp also plans to install a vault toilet facility in the project's powerhouse parking lot. Although the powerhouse is a contributing element to the project's historic district, PacifiCorp asserts that construction of the vault toilet facility would not affect the historic characteristics or integrity of the powerhouse and associated historic district. Nonetheless, once finalized, PacifiCorp proposes to initiate formal review of the plans for construction of the vault toilet facility with the Utah SHPO, and as with consultation involving the new fish ladder, the procedures for such consultation are detailed in PacifiCorp's revised HPMP. The Utah SHPO originally concurred with PacifiCorp's finding that no adverse effects would occur to historic properties as a result of the new license, but stated that if further work is undertaken, such as construction of the fish ladder, that additional consultation would need to take place (See PacifiCorp's filing of Utah SHPO letter dated December 16, 2016, filed on April 20, 2018). No other project-related effects have been identified to either the UPRC railroad or segment of U.S. 30 S road alignment within the project's APE but would be monitored throughout the term of the new license by PacifiCorp as specified in the revised HPMP.

Our Analysis

In a letter dated, March 22, 2018, we requested that PacifiCorp revise their HPMP (filed with their draft license application on December 15, 2017) to include: (1) an Appendix A that includes National Register of Historic Places registration forms involving all historic properties located with the APE; (2) detailed maps that showed each of the historic properties located within the APE, including the UPRC railroad, U.S. 30S segment, and all contributing and noncontributing elements of Devil's Gate/Weber Hydroelectric Power Plant Historic District; and (3) a new section to elaborate more detail on whether any new improvements or constructions plans would affect, or not adversely affect, any of the identified historic properties, especially involving the construction of the new fish ladder and vault toilet facility, and how any potential adverse effects to any historic property would be resolved. After PacifiCorp revised their HPMP, accordingly, they were instructed to send out the revised document to the Utah SHPO and Forest Service for comment and review, make any additional changes, as a needed, and then file the revised HPMP with their FLA.

On May 18, 2019, PacifiCorp filed a revised HPMP that addressed staff comments. PacifiCorp stated in Appendix E of their revised HPMP that both the Forest Service and Utah SHPO had no additional comments on the revised HPMP; however, PacifiCorp did note that Utah SHPO reiterated that PacifiCorp's plans for the work being proposed for the new ladder would need to be further reviewed, and that they would not automatically concur with a finding of no adverse effect involving the construction associated with it.

We agree with the Utah SHPO's concurrence with PaciCorp's finding that that no adverse effects would occur on historic properties as a result of the relicensing. However, we acknowledge that further consultation would need to take place between the Utah SHPO and PacifiCorp when plans for the new fish ladder and toilet facilities are finalized. PacifiCorp's revised HPMP also acknowledges further review with the Utah SHPO involving the construction of the new fish ladder and vault toilet facility and provides the necessary consultation steps for such reviews to ensure that any potential adverse effects to historic properties during the term of the new license would be resolved.

3.4 NO-ACTION ALTERNATIVE

Under the no-action alternative the project would continue to operate as it has in the past. None of PacifiCorp's proposed measures or the resource agencies' recommendations and mandatory conditions would be required. None of the staff-recommended measures would be implemented, including measures to enhance environmental conditions for fish within the project, measures to ensure effective operation of PacifiCorp's proposed fish ladder, and measures that would expand and improve recreation opportunities.

4.0 DEVELOPMENTAL ANALYSIS

In this section, we look at the proposed project's use of the Weber Hydroelectric Project for hydropower purposes to see what effect various environmental measures would have on the project's costs and power generation. Under the Commission's approach to evaluating the economics of hydropower projects, as articulated in *Mead Corporation*,[18] the Commission compares the current project cost to an estimate of the cost of obtaining the same amount of energy and capacity using a likely alternative source of power for the region (cost of alternative power). In keeping with Commission policy as described in *Mead Corporation*, our economic analysis is based on current electric power cost conditions and does not consider future escalation of fuel prices in valuing the hydropower project's power benefits.

For each of the licensing alternatives, our analysis includes an estimate of: (1) the cost of individual measures considered in the EA for the protection, mitigation and enhancement of environmental resources affected by the project; (2) the cost of alternative power; (3) the total project cost (i.e., for construction, operation, maintenance, and environmental measures); and (4) the difference between the cost of alternative power and total project cost. If the difference between the cost of alternative power and total project cost is positive, the project produces power for less than the cost of alternative power. If the difference between the cost of alternative power and total project cost is negative, the project produces power for more than the cost of alternative power. This estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license. However, project economics is only one of the many public interest factors the Commission considers in determining whether, and under what conditions, to issue a license.

4.1 POWER AND DEVELOPMENTAL BENEFITS OF THE PROJECT

As currently operated, the Weber Project has an authorized capacity of 3.85 MW and generates an average of 16,926 MWh annually.

Table 14 summarizes the assumptions and economic information we use in our analysis. This information, except as noted, was provided by in the final license application for the project. We find that the values provided by the applicant are reasonable for the purposes of our analysis. The costs are provided in 2019 dollars unless otherwise noted.

[18] See *Mead Corporation, Publishing Paper Division*, 72 FERC ¶ 61,027 (July 13, 1995). In most cases, electricity from hydropower would displace some form of fossil-fueled generation, in which fuel cost is the largest component of the cost of electricity production.

Table 15. Parameters for the economic analysis of the Weber Hydroelectric Project (Source: PacifiCorp, as modified by Staff).

Parameter	Value
Period of analysis (years)	30
Financing period (years)	20
Planned maintenance cost in $2019	$3,921,000
Operation and maintenance, $year	$30,500
Energy plus capacity value ($/MWh)[a]	$55.4
Interest rate (%)	7.0
Discount rate (%)[b]	7.0

[a] Estimate based on PacifiCorp's energy and dependable capacity estimate.
[b] Discount rate estimated by staff to be the same as the interest rate.

4.2 COMPARISON OF ALTERNATIVES

Table 15 summarizes the installed capacity, annual generation, cost of alternative power, estimated total project cost, and the difference between the cost of alternative power and total project cost for each of the action alternatives considered in this EA.

Table 16. Summary of annual cost of alternative power and annual project cost for the action alternatives for the Weber Hydroelectric Project (Source: Staff).

	No Action	Proposed	Staff Alternative [a]
Installed capacity (MW)	3.85	3.85	3.85
Annual generation (MWh)	16,926	16,878	16,878
Dependable capacity (MW)	1.42	1.42	1.42
Annual cost of alternative power ($)	$937,000	$935,200	$935,200
($/MWh)	55.4	55.4	55.4
Annual project cost ($)	$904,000	$1,257,800	$1,273,600
($/MWh)	53.4	74.5	75.5
Difference between the cost of alternative power and project cost ($)	$33,000	($322,700)	($338,400)[b]
($/MWh)	2.0	(19.1)	(20.5)

[a] Staff alternative with Mandatory Conditions Alternative is not included in the table because the cost is identical to the cost of Staff Alternative.

[b] Numbers in parenthesis are negative.

4.2.1 Weber Hydroelectric Project Proposal

As proposed, the project would have an installed capacity of 3.85 MW and generate an average of 16,878 MWh of electricity annually. The average annual cost of alternative power would be $935,200, or $55.4/MWh. The average annual project cost would be $1,257,800, or about $74.5/MWh. Overall, the project would produce power at a cost that is $322,700, or $19.1/MWh, more than the cost of alternative power.

4.2.2 Staff Alternative

The staff alternative would have the same capacity and energy attributes as proposed by PacifiCorp; but would include the staff environmental measures shown in

table 16. The average annual project cost would be $1,273,600, or about $75.5/MWh. Overall, the project would produce power at a cost that is $338,400, or about $20.5/MWh, more than the cost of alternative power.

4.2.3 Staff Alternative with Mandatory Conditions

The staff alternative with mandatory conditions include the mitigation measures and the Forest Service 4(e) and 401 conditions for annual consultation, as shown in table 16. However, since there is no additional cost associated with those conditions, this alternative has the same economic benefits as the staff alternative described above.

4.3 COST OF ENVIRONMENTAL MEASURES

Table 17 gives the cost of each of the environmental measures considered in our analysis. We convert all costs to equal annual (levelized) values over a 30-year period of analysis to give a uniform basis for comparing the benefits of a measure to its cost.

Table 17: Cost of proposed and recommended measures for the Weber Hydroelectric Project (Source: Staff).

Environmental/Mitigation Measures	Entities	Capital Cost (2019$)	Annual Cost (2019$)[a]	Levelized Annual Cost[a] (2019$)
Aquatic Resources				
1. Develop an upstream fish passage plan to design, construct, operate and maintain a fish ladder	staff	$50,000	$0	$5,000
2. Construct, operate and maintain a fish ladder (FISH-2)	MOA Parties, Forest Service (4(e) condition 21), staff	$2,889,000	$5,000	$315,970
3. Operate low-level gate for fish passage when forebay is dewatered (FISH-3)	MOA Parties, Forest Service (4(e) condition 21), staff	$65,000	$4,000	$10,600
4. Fishway operation under prolonged outage (FISH-4)	MOA Parties, Forest Service (4(e) condition 21), staff	$0	$1,000	$1,000
5. Develop a fish ladder effectiveness evaluation methodology	Staff	$5,000	$0	$390
6. Develop erosion and sediment control BMPs for project O&M activities	Forest Service (4(e) condition 19), staff	$3,000	$0	$300

Environmental/Mitigation Measures	Entities	Capital Cost (2019$)	Annual Cost (2019$)[a]	Levelized Annual Cost[a] (2019$)
7. Hazardous Materials Management Plan	Forest Service (4(e) condition 11), staff	$3,000	$0	$300
8. Hold annual consultation meeting with Forest Service to review implementation of license conditions, including the Fish Passage and Communication Plan, new federally (de)listed species, weed control, pesticide use, and newly discovered cultural resource sites as described in the MOA	Forest Service (4(e) condition 13(a)), staff	$0	$0	$0
Terrestrial Resources				
9. Develop and implement BMPs to control invasive aquatic and terrestrial weed species for project O&M activities consistent with Forest Service 4(e) condition 12 (BOT-2); consult with Forest Service and state resource agencies on any potential invasive species issues (BOT-1)	MOA Parties, Forest Service (4(e) conditions 17 and 21), staff in part	$0	$2,000	$2,000
10. Annually consult on issues relating to special-status species and sensitive areas (WL-1)	MOA Parties, Forest Service (4(e) condition 18)	$0	$0	$0
Recreation Resources				

Environmental/Mitigation Measures	Entities	Capital Cost (2019$)	Annual Cost (2019$)[a]	Levelized Annual Cost[a] (2019$)
11. Maintain the existing project recreation site, and the proposed recreation site modifications (REC-1)	MOA Parties, Forest Service (4(e) condition 21), staff	$0	$0	$0
12. Improve interpretive signage (REC-2)	MOA Parties, Forest Service (4(e) condition 21), staff	$15,000	$625	$2,150
13. Provide real-time approximate bypassed reach flow information to the public on PacifiCorp webpages (REC-3)	MOA Parties, Forest Service (4(e) condition 21), staff	$20,000	$0	$2,030
14. Install year-round permanent vault toilet that is accessible to persons with disabilities (REC-4)	MOA Parties, Forest Service (4(e) condition 21), staff	$64,000	$0	$6,490
15. Install a new (or modify an existing) picnic site that is accessible to persons with disabilities (REC-5)	MOA Parties, Forest Service (4(e) condition 21), staff	$20,000	$0	$2,030
16. Repave and maintain the project recreation site access road and asphalt path (REC-6)	MOA Parties, Forest Service (4(e) condition 21), staff	$100,000	$0	$10,150

Environmental/Mitigation Measures	Entities	Capital Cost (2019$)	Annual Cost (2019$)[a]	Levelized Annual Cost[a] (2019$)
17. Reconfigure fencing around the former sandbox play area (REC-7)	MOA Parties, Forest Service (4(e) condition 21), staff	$12,000	$500	$1,720
18. Improve bypassed reach access trail within the project boundary (REC-8(a))	MOA Parties, Forest Service (4(e) condition 21), staff	$22,000	$0	$2,230
19. Improve bypassed reach access trail outside the project boundary (REC-8(b))	MOA Parties, Forest Service (4(e) condition 21), staff	$30,000	$0	$3,050
20. Provide whitewater boating flows in the bypassed reach (REC-9)	MOA Parties, Forest Service (4(e) condition 21), staff	$10,000	$4,000	$5,010

21. Develop a recreation plan to include: (1) operation and management procedures for the project recreation site; (2) conceptual drawings and descriptions of the proposed and recommended project recreation improvements which include: (a) installation of a permanent vault toilet that is accessible to persons with disabilities; (b) construction of a new picnic site (or modification of the existing site) in consultation with the Forest Service, that is accessible to persons with disabilities; (c) maintenance and repaving of the recreation site access road and asphalt path; (d) reconfiguration of the former sandbox play area fencing; (e) construction of steps for improving access to the existing dirt river access trail at the west end of the recreation site; (f) improvements to the user-created informal river access trail; and (g) improved interpretive signage that includes dog waste protocols and river flow information; (3) a schedule for maintaining those improvements; (4) revised Exhibit G drawings identifying all of the above improvements as project recreational	Staff	$5,000	$0	$510

Environmental/Mitigation Measures	Entities	Capital Cost (2019$)	Annual Cost (2019$)[a]	Levelized Annual Cost[a] (2019$)
facilities; and (5) information regarding the publicly-accessible website for bypassed reach flow information				
22. Develop a release plan for the proposed whitewater boating flows	Staff	$5,000	$0	$510
23. Coordinate regarding REC-2, REC-5, REC-8, and REC-9 with Forest Service, MOA Parties, and Utah DOT	Forest Service (4(e) condition 13(b)), staff	$0	$0	$0
Land Use Resources				
24. Develop a fire prevention and response plan	Forest Service (4(e) condition 20), staff	$4,000	$0	$410
Cultural Resources				
25. Implement revised HPMP (CULT-1)	MOA Parties, Forest Service (4(e) condition 21), staff	$6,000	$400	$1,010

[a] All capital and annual costs are converted to equal annual costs over a 30-year period to give a uniform basis for comparing costs.

5.0 CONCLUSIONS AND RECOMMENDATIONS

5.1 COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE

Sections 4(e) and 10(a) of the FPA require the Commission to give equal consideration to the power development purposes and to the purposes of energy conservation; the protection, mitigation of damage to, and enhancement of fish and wildlife; the protection of recreational opportunities; and the preservation of other aspects of environmental quality. Any licenses issued shall be such as in the Commission's judgment will be best adapted to a comprehensive plan for improving or developing waterway or waterways for all beneficial public uses. This section contains the basis for, and a summary of, our recommendations for relicensing the project. We weigh the costs and benefits of our recommended alternative against other proposed measures.

Based on our independent review of agency comments filed on these projects and our review the environmental and economic effects of the proposed project and economic effects of the project and its alternatives, we selected the staff alternative as the preferred alternative. We recommend the staff alternative because: (1) issuing a new license for the project would allow PacifiCorp to operate the project as a beneficial and dependable source of electrical energy; (2) the 3,850 kW of electric capacity comes from a renewable resource that does not contribute to atmospheric pollution, including greenhouse gases; (3) the public benefits of the staff alternative would exceed those of the no-action alternative; and (4) the proposed and recommended measures would protect and enhance water, aquatic, botanical, terrestrial, land use, and cultural resources, and improve recreation opportunities at the project.

In the following section, we make recommendations as to which environmental measures proposed by PacifiCorp or recommended by agencies or other entities should be included in any new license issued for the project. In addition to PacifiCorp's proposed environmental measures, we recommend additional environmental measures to be included in any new license issued for the project.

5.1.1 Measures Proposed by PacifiCorp

Based on our environmental analysis of PacifiCorp's proposal in section 3, and the costs presented in section 4, we conclude that the following environmental measures proposed by PacifiCorp would protect and enhance environmental resources and would be worth the cost. Therefore, we recommend including these measures in any license issued for the project:

- Continue to provide a minimum flow to the bypassed reach of 34 cfs or inflow, whichever is less, from October 1 to March 31, and 34-50 cfs (flow determined annually based on the Weber River runoff forecast from NRCS), or inflow, whichever is less, from April 1 to September 30 (HYD-1 and FISH-1).
- Construct, operate, and maintain a fish ladder suitable for upstream passage of both Bonneville cutthroat trout (BCT) and bluehead sucker, including a fish trap (FISH-2).[19]
- Develop a fish passage consultation and communication plan that includes provisions for annual consultation with certain MOA parties with fishery-related interest regarding the operation of the fish ladder and trap (FISH-2).
- Maintain a full forebay during prolonged project outages, as operational constraints and winter icing conditions allow, to ensure fish ladder operation and effective upstream fish passage (FISH-4); operate the low-level gate when the forebay is dewatered and the fish ladder is inoperable during winter low-flow conditions or during project maintenance to provide upstream fish passage (FISH-3); re-open the low-level gate as soon as possible in an effort to restore upstream fish passage when the fish ladder and the low-level gate are inoperable for more than 10 days, and consult with certain MOA parties with fishery-related interest using the protocols defined in the proposed Communication Plan to discuss interim fish passage options (FISH 3 and 4).
- Continue annual consultation with the Forest Service to discuss any planned project operation and maintenance activities that could affect botanical and wildlife resources to determine if additional protective measures are necessary (BOT-1 and WL-1).
- Implement measures to minimize the introduction and spread of non-native, invasive weed species and revegetate areas where any ground-disturbance would occur as a result of proposed trail improvements, fish ladder construction, and other project-related activities, as needed (BOT-2).
- Continue to maintain the existing project recreation site, but with modifications outlined below in REC-2 through REC-8 (REC-1).
- Install signage at the recreation site instructing visitors on dog waste protocols and provide dog waste bags for disposal (REC-2).
- Create a webpage that provides real-time, approximate bypassed reach flow information, and include a scannable code, that links to the flow information

[19] PacifiCorp states that the fish trap would be operated by third parties (i.e., Utah DWR and Trout Unlimited). However, while a licensee may hire a third party to operate its licensed facilities, the licensee is ultimately responsible for its operation.

webpage, on improved interpretive signage at the project recreation site (REC-3).

- Install and maintain a year-round permanent vault toilet facility at the project recreation site that is accessible to persons with disabilities (REC-4).
- Construct a new picnic site on the open grass area closest to parking lot (consisting of a concrete pad, a grill, and a picnic table), or modify an existing site per Forest Service standards that is accessible to persons with disabilities (REC-5).
- Repave the access road and asphalt path at the project recreation site (REC-6).
- Remove fencing along the south, east, and west portions of the former sandbox play area (retain the north portion to partition recreation site from I-84 freeway) (REC-7).
- Improve the existing user-created river access trail at the west end of the recreation site within the project boundary (REC-8).
- Annually provide whitewater boating flow releases to the bypassed reach, by curtailing generation (up to 320 cfs, or inflow), for 4-hour periods on four Saturdays prior to July 15, and construct a take-out/portage which would include steps, signage, and hazard mitigation, if: (1) American Whitewater can identify a safe and legal location for the take-out/portage; (2) Forest Service and DWCCC agree to review the proposed location and PacifiCorp's proposed facilities for the location; and (3) Forest Service agrees that the proposed location is appropriate for public access and use (REC-9).
- Implement the HPMP that was filed on May 18, 2018 (CULT-1).

5.1.2 Additional Measures Recommended by Staff

In addition to PacifiCorp's proposed measures noted above, we recommend the following additional measures:

- Develop an operation compliance monitoring plan for monitoring compliance with the operating requirements of any new license issued for the project (e.g., run-of-river, minimum flows, impoundment levels, and regulating flow through the dam to enhance upstream and downstream fish passage).
- Develop an upstream fish passage plan that includes: (1) detailed, final design drawings of the fish ladder to be constructed at the project; (2) a construction schedule and description of construction methods and procedures; (3) detailed descriptions of fish ladder operation and maintenance; and (4) a description of methods to conduct a one-year

effectiveness evaluation of the new fish ladder to ensure that the fish ladder is generally operating as designed, and if not, make minor adjustments to the facility and operation.

- Develop a recreation plan that includes: (1) operation and management procedures for the project recreation site; (2) conceptual drawings and descriptions of the proposed and recommended project recreation improvements which include the proposed and recommended: (a) installation of a permanent vault toilet that is accessible to persons with disabilities; (b) construction of a new picnic site (or modification of the existing site) in consultation with the Forest Service, that is accessible to persons with disabilities; (c) maintenance and repaving of the recreation site access road and asphalt path; (d) reconfiguration of the former sandbox play area fencing; (e) construction of steps for improving access to the existing dirt river access trail at the west end of the recreation site; (f) improvements to the user-created informal river access trail; and (g) improved interpretive signage that includes dog waste protocols and river flow information; (3) a schedule for maintaining the year-round permanent vault toilet, the paved access road and asphalt path, the new (or modified) picnic site and other picnic sites, the fishing platform, the interpretive signage, the former sandbox play area fencing, the existing dirt river access trail at the west end of the recreation site, and the user-created informal river access trail that extends west beyond the recreation site; (4) revised Exhibit G drawings identifying all of the above as project recreational facilities; and (5) information regarding the creation and maintenance of a publicly-accessible webpage, hosted and maintained by PacifiCorp, for indicating approximate flows in the bypassed reach.
- Develop a release plan for the proposed whitewater boating flows that details protocols for releasing proposed whitewater flows according to the outcomes of consultation activities with interested parties and agencies and the results of evaluations of each previous year's scheduled releases.
- Modify the project boundary to incorporate the user-created informal river access trail extending west from the project recreation site to no further than the Utah DOT right-of-way of the eastbound lanes of I-84 freeway overpass as a project facility and implement improvements to the trail to create a navigable path with minimal width.
- Develop a fire prevention and response plan that includes provisions for the prevention, reporting, and emergency response to fires in the vicinity of the project resulting from project operations.

Below, we discuss the rationale for our additional staff-recommended measures, and modifications to the proposed measures.

Operation Compliance Monitoring

PacifiCorp proposes to continue to operate the project in run-of-river mode and release a continuous minimum stream flow of 34 cfs or inflow, whichever is less, from October 1 to March 31; and a continuous minimum flow of 34 to 50 cfs (range dependent on the annual runoff forecast), or inflow, whichever is less, from April 1 to September 30. Minimum flow release to the bypassed reach is currently achieved via the existing ice chute, controlled with a slide gate at the upstream end. Once the proposed fish ladder is operational, a portion of the minimum flow would be passed through the fish ladder to act as attraction flow. The remainder of the flow would continue to be passed through the existing minimum flow ice chute gate. PacifiCorp also proposes to keep the low-level gate operational when the forebay is dewatered for project maintenance to provide an alternate route for upstream fish passage until the forebay fills and the fish ladder is operational. If the forebay is dewatered and the low-level gate is inoperable for more than 10 days due to extreme temperature or flow conditions, PacifiCorp proposes to consult with certain MOA parties with fishery-related interests (per the Communication Plan) and open the low-level gate as soon as possible.

PacifiCorp does not specify how it would monitor compliance with its minimum flow regime and run-of-river operation, or how it would report deviations from the operating requirements of the license to the Commission. With construction and operation of a new fish ladder, PacifiCorp would change how the minimum flows would be released to the bypassed reach and would modify gate operations to discharge water under varying river flow and project operating conditions. Developing a formal project operation compliance monitoring plan would provide a mechanism for reporting operational data and deviations, facilitate administration of the license, and ensure protection of resources in the impoundment and downstream of the dam. Additionally, developing such a plan would ensure that the minimum flows required in any new license issued for the Weber Project are met and monitored effectively. Therefore, we recommend that PacifiCorp develop an operation compliance monitoring plan that includes provisions for: (1) monitoring compliance with run-of-river operation, minimum flows, impoundment levels, and the regulation of flows passed through the dam to protect upstream and downstream migrating fish; and (2) reporting operational data and deviations from operational requirements to the Commission.

We estimate that the annual levelized cost of developing an operation and compliance monitoring plan would be $390, ($5000 capital cost) and conclude that the compliance benefits outweigh the cost.

Upstream Fish Passage

While PacifiCorp provides a conceptual design for the fish ladder in the FLA, it does not propose a process for developing the detailed final design in consultation with the resource agencies. Given that the final detailed design likely would be modified somewhat from the conceptual designs, developing protocols for fish ladder and fish trap operation and maintenance based on the final detail design, would ensure that it is designed and operated to provide upstream passage for Bonneville cutthroat trout and bluehead sucker.

A total of 0.16 acre of earthmoving and construction activities are planned for fish ladder construction to be located adjacent to the project recreation site. PacifiCorp proposes to implement erosion control measures and other BMPs during construction; however, PacifiCorp only provides a general description of methods proposed for constructing the fish ladder and few details concerning BMPs to reduce construction effects on the aquatic resources. Developing more detailed methods and procedures for constructing the fish ladder in consultation with the resource agencies would ensure that any construction effects are minimized. These details should at a minimum include: (1) pollution prevention measures; (2) hazardous materials management; (3) spoils management; (4) protocols for communication; (5) coordination related to construction materials deliveries and construction-related traffic; (6) maintaining public, pedestrian access during periods when construction activities would not occur; and (7) specific BMPs, which would be necessary to minimize anticipated adverse effects on aquatic resources in the Weber River and public access and recreational use at the project recreation site.

PacifiCorp anticipates construction of the fish ladder and trap would take approximately 9 months, would result in temporary closure of the project recreation site, and would be completed within a single in-water work period. They state that ideally construction would occur during the lowest flow portion of the year, from October through December. While these conditions are targeted to support fish ladder construction, the necessary 9-month duration of construction activities would require work outside of the ideal low-flow time period. PacifiCorp does not provide a detailed schedule when construction would begin, when it would be completed, and when the fish ladder would become operational. Developing a detailed construction schedule that adheres to Utah DEQ's 401 condition 1 requiring fish ladder construction to occur outside of the February to June time period and is based on better defined parameters, such as final detailed designs, site-specific construction characteristics, and anticipated Weber River flows, would minimize any potential construction effects on aquatic and recreation resources.

While we fully expect that the detailed final design developed in consultation with the resource agencies would function properly, developing a methodology to conduct an

effectiveness evaluation of the new fish ladder following its first year of operation would allow PacifiCorp time to make minor adjustments to the fish ladder to ensure that it performs as designed prior to placing it into permanent operation.

Therefore, we recommend that PacifiCorp develop an upstream fish passage plan that includes: (1) detailed, final design drawings of the fish ladder to be constructed at the project; (2) a construction schedule and description of construction methods and procedures; (3) detailed descriptions of fish ladder and fish trap operation and maintenance; and (4) a description of methods to conduct a one-year effectiveness evaluation of the new fish ladder to ensure that the fish ladder is generally operating as designed, and if not, make minor adjustments to the facility and operation. We estimate that the levelized annual cost of consulting and developing the upstream fish passage plan would be $5,000 ($50,000 capital cost) and conclude that the benefits of the measure outweigh the cost.

Recreation Improvements

As discussed in section 3.3.5.2, *Recreation, Environmental Effects*, PacifiCorp's proposed recreation site improvements would enhance visitor satisfaction by improving accessibility, aesthetics, and availability of bypassed reach flow information. However, PacifiCorp does not propose to include the improved user-created informal river access trail as a project facility and instead proposes to conduct the improvement through an off-license agreement with Trout Unlimited. As part of the off-license agreement, PacifiCorp would include the O&M costs for the trail in the annual O&M costs for the project; however, Trout Unlimited would be able to use the capital costs provided through the agreement to provide other, unspecified habitat benefits within the watershed if the trail improvements are not feasible, or that improvements require less money than what is budgeted for the agreement.

This non-project trail is an important public access route for all river recreation users. As discussed in section 3.3.6.2, *Land Use and Aesthetic Resources*, *Environmental Effects*, modifying the project boundary to include the user-created informal river access trail would provide formal access to the bypassed reach on an already widely-used, non-project river access route. The alignment of the trail should be determined in coordination with the Forest Service, and in consultation with Utah DOT, and should extend no further than the right-of-way of the eastbound lanes of the I-84 freeway overpass. By incorporating the trail into the project boundary as a project facility, PacifiCorp would be responsible for maintaining the trail; however, another entity, such as Trout Unlimited, could provide maintenance work on the trail as part of an off-license agreement with PacifiCorp. Staff's recommendation to improve the user-created informal river access trail and incorporate it into the project boundary would have no additional associated cost.

PacifiCorp does not include details of its proposed recreation improvements, such as comprehensive descriptions of the improvements and provisions for maintaining them upon completion. Developing a recreation plan that provides such details would ensure that the improvements are implemented and maintained appropriately. The recreation plan should, at a minimum, include: (1) operation and management procedures for the project recreation site; (2) conceptual drawings and descriptions of the proposed and recommended project recreation improvements which include: (a) installation of a permanent vault toilet that is accessible to persons with disabilities; (b) construction of a new picnic site (or modification of the existing site) in consultation with the Forest Service, that is accessible to persons with disabilities; (c) maintenance and repaving of the recreation site access road and asphalt path; (d) reconfiguration of the former sandbox play area fencing; (e) construction of steps for improving access to the existing dirt river access trail at the west end of the recreation site; (f) improvements to the user-created informal river access trail; and (g) improved interpretive signage that includes dog waste protocols and river flow information; (3) a schedule for maintaining the existing, proposed, and recommended project recreation site facilities and the user-created informal river access trail that extends west beyond the recreation site; (4) revised Exhibit G drawings identifying all of the above as project recreational facilities; and (5) information regarding the creation and maintenance of a publicly-accessible webpage for indicating approximate flows in the bypassed reach. The plan should also provide additional details describing PacifiCorp's proposed recreational measures, including: (1) the content and placement of the informational signage; (2) the design and placement of the year-round permanent vault toilet and of the new, or modified, picnic site; (3) the plan for removal of the former sandbox play area fencing; (4) the plan for repaving the recreation site access road and asphalt path; and (5) the designs for improvements to both bypassed reach access trails. Additionally, the plan should include a provision for consultation with the MOA parties with recreation-related interest for coordination related to recreational resources and the proposed improvements, as required by 4(e) condition 13.

Therefore, we recommend PacifiCorp develop a recreation plan that includes the provisions detailed above. We estimate that the levelized annual cost of developing the plan would be $510 ($5,000 capital cost) and that the benefits of the plan to include staff's recommendations, as well as provisions for improving and maintaining the user-created informal river access trail, outweigh the cost.

Whitewater Boating Flow Release Plan

PacifiCorp proposes to release a series of whitewater boating flows contingent that American Whitewater identifies and proposes a safe and legal whitewater boating take-out/portage location, Forest Service accepts the proposal, and Forest Service and DWCCC agree to the take-out/portage location. PacifiCorp would provide boatable

flows to the bypassed reach by curtailing generation (up to 320 cfs, or inflow) for 4-hour segments, on four Saturdays prior to July 15, annually.

Based on our analysis in section 3.3.5.2, in the subsection *Whitewater Boating Flow Release Plan*, the lack of available boatable flows constrains whitewater boating use in the bypassed reach. PacifiCorp's proposal to provide scheduled whitewater boating flow releases would address the project's current effects on the availability of whitewater boating flows in the bypassed reach and would benefit whitewater boaters by providing a total of 16 scheduled hours of additional boatable flows per year.

Many factors (e.g., time of year, flow levels, public access) contribute to providing a successful flow release program. In order to account for these factors and plan appropriately, PacifiCorp should develop a whitewater boating flow release plan that details protocols for releasing its proposed whitewater flows and includes, at a minimum, the following provisions: (1) consultation and coordination with interested parties and agencies, after each year of releases, regarding river access, flow schedule, instream flows, or changes to implementation of the boating flow release regime as a result of changes in participation levels; (2) convene a meeting with the interested parties and agencies after the first three years of releases to evaluate the implementation of the plan, and if revisions to the plan are necessary as a result of this consultation, submit a revised plan for Commission approval; (3) convene a meeting, every six years following the initial three years of post-release evaluation meetings, to discuss any changes to the plan that may have occurred or may be necessary since the previous evaluation period. PacifiCorp should submit a report following each meeting, to the interested parties and to the Commission, that summarizes the consultation and includes recommendations, if any, that would result in changes to the whitewater boating flow release plan.

Therefore, we recommend PacifiCorp develop a release plan for the proposed whitewater boating flows in accordance with proposed measure REC-9 and include a description and protocols for monitoring and reporting use during each of the four annual scheduled flow release events. We estimate that the levelized annual cost of developing the plan would be $5,000 and that the benefits of this plan to enhance whitewater boating opportunities outweigh the cost.

Fire Prevention and Response Plan

Project construction, and continued operation and maintenance, including recreational use (i.e. picnic site grills), increase potential for wildland fire occurrence. PacifiCorp does not propose any measures related to fire prevention. Forest Service 4(e) condition 20 specifies PacifiCorp to develop a fire prevention and response plan in consultation with the Forest Service. The plan would detail PacifiCorp's responsibility to: (1) identify hazard reduction and recurring maintenance measures in order to prevent the spread of fire outside of the project boundary, (2) address fire hazard and public

safety associated with public recreation use and access of the project facilities, (3) report any project-related fire immediately to the Forest Service, (4) analyze fire prevention and suppression equipment and personnel, and advise Forest Service of the locations and availability of those resources.

As discussed in section 3.3.6.2, *Land Use and Aesthetic Resources*, *Environmental Effects*, project operation and maintenance, including recreational use, increase the potential of wildland fire occurrence. Developing a fire prevention and response plan, as required by Forest Service, would help prevent and minimize potential project-related fires from spreading beyond project lands, and would aid Forest Service personnel if a fire were to move beyond the project boundary. Implementing the plan would also reduce the effects of project-induced fire, which would protect PacifiCorp's hydropower assets and the environmental resources and non-project facilities and infrastructure on or adjacent to project lands.

Therefore, we recommend that PacifiCorp develop the plan. We estimate that the levelized annual cost of developing the plan would be $410 ($4,000 capital cost) and conclude the protections to environmental resources and public safety would be worth the cost.

5.1.3 Other Measures Not Recommended by Staff

Annual Consultation

Forest Service final 4(e) condition 21 requires PacifiCorp to implement its proposed conditions identified in the signed MOA regarding PM&E measures at the project. The proposed conditions include that PacifiCorp would continue to annually consult with the Forest Service concerning botanical and terrestrial resources. The proposed measure also includes consultation before planned project maintenance or operational measures that would require ground-disturbing activities that could affect botanical and terrestrial resources.

Forest Service final 4(e) condition 13 would require PacifiCorp to annually consult with the Forest Service, interested MOA signatories, and other stakeholders to discuss various administrative matters as well as: (1) potential protection measures for species that are newly listed (or delisted) as threatened, endangered, or sensitive; (2) whether employee site-awareness training is needed to address site-specific resource issues; (3) newly discovered cultural resource sites; and (4) fish ladder passage, operations for passage, and fishway issues and outages. In addition, Forest Service final 4(e) condition 18 similarly requires that PacifiCorp consult on any issues relating to special-status species and sensitive areas, consistent with the consultation groups described in condition 13.

As indicated in section 3.3.3 *Terrestrial Resources, Environmental Effects*, while not a specific measure to protect botanical and terrestrial resources including special-status and federally listed species and sensitive areas, annual consultation with the Forest Service and other MOA signatories could potentially help protect such resources over the term of the license. However, we see no specific project-related purpose that would be served by requiring a generic provision for ongoing consultations and review in order to ensure compliance with license conditions or ESA and other applicable environmental statutes. If ESA issues arise during the term of the license, either based on new listings or availability of new information, post-licensing procedures developed by the Commission and resource agencies (FERC et al., 2000) provide a framework for identifying issues, information gaps, and the need for additional protection measures. Any license issued would contain a fish and wildlife reopener article that could be used to require changes to project facilities or operations upon Commission motion, or as recommended by the state or federal fish and wildlife agencies, after notice and opportunity for hearing. This standard reopener retains authority for the Commission to implement any measures that may be needed to protect threatened or endangered species or other fish and wildlife resources over the term of the license.

Condition 13 also requires that PacifiCorp annually consult with Forest Service to determine whether employee site-awareness training is needed to address site-specific resource issues, and to discuss needed protection measures for newly discovered cultural resource sites. While such training could benefit environmental resources, PacifiCorp is expected to train their employees to the extent needed to maintain compliance with any license conditions, and therefore such consultation is unnecessary. Additionally, the associated HPMP for this project provides adequate procedures for addressing any newly discovered cultural resource sites over the term of the new license, and therefore annual discussions regarding protection measures for newly discovered sites is not necessary.

PacifiCorp proposes to consult annually with certain MOA parties with fishery-related interest regarding fish ladder and trap operation and maintenance according to a Communication Plan. Forest Service 4(e) condition 13 requires PacifiCorp to annually consult with resource agencies and other interested parties on fish ladder passage, operations for passage, and fishway issues and outages. PacifiCorp and Forest Service do not identify a specific need or benefit of consulting annually with the resource agencies on fish ladder and trap operation and maintenance. PacifiCorp would operate and maintain the fish ladder and trap by following specific operation and maintenance guidelines described within the Upstream Fish Passage Plan that are developed in consultation with the resource agencies and approved by the Commission. With proper operation, maintenance, and the recommended short-term evaluation discussed above, there is no reason to believe that the fish ladder and trap would not perform as designed. Thus, there would be no benefit to consulting annually. However, because the Forest Service 4(e) condition is mandatory, annual consultation on the fish ladder and trap would be made a requirement of the license.

Therefore, we do not recommend incorporating the consultation measures discussed above as part of any license issued for the project. We find the benefits of annual consultation are not worth the estimated levelized annual cost of $2,500. However, we recognize these measures are included in Forest Service final 4(e) conditions 13a, 18, and 21, and therefore would be included as mandatory conditions in any license issued for the project.

5.2 UNAVOIDABLE ADVERSE EFFECTS

Minor disturbance to terrestrial species, aquatic species, and project recreation site use and bypassed reach use, caused by noise and movement from increased human, equipment, and vehicular activity would occur as a result of temporary construction activities occurring at the fish ladder construction site, and as a result of temporary construction activities related to project recreation resources improvements.

5.3 SUMMARY OF FOREST SERVICE'S SECTION 4(e) CONDITIONS

In section 2.2.5, *Modifications to Applicant's Proposal—Mandatory Conditions*, we list the final 4(e) conditions submitted by the Forest Service, and note that section 4(e) of the FPA provides that any license issued by the Commission "for a project within a federal reservation shall be subject to and contain such conditions as the Secretary of the responsible federal land management agency deems necessary for the adequate protection and use of the reservation." Thus, any 4(e) condition that meets the requirements of the law must be included in any license issued by the Commission, regardless of whether we include the condition in our Staff Alternative.

Of the Forest Service's 21 final conditions, we consider 13 of the conditions (conditions 1 through 10, 12, parts of 13, and 14 through 16) to be administrative or legal in nature and not specific environmental measures. We therefore, do not analyze these conditions in this EA. Table 18 summarizes our conclusions with respect to the eight final 4(e) conditions that we consider to be environmental measures. We include in the Staff Alternative seven conditions as specified by the agency and modify one condition to include the staff recommendation to incorporate the user-created informal river access trail as project facility.

Table 18. Forest Service's final section 4(e) conditions for the Weber Hydroelectric Project (Source: staff).

Condition	**Annualized Cost**	**Adopted in staff alternative?**
Implement the Hazardous Materials Management Plan for locations on NFS lands (condition 11)	$300	Yes
Annual consultation on new sensitive species, and federally listed and delisted species under ESA; newly discovered cultural resource sites; employee site-awareness training; and fish ladder passage, operations for passage, and fishway issues and outages (condition 13a).	$2,500	In part. We recommend consultation necessary for implementation of REC-9.
Recreation resources coordination with Forest Service, Utah DWR, Trout Unlimited, Utah DWQ, FWS, American Whitewater, and Utah DOT, as agreed to in the MOA, for PacifiCorp's PM&E measures REC-2, REC-5, REC-8, and REC-9 (condition 13b)	$0	Yes
Invasive species management (condition 17)	$0	Yes
Special-status species and sensitive areas (condition 18)	$0	No
Implement the Erosion and Sediment Control Plan for locations, on, or directly affecting, NFS lands (condition 19)	$300	Yes
Implement the Fire Prevention and Response Plan for locations, on, or directly affecting, NFS lands (condition 20)	$410	Yes

Condition	Annualized Cost	Adopted in staff alternative?
Implement the MOA (condition 21)	$0	Partially. We recommend that the trail (REC-8(b)) be included as a formal project facility and that all funds allocated as capital cost be used for the sole purpose of improving the trail (*see* section 5.1.2).

5.4 CONSISTENCY WITH COMPREHENSIVE PLANS

Section 10(a)(2) of the FPA, 16 U.S.C.§ 803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. We reviewed 4 comprehensive plans that are applicable to the Weber Hydroelectric Project, located in Utah. No inconsistencies were found.

Forest Service. 2003. Wasatch-Cache National Forest land and resource management plan. Department of Agriculture, Salt Lake City, Utah. March 2003.

National Park Service. The Nationwide Rivers Inventory. Department of the Interior, Washington, D.C. 1993.

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.

Utah Department of Natural Resources. Utah Statewide Comprehensive Outdoor Recreation Plan (SCORP): 2009. Salt Lake City, Utah.

6.0 FINDING OF NO SIGNIFICANT IMPACT

If the project is relicensed with the additional staff-recommended measures, the project would operate while providing protective measures to aquatic, terrestrial, and recreational resources, and any unidentified cultural or historic resources in the project area.

Based on our independent analysis, issuance of a subsequent license for the project, as proposed with the additional staff-recommended measures, would not constitute a major federal action significantly affecting the quality of the human environment.

7.0 LITERATURE CITED

Aedo, J., Belk, M., and R. Hotchkiss. 2009. *Morphology and Swimming Performance of Utah Fishes: Critical Information for Culvert Design in Utah Streams.* Report No. UT-09.12. Prepared by Brigham Young University. Prepared for Utah Department of Transportation Research Division.

Andreasen, J.K., and J.R. Barnes. 1975. *Reproductive Life History of Catostomus ardens and C. discobolus in the Weber River, Utah*. Copeia. 4:643-648.

Avian Power Line Interaction Committee (APLIC). 2012. Reducing avian collisions with power lines: The state of the art in 2012. Edison Electric Institute and Avian Power Line Interaction Committee, Washington, D.C.

APLIC. 2006. Suggested practices for avian protection on power lines: The state of the art in 2006. Edison Electric Institute, APLIC, and the California Energy Commission. Washington, D.C., and Sacramento, CA.

Barrett, J. C., G. D. Grossman, and J. Rosenfeld. 1992. Turbidity-induced changes in reactive distance of rainbow trout. Transactions of the American Fisheries Society 121:437–443.

Behke, R.J. 1992. Native trout of western North America. American Fisheries Society Monograph 6. 275 pp.

Behnke, R. J.; Zarn, Mark. 1976. Biology and management of threatened and endangered western trouts. Gen. Tech. Rep. RM-28. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 45 p.

Bower, M.R., Hubert, W.J., and F.J. Rahel. 2008. *Habitat Features Affect Bluehead Sucker, Flannelmouth Sucker, and Rountail Chub across a Headwater Tributary System in the Colorado River Basin*. Journal of Freshwater Ecology. 23:347- 358.

Bryant, B., 1984, as cited in Lowe et al. 2003. *Reconnaissance geologic map of the Precambrian Farmington Canyon Complex and surrounding rocks between Ogden and Bountiful, Utah.* U.S. Geological Survey Miscellaneous Geologic Investigations Series Map 1-1447.

Budy et al. 2014. Budy, P., Thiede, G.P., McKell, M.D., and P. Thompson. 2014. *Weber River Metapopulation and Source-Sink Dynamics of Native Trout and Nongame Fishes*. 2013 Performance Report to Utah Division of Wildlife Resources. Sport Fish Restoration, Grant Number: F-135-R, Segment 2.

UTCFWRU 2014(4):1-54.

Christenson and Shaw. 2008a. Available at: http://ugspub.nr.utah.gov/publications/circular/c-106/c-106landslides.pdf Accessed June 13, 2017.

Christenson and Shaw. 2008b. Available at: http://ugspub.nr.utah.gov/publications/circular/c-106/c-106debrisflows.pdf Accessed June 13, 2017.

Cirrus Ecological Solutions. 2017. Final Recreation Technical Report. Weber Hydroelectric Project Relicensing. FERC Project No. 1744. June 30, 2017.

Deas, M. L. and G. T. Orlob. 1999. Klamath River modeling project. Project #96−HP−01. Assessment of alternatives for flow and water quality control in the Klamath River below Iron Gate Dam. University of California Davis center for environmental and water resources engineering. Report No. 99−04.

Douglas, M.R., and M.E. Douglas. 2009. Population Genetic Analysis of Bluehead Sucker [Catostomus (Pantosteus) discobolus] Across the Species' Range. Draft Final Report. Illinois Natural History Survey. Champaign, IL.

ERM-West, Inc. 2016. Whitewater Recreation Study Technical Report. Prepared for: PacifiCorp, Salt Lake City, Utah. Prepared by: ERM-West, Inc. Bigfork, Montana. August 2016.

Gordon, J.L. 2003. Turbine Selection for Small Low-Head Hydro Developments. Presentation at "Innovative Small Hydro Technologies", Waterpower XIII, Buffalo, NY. July 29, 2003. http://smallhydro.carbonsd.com/pdf/workshops/cd/2003/technical/Turbine%20selection% 20for%20small%20low%20head%20hydro.doc

Federal Register. 2008. Endangered and Threatened Wildlife and Plants; 12-Month Finding on a Petition to List the Bonneville Cutthroat Trout as Threatened or Endangered. Proposed Ruling by U.S. Fish and Wildlife Service. 73 FR 52235. Issued September 9, 2008.

FERC, U.S. Department of the Interior, U.S. Department of Commerce, U.S. Department of Agriculture, Environmental Protection Agency, and Advisory Council on Historic Preservation. 2000. Interagency task force report on improving coordination of ESA section 7 consultation with the FERC licensing process. December 8, 2000.

Franke G.F., Mathur, D., Hopping, P.N., Headrick, M.R., and Y. Ventikos. 1997.

Development of Environmentally Advanced Hydropower Turbine System Design Concepts. Idaho National Engineering and Environmental Laboratory. Prepared for U.S. Department of Energy, Energy Efficiency and Renewable Energy and Hydropower Research Foundation, Inc. Contract No. DE-AC07-94ID13223. Idaho Falls, ID. 456 pp.

Fertig, W., R. Black, and P. Wolken. 2005. Rangewide Status Review of Ute Ladies'-tresses (Spiranthes diluvialis). Prepared for the U.S. Fish and Wildlife Service and Central Utah Water Conservancy District. Available online at: https://www.fws.gov/mountain-prairie/es/uteLadiestress.php

Hopken, M.W., M. R. Douglas, and M. E. Douglas. 2013. Stream hierarchy defines riverscape genetics of a North American desert fish. Molecular Ecology.

Lechert, S. and L. Krussow. Final Cultural Resources Technical Report, Weber Hydroelectric Project Relicensing, FERC Project No. 1744. SWCA Environmental Consultants, Salt Lake City.

Lentsch, L., Toline, C.A., Kershner, J., Hudson, J.M., and J. Mizzi. 2000. Range-wide Conservation Agreement and Strategy for Bonneville Cutthroat (Oncorhynchus clarki utah). Publication No. 00-19. Utah Division of Wildlife Resources. Salt Lake City, UT. 90 pp. of Land Management. 2009. Northeastern Great Basin Standards and Guidelines Assessment--Deeth (Southern Portion) and the Pole Creek Allotment. Elko District, Wells Field Office. 80 pp.

Lowe, M, H.A. Hurlow, and M. Matyjasik. 2003. *The Weber River basin aquifer storage and recovery project.* Open File Report 419, Utah Geological Survey, Salt Lake City, UT.

Lowry, J.H, Jr. et al. 2007. *Land cover classification and mapping* (Chapter 2). In Southwest Regional Gap Analysis Final Report, edited by J.S. Prior-Magee, et al. Moscow, Idaho: Gap Analysis Program.

PacifiCorp. 2015. Weber Hydroelectric Project FERC No. 1744 Pre-Application Document. PacifiCorp Hydro Resources. Salt Lake City, UT. May 29, 2015.

PacifiCorp. 2016. Weber Hydroelectric Project FERC No. 1744 Water Resources Study Plan. PacifiCorp Hydro Resources. Salt Lake City, UT. March 2016.

PacifiCorp. 2017. Weber Hydroelectric Project FERC No. 1744. Final Technical Reports. PacifiCorp Hydro Resources. Salt Lake City, UT. June 30, 2017.

PacifiCorp. 2018a. Weber Hydroelectric Project FERC No. 1744. Final Application for New License. PacifiCorp Hydro Resources. Salt Lake City, Utah. May 2018.

PacifiCorp. 2018b. Weber Hydroelectric Project FERC No. 1744. Response to June 28, 2018 Request for Additional Information. PacifiCorp Hydro Resources. Salt Lake City, Utah. September 2018.

Ptacek, J.A., Rees, D.E., and W.J. Miller. 2005. *Bluehead Sucker (Catostomus discobolus): A Technical Conservation Assessment*. USDA Forest Service, Rocky Mountain Region. Available Online: http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5206794.pdf.

Redding, J. M., C. B. Schreck, and F. H. Everest. 1987. Physiological effects on coho salmon and steelhead of exposure to suspended solids. Transactions of the American Fisheries Society 116:737–744.

Sigler, W.F., and J.W. Sigler. 1987. Fishes of the Great Basin: A Natural History. University of Nevada Press. Reno, NV.

Sigler, W.F., and J.W. Sigler. 1996. *Fishes of Utah.* University of Utah Press, Salt Lake City, UT.

Sweet, D.E., and W.A. Hubert. 2010. *Seasonal Movements of Native and Introduced Catostomids in the Big Sandy River, Wyoming*. The Southwestern Naturalist. 55(3):382-389.

SWCA Environmental Consultants (SWCA). 2017b. Weber Hydroelectric Project Terrestrial, Threatened, Endangered, and Sensitive Species and Noxious Weeds Technical Report. SWCA Environmental Consultants. June 30, 2017.

Thompson, P., pers. comm. Personal communication with Paul Thompson, Aquatics Program Manager, Northern Region, Utah Division of Wildlife Resources. Email to Frank Shrier, PacifiCorp Fisheries Biologist, March 10, 2015.

Thompson, P. 2015. *Bonneville Cutthroat Trout and Bluehead Sucker in the Weber River: Endangered Species Act Implications?* Weber River Partnership Native Species Presentation. Available online: http://www.slideshare.net/PaulThompson47/weber-riverpartnership-native-species-presentation.

Utah. 2013. Conservation Plan for Greater Sage-grouse in Utah. Available at: http://wildlife.utah.gov/uplandgame/sage_grouse/pdf/greater_sage_grouse_plan.pdf.

Utah Department of Natural Resources (Utah DNR). 2006a. Conservation and management plan for three fish species in Utah. Available at: http://wildlife.utah.gov/pdf/UTconPlan_Roundtail_BlueH_FlannelS_2009.pdf Accessed: May 28, 2015.

Utah DNR. 2006b. Range-wide conservation agreement and strategy for roundtail chub, bluehead sucker, and flannelmouth sucker. Available at: http://wildlife.utah.gov/pdf/UT_conservation_plan_5-11-07.pdf Accessed: May 28, 2015.

Utah DNR. 2015. Utah Conservation Data Center. Available at: https://dwrcdc.nr.utah.gov/ucdc/default.asp.

Utah Division of Water Quality (Utah DWQ). 2016. Utah's Final 2016 Integrated Report. Salt Lake City, Utah. Utah Department of Environmental Quality. Available at: http://www.deq.utah.gov/ProgramsServices/programs/water/wqmanagement/assessment/currentIR2016.html.

Utah Division of Wildlife Resources (Utah DWR). 2015a. Utah Wildlife Action Plan Joint Team. Utah Wildlife Action Plan: A plan for managing native wildlife species and their habitats to help prevent listing under the Endangered Species Act. Publication number 15-14. Utah Division of Wildlife Resources. Salt Lake City, Utah.

Utah DWR. 2015b. *Utah State Sensitive Species List* – October 1, 2015. Utah Division of Wildlife Resources, Salt Lake City, Utah.

Utah Power and Light Company, and Ecosystems Research Institute. 1988. Weber River Instream Flow Evaluation, FERC No. 1744. August 1, 1988. 126 pp.

Utah Native Plant Society. 2015. Utah Rare Plant Guide. Available at: http://www.utahrareplants.org/rpg_species.html.

U.S. Fish and Wildlife Service (FWS). 2011. Utah Field Office Guidelines for Conducting and Reporting Botanical Inventories and Monitoring of Federally Listed, Proposed and Candidate Plants. August 31, 2011. West Valley City, Utah: USFWS Ecological Services Field Office. Available at: http://www.fws.gov/utahfieldoffice/SurveyorInfo.html.

FWS. 2019a. IPaC Resource List, Weber Hydroelectric Project, FERC No. 1744,

Weber, Davis, and Morgan Counties, Utah. https://ecos.fws.gov/ipac. Accessed on December 6, 2019.

FWS. 2019b. Guidelines for the identification of suitable habitat for the western distinct population segment of yellow-billed cuckoo in Utah. Available at: https://www.fws.gov/utahfieldoffice/surveyor.php. Accessed online on November 13, 2019.

Thompson, P. 2015. *Bonneville Cutthroat Trout and Bluehead Sucker in the Weber River: Endangered Species Act Implications?* Weber River Partnership Native Species Presentation. Available online: http://www.slideshare.net/PaulThompson47/weber-riverpartnership-native-species-presentation.

Webber, P.A., Thompson, P., and P. Budy. 2012. *Status and Structure of Two Populations of the Bluehead Sucker (Catostomus discobulus) in the Weber River, Utah.* The Southwestern Naturalist. 57(3):267-276.

Weber River Partnership. 2014. *The Weber River Watershed Plan.* Available at: https://extension.usu.edu/waterquality/files/uploads/Utah_Water_Week/Final_Weber_River_Restoration_Plan_2014.pdf
Accessed February 22, 2015.

8.0 LIST OF PREPARERS

Quinn Emmering – Terrestrial Resources and Threatened and Endangered Species (Wildlife Biologist; Ph.D., Zoology)

Jim Hastreiter – Water Resources, Aquatic Resources, and Threatened and Endangered Species (Fisheries Biologist; M.S., Natural Resources)

Khatoon Melick – Developmental Analysis (Environmental Engineer, Ph.D., Civil Engineering)

Evan Williams – Project Coordinator, Recreation, Aesthetics, and Land Use (Outdoor Recreation Planner; B.S., Recreation Management)

Frank Winchell – Cultural Resources (Archeologist; Ph.D., Anthropology)

APPENDIX A

PacifiCorp Memorandum of Agreement

PACIFICORP
MEMORANDUM OF AGREEMENT
Date filed: May 30, 2018

Weber Hydroelectric Project
FERC Project No. 1744

Regarding Protection, Mitigation and Enhancement Measures
at PacifiCorp's Weber Hydroelectric Project

This Memorandum of Agreement (MOA) is between PacifiCorp, Utah Division of Wildlife Resources (UDWR), U.S. Fish and Wildlife Service (FWS), U.S.D.A Forest Service (USFS), U.S. Bureau of Reclamation (BOR), American Whitewater (AW), Davis and Weber Counties Canal Company (DWCCC), Trout Unlimited (TU), Weber Basin Water Conservancy District (WBWCD) and Weber River Water Users Association (WRWUA), each of which may be individually referred to as a "Party" or collectively referred to as the "Parties."

RECITALS

A. PacifiCorp is Federal Energy Regulatory Commission (FERC) licensee of the Weber Hydroelectric Project, FERC Project No. 1744 (the Project), located on the Weber River in Weber, Morgan and Davis counties, Utah; and

B. PacifiCorp's current FERC license for the Project expires on May 31, 2020, and PacifiCorp has applied to FERC for a new license pursuant to the Federal Power Act (FPA), 16 U.S.C. § 791a et. seq.; and

C. The Parties to this MOA are all stakeholders with an interest in the relicensing of the Project; and

D. The Parties have agreed to a list of the protection, mitigation and enhancement measures (PM&E Measures) that the Parties believe best balance: the need to protect natural and cultural resources; the need for hydroelectric generation; the need to protect existing water rights; and the goal of enhancing recreational resources associated with the Project; and

E. The Parties wish to memorialize their agreement regarding the appropriate PM&E Measures for the relicensing of the Project and therefore enter into this MOA. This MOA will be submitted to FERC to demonstrate the Parties' support of and limitations to the PM&E Measures.

AGREEMENT

1. **Term.** This MOA will become effective when executed by all Parties. This MOA will remain in effect until the final 4(e) terms and license conditions have been submitted to and accepted by FERC, and the license is final.

2. **PM&E Measures.** The Parties agree that the PM&E Measures (as further defined by the Weber Final Technical Reports filed with FERC June 30, 2017), listed in Appendix A to this MOA are appropriate and represent a fair and acceptable balance of the interests involved, including without limitation: the need to protect natural and cultural resources; the need for hydroelectric generation; the need to protect existing water rights; and the goal of enhancing recreational resources associated with the Project. The Parties agree that during the FERC proceeding to relicense the Project, the Parties will advocate for the adoption of the PM&E measures listed in Appendix A. With the exceptions noted below, the Parties agree that they will not request, advocate for, or prescribe any measures beyond those listed in Appendix A or that are contrary to those listed in Appendix A *unless* all Parties to this MOA have first agreed in writing that such additional measures should be proposed to FERC. The PM&E Measures listed in Appendix A are incorporated into this MOA by this reference.

3. **Reservation of Authority under Section 4(e), Section 10(j), and Section 18 of the FPA.** Certain Parties to this MOA (the "Conditioning Parties", which include the USFWS, USFS, and UDWR) have statutory authority under one or more of the following sections of the FPA to recommend or prescribe certain license conditions: Section 4(e), 16 U.S.C. § 797(e); Section 10(j), 16 U.S.C. § 803(j)(1); and Section 18, 16 U.S.C. § 811. The Conditioning Parties reserve their statutory authority to prescribe or recommend license conditions and nothing in this MOA is intended to waive or alter existing federal law; ***however***, the Conditioning Parties each agree to use their best efforts to recommend license conditions consistent with the PM&E Measures contained in Appendix A.

4. **Support for the Conditions.** To the extent the 4(e) conditions are consistent with this MOA and the PM&E Measures, the Parties shall support the 4(e) conditions. Support for 4(e) conditions consistent with this MOA and PM&E Measures in Appendix A means: no Party will submit a request for a trial type hearing or submit alternative conditions regarding consistent 4(e) conditions; and no Party shall seek FERC rehearing or Appellate Court review of 4(e) conditions that are consistent with this MOA and the PM&E measures. To the extent allowed by applicable law, the Parties agree not to advocate to FERC for measures inconsistent with the PM&E Measures and consistent 4(e) conditions, or to any

other federal, state, or local agency, or court, whose approval may be necessary to put the PM&E measures into effect.

5. **Conditioning Authorities.** Nothing in this MOA is intended to amend, waive, forfeit or in any manner modify the authorities of the USFS, UDWR, and USFWS under sections 4(e), 10(j), and 18 of the Federal Power Act or any other federal law.

6. **Miscellaneous Provisions.** Except as referenced in Appendix A, this MOA, including Appendix A, constitutes the entire agreement between the Parties regarding PM&E Measures for the Project. No supplement, modification or amendment of this MOA will be effective unless it is in writing and signed by all Parties. No waiver of any term of this MOA is a waiver of any other term, and no waiver of any term constitutes a continuing waiver of that term. No waiver is effective unless signed in writing by the waiving Party. This MOA may be signed in any number of counterparts, each counterpart is an original, and together all counterparts form one single document. The provisions of the MOA will not be construed against the drafter.

7. **Rights under Agreement.** This MOA creates no right, benefit, remedy, or trust responsibility, substantive or procedural, enforceable by law or equity by any Party or by the Parties.

8. **No Third Party Rights.** Nothing in this MOA is intended to confer any rights or remedies on any person other than the Parties to this MOA.

9. **Assignment.** Neither this MOA, nor any right, interest or obligation hereunder, may be assigned, sold, transferred or conveyed without the prior written consent of the other Parties.

10. **Amendment.** This MOA may be altered, amended, or modified only by an instrument in writing, executed by the Parties to this MOA.

11. **Termination.** Any of the parties, in writing, may terminate their participation in this MOA at any time by providing written notice to the other Parties.

12. **Anti-Deficiency Act.** Nothing in this MOA shall be interpreted as or constitute a commitment or requirement that the federal agencies obligate funds in contravention of the Anti-Deficiency Act, 31 U.S.C. 1341, or any other applicable law or regulation.

13. **Coordinated Efforts.** The Parties shall manage their respective resources and activities in a separate, coordinated manner to meet the purpose(s) of this MOA.

Nothing in this MOA authorizes any of the Parties to obligate or transfer anything of value.

14. **Separate Agreements.** Specific, prospective projects or activities that involve the transfer of funds, services, property, and/or anything of value to a Party requires the execution of separate agreements and are contingent upon numerous factors, including, as applicable, but not limited to: agency availability of appropriated funds and other resources; cooperator availability of funds and other resources; agency and cooperator administrative and legal requirements (including agency authorization by statute); etc. This MOA neither provides, nor meets these criteria. If the Parties elect to enter into an obligation agreement that involves the transfer of funds, services, property, and/or anything of value to a Party, then the applicable criteria must be met. Additionally, under a prospective agreement, each Party operates under its own laws, regulations, and/or policies, and any Forest Service obligation is subject to the availability of appropriated funds and other resources. The negotiation, execution, and administration of these prospective agreements must comply with all applicable law.

15. **Reservation of Authority.** Nothing in this MOA is intended to alter, limit, or expand the agencies' statutory and regulatory authority.

16. **Notice.** Any notice required by this MOA shall be in writing. It shall be sent by first class mail, electronic mail, or comparable method of distribution to other Parties. For the purpose of notice, the authorized representatives of the Parties as of the Effective Date are:

17. **Authority.** Each signatory to this MOA certifies that he or she is authorized to execute this MOA.

PacifiCorp: Mark Sturtevant, Managing Director, Renewable Resources

Utah Division of Wildlife Resources: Michal D. Fowlks, Director

U.S. Fish and Wildlife Service: Larry Crist, Field Supervisor, Utah Ecological Services Field Office

U.S.D.A Forest Service: Nora B. Rasure, Regional Forester, Region 4

U.S. Bureau of Reclamation: Wayne Pullan, Area Manager

American Whitewater: Charles Vincent, Regional Representative

Davis and Weber Counties Canal Company: Richard D. Smith, P.E., General Manager

Trout Unlimited: Paul Burnett, Utah Water and Habitat Program Lead

Weber River Water Users Association: Richard D. Smith, P.E., General Manager

Weber Basin Water Conservancy District: Tage Flint, General Manager/CEO

RESOURCE	PROPOSED WEBER PM&E MEASURES
Geology and Soils	None
Water Resources - Hydrology	**HYD-1**: Continue existing seasonally-adjusted minimum stream flows (34-50 cfs). Implement annual change, if needed, in required minimum streamflow within 10 days of the final Weber River runoff forecast from Natural Resources Conservation Service (NRCS), using the current formula.
Water Resources – Water Rights	None No PM&E measure is proposed because existing 1938 and 1965 agreements and existing water rights [35-8061-365 cfs flow right, 35-8062-100 af storage, 35- 8741-storage in Echo] will remain unchanged.
Water Resources – Water Quality	None No PM&E measure is proposed because adherence to existing O&M practices is protective of the resource (state water quality standards are being met).
Fisheries and Aquatic Resources	**FISH-1**: Continue to provide minimum stream flow for the bypassed reach of the river affected by the Weber Project (identical to **HYD-1**, above). **FISH-2**: Construct, operate, and maintain a fish ladder suitable for upstream passage of both Bonneville Cutthroat Trout (BCT) and bluehead sucker, including a fish trap operated by Utah Division of Wildlife Resources (UDWR} and Trout Unlimited (TU} and maintained by PacifiCorp. PacifiCorp will consult annually with UDWR, TU, and U.S. Forest Service (USFS) related to fish ladder and trap operation and maintenance according to a Communication Plan developed between UDWR, TU, USFS, U.S. Fish and Wildlife Service (FWS) and PacifiCorp. The Communication Plan will also specify group contacts, alternates, and contact methods over the life of the license. **FISH-3**: Keep the low-level gate operational when forebay is

	dewatered subject to operational constraints and requirements such as extreme winter icing conditions (undertake periodic maintenance as required to ensure operation). If the forebay is dewatered and the low-level gate is inoperable for more than 10 days due to extreme temperature or flow conditions, PacifiCorp will consult with UDWR, TU, FWS}, Utah Division of Water Quality (UDWQ}, and USFS (per the Communication Plan methods) and open the low-level gate as soon as possible. **FISH-4**: In the event of a prolonged project outage keep forebay full if possible to ensure fish ladder operation; PacifiCorp will consult with UDWR, TU, FWS, UDWQ, and USFS (per the Communication Plan methods) to discuss fishway operation during any interim periods exceeding 10 days when neither the low-level gate nor the fishway are operable.
Botanical Resources	**BOT-1**: Continue existing annual USFS consultation. **BOT-2**: Conduct weed control per historic practice, adding the area abutting improved project river access point in riparian habitat (see REC-8, below), subject to landowner weed control requirements and constraints.
Terrestrial Wildlife Resources	**WL-1**: Continue existing annual USFS consultation.
Cultural and Tribal Resources	**CULT-1**: Finalize and implement the updated Historic Properties Management Plan (HPMP) (formerly approved as the Cultural Resources Management Plan [CRMP]).
Recreation Resources	**REC-1**: Continue to maintain the existing Weber Recreation Site, but with modifications outlined below. **REC-2**: Coordinate with USFS, UDWR, TU, UDWQ, FWS, and America Whitewater (AW) on improved interpretive signage; include potential for improved technology to include a code that is scan-able and that links to flow information (REC-3). Install signage instructing visitors on dog waste protocol and provide dog waste bags for disposal. **REC-3**: Create a webpage hosted and maintained by PacifiCorp (linked on both the Corporate website and the Project website) indicating approximate bypass reach flows (program subtracts generation flow from U.S. Geological Survey gage site flow and posts it to website)-when minimum streamflow only, the calculated number will be replaced by the phrase "minimum streamflow of approximately 50 cfs or inflow" to eliminate the risk of showing a calculated flow that could be less than the minimum for that period. **REC-4**: Install and maintain a year-round permanent vault Americans with Disabilities Act (ADA)/ Architectural Barriers Act

	(ABA)-compliant toilet facility (flush bathrooms are available at the Utah Department of Transportation (UDOT) rest stop upstream) **REC-5**: Consult with USFS to create a new ADA/ ABA compliant accessible picnic site on flat lawn area closest to parking lot (consisting of a concrete pad, a grill, and an accessible picnic table), or to modify the existing site per USFS standards. **REC-6**: Maintain/repave access road to Weber Recreation Site and existing asphalt path in picnic area. **REC-7**: Reconfigure former sandbox area fencing to remove south, east, and west portions (retain north portion to partition recreation site from 1-84) **REC-8**: Improve two existing user-created trails located in and outside the Weber FERC Project Boundary: a. In the Project Boundary, improve (construct steps) the existing dirt river access trail at the west end of the recreation site; b. Outside the Project Boundary, provide $30,000 through an off-license agreement with TU to fund cooperative effort to improve pedestrian river access (with concurrence from UDOT and the underlying land owner) at the under-freeway user-created trail extending west from the Weber recreation site-proposed improvements would involve breaking up the existing large-boulder surface or backfilling this surface to create a navigable path of smaller rock with minimal width (no paving). Funds provided through the off-license agreement may be used by TU to provide another habitat benefit in the watershed in the event that improving pedestrian river access in the indicated location is infeasible or requires less funding than provided through the agreement. **REC-9**: Support whitewater boating use of bypass reach: If AW can identify access which it believes to be safe and legal, the USFS and Davis and Weber Counties Canal Company (DWCCC) agree to review the proposed access and the items and improvements needed for safe use, such as but not limited to signage, steps for the portage area, and hazard mitigation. If the USFS agrees, in its sole discretion, that the proposed access is appropriate for public use, PacifiCorp will annually provide boater flows to the bypass reach by curtailing generation (up to 320 cfs or inflow) for 4-hour segments on four Saturdays prior to July 15. Flow schedule and notice to be determined in conjunction with AW, and in coordination with DWCCC and USFS, with the provision that boater flows in the

	future may be subject to minimum boater use (fewer than a minimum threshold of boaters may result in suspension of boater flows). Specific use triggers and related release changes to be determined.
Land Use	None
Aesthetic Resources	None
Socioeconomic Resources	None

APPENDIX B

U.S. Department of Agriculture, Forest Service Final Conditions

USDA FOREST SERVICE
FINAL SECTION 4(e) TERMS AND CONDITIONS
Date filed: December 17, 2018

Weber Hydroelectric Project
FERC Project No. 1744

LICENSE CONDITIONS NECESSARY FOR PROTECTION AND UTILIZATION OF THE UINTA-WASATCH-CACHE NATIONAL FOREST IN CONNECTION WITH THE APPLICATION FOR MAJOR CONSTRUCTED PROJECT, WEBER HYDROELECTRIC PROJECT NO. 1744-039

INTRODUCTION

The United States Department of Agriculture Forest Service submits the following Final Section 4(e) Conditions for the Weber Hydroelectric Project, FERC No. 1744-039, in accordance with 18 CFR 4.34(b)(1)(i). Section 4(e) of the Federal Power Act (FPA), which states the Commission may issue a license for a project within a reservation only if it finds that the License will not interfere or be inconsistent with the purpose for which such reservation was created or acquired. This is an independent threshold determination made by the Commission, with the purpose of the reservation defined by the authorizing legislation or proclamation (see *Rainsong* v. FERC, 106 F.3d 269 (9th Cir. 1977). The Forest Service, for its protection and utilization determination under Section 4(e) of the FPA, may rely on broader purposes than those contained in the original authorizing statutes and proclamations in prescribing conditions (see *Southern California Edison v. FERC*, 116F.3d 507 (D.C. Cir. 1997)).

The following terms and conditions are based on those resource and management requirements enumerated in the Organic Administration Act of 1897 (30 Stat. 11), the Multiple-Use Sustained Yield Act of 1960 (74 Stat. 215), the National Forest Management Act of 1976 (90 Stat. 2949), and any other law specifically establishing a unit of the National Forest System (NFS) or prescribing the management thereof (such as the Wild and Scenic Rivers Act), as such laws may be amended from time to time, and as implemented by regulations and approved by Land and Resource Management Plans prepared in accordance with the National Forest Management Act. Specifically, the 4(e) conditions in this document are based on the Land and Resource Management Plan (as amended) for the Uinta-Wasatch-Cache National Forest, as approved by the Regional Forester of the Intermountain Region, Region 4.

Pursuant to Section 4(e) of the Federal Power Act, the Secretary of Agriculture, acting by and through Forest Service, considers the following conditions necessary for the adequate protection and utilization of the land and resources of the Uinta-Wasatch-Cache National Forest. License articles contained in the Federal Energy Regulatory Commission's (Commission's) Standard Form L-1 (revised October 1975) issued by Order No. 540, dated October 31, 1975, cover general requirements. Part I of this document includes standard administrative conditions deemed necessary for the administration of NFS lands. Part II of this document includes standard resource conditions deemed necessary for protection and utilization of NFS lands. Part III of this document includes project specific resource requirements related to the Weber Hydroelectric Project, including all of the protection, mitigation, and enhancement (PM&E) measures from the Project memorandum of agreement, as conditions deemed necessary for protection and utilization of NFS lands.

PART I. STANDARD ADMINISTRATIVE CONDITIONS

Condition No. 1 - Revision of Forest Service Conditions

Forest Service reserves the right, after notice and opportunity for comment, to require changes in the Project and its operation through revision of the Section 4(e) conditions to accomplish protection and utilization of National Forest System (NFS) lands and resources. Forest Service also reserves the right to modify these conditions, if necessary, to respond to any significant changes that warrant a revision of these conditions, for example, a Final Biological Opinion issued for this Project by the National Marine Fisheries Service or United States Fish and Wildlife Service; or any Certification issued for this Project by Utah Department of Natural Resources, Division of Water Resources.

Condition No. 2 - Surrender of License or Transfer of Ownership

Prior to any surrender of this license, Licensee shall provide assurance acceptable to the Forest Service that Licensee shall restore any project area directly affecting NFS lands to a condition satisfactory to the Forest Service upon or after surrender of the license, as appropriate. To the extent restoration is required, Licensee shall prepare a restoration plan for Forest Service review and approval, which shall identify the measures to be taken to restore such NFS lands and shall include adequate financial mechanisms to ensure performance of the restoration measures.

In the event of any transfer of the license or sale of the project, Licensee shall assure that, in a manner satisfactory to Forest Service, Licensee or transferee will provide for the costs of surrender and restoration. If deemed necessary by the Forest Service to assist it in evaluating Licensee's proposal, Licensee shall conduct an analysis, using experts approved by the Forest Service, to estimate the potential costs associated with surrender and restoration of any project area directly affecting NFS lands to Forest Service

specifications. In addition, the Forest Service may require Licensee to pay for an independent audit of the transferee to assist the Forest Service in determining whether the transferee has the financial ability to fund the surrender and restoration work specified in the analysis.

Condition No. 3 - Requirement to Obtain a Forest Service Special Use Authorization for Use of National Forest System Lands

Licensee shall apply for and obtain a new or amended special use authorization from Forest Service for the occupancy and use of lands previously covered by a special use authorization in any previous license. Licensee shall obtain the executed authorization within 6 months of license issuance and prior to beginning any ground disturbing activities on NFS lands to be covered by the special use authorization, and shall file that special use authorization with the Commission. Licensee shall be responsible for the costs of collecting any information Forest Service needs in order to make a decision concerning issuance of special use authorization.

During the term of the License, if the Commission determines that the project involves the use of any additional NFS lands, outside the current project boundary, Licensee shall obtain a special use authorization from Forest Service for the occupancy and use of such additional NFS lands. Licensee shall obtain the executed authorization before beginning any ground-disturbing activities on NFS lands outside the FERC boundary covered by the special use authorization, and shall file that authorization with the Commission if the activity is related to the Project. Licensee shall be responsible for the costs of collecting all information directly related to the evaluation of the effects of the proposed occupancy and use that Forest Service needs in order to make a decision concerning issuance of a special use authorization.

Condition No. 4 - Requirement to Obtain Temporary Forest Service Special Use Authorization

During the term of the License, if Licensee proposes to perform any project construction work, Licensee shall obtain a temporary special use authorization from Forest Service before beginning any ground disturbing activities on NFS lands outside the FERC Project boundary. The special use authorization will include appropriate vegetation management and erosion control measures as needed to protect NFS lands and resources. Licensee shall be responsible for the costs of collecting and analyzing all info1mation directly related to the evaluation of the effects of the proposed construction that Forest Service needs in order to make a decision concerning issuance of a temporary special use authorization.

Licensee may commence ground disturbing activities authorized by the License and temporary special use authorization no sooner than 60 days following the date Licensee

files the special use authorization with the Commission, if the special use authorization is related to Project activity, unless the Commission prescribes a different commencement schedule. In the event there is a conflict between any provisions of the License and Forest Service special use authorization, the special use authorization shall prevail to the extent that Forest Service, in consultation with the Commission, deems necessary to protect and utilize NFS resources.

Condition No. 5 - Compliance with Regulations

Licensee shall comply with the regulations of the United States Department of Agriculture for activities on NFS lands, and all applicable Federal, State, county, and municipal laws, ordinances, or regulations in regards to the area or operations on or directly affecting NFS lands, to the extent those laws, ordinances or regulations are not preempted by federal law.

Condition No. 6 - Protection of United States Property

Licensee, including any agents or employees of Licensee acting with the scope of their employment, shall exercise diligence in protecting from damage the land, prope1iy, and interests of the United States from damage arising from Licensee's construction, maintenance, or operation of the project works or the works appurtenant or accessory thereto under the license. Licensee's liability for fire and other damages to NFS lands shall be determined in accordance with the Federal Power Act and standard Form L-1 Articles 22 and 24.

As part of the occupancy and use of the project area, Licensee has a continuing responsibility to reasonably identify and report all known or observed hazardous conditions on or directly affecting NFS lands that would affect the improvements, resources, or pose a risk of injury to individuals. Licensee will abate those conditions, except those caused by third parties or not related to the occupancy and use authorized by the License. Any non-emergency actions to abate such hazards on NFS lands shall be performed after consultation with Forest Service. In emergency situations, Licensee shall notify Forest Service of its actions as soon as possible, but not more than 48 hours, after such actions have been taken. Whether or not Forest Service is notified or provides consultation, Licensee shall remain solely responsible for all abatement measures performed. Other hazards should be reported to the appropriate agency as soon as possible.

Licensee shall maintain all its improvements and premises on NFS lands to standards of repair, orderliness, neatness, sanitation, and safety acceptable to Forest Service. Licensee shall comply with all applicable Federal, State, and local laws and regulations, including but not limited to, the Federal Water Pollution Control Act, 33 U.S.C. 1251 et seq., the Resources Conservation and Recovery Act, 42 U.S.C. 6901 et seq., the Comprehensive

Environmental Response, Control, and Liability Act, 42 U.S.C. 9601 et seq., and other relevant environmental laws, as well as public health and safety laws and other laws relating to the siting, construction, operation, and maintenance of any facility, improvement, or equipment. Disposal of all materials will be at an approved existing location, except as otherwise agreed by Forest Service.

Condition No. 7- Existing Claims

License shall be subject to all valid claims and existing rights of third parties. The United States is not liable to Licensee for the exercise of any such tight or claim.

Condition No. 8 - Indemnification

Licensee shall indemnify, defend, and hold the United States harmless for:

- any violations incurred under any laws and regulations applicable to, or
- judgments, claims, penalties, fees, or demands assessed against the United States caused by, or
- costs, damages, and expenses incurred by the United States caused by, or
- the releases or threatened release of any solid waste, hazardous substances, pollutant, contaminant, or oil in any form in the environment related to the construction, maintenance, or operation of the project works or of the works appurtenant or accessory thereto under the license.

Licensee's indemnification of the United States shall include any loss by personal injury, loss of life or damage to property caused by the construction, maintenance, or operation of the project works or of the works appurtenant or accessory thereto under the license. Indemnification shall include, but is not limited to, the value of resources damaged or destroyed; the costs of restoration, cleanup, or other mitigation; fire suppression or other types of abatement costs; third party claims and judgments; and all administrative, interest, and other legal costs. Upon surrender, transfer, or termination of the license, Licensee's obligation to indemnify and hold harmless the United States shall survive for all valid claims for actions that occurred prior to such surrender, transfer or termination.

Condition No. 9 - Access within the License Area

The United States shall have unrestricted use of any part of the licensed area on NFS lands for any purpose, including permitting uses by third parties or members of the public, provided such use does not interfere with the rights and privileges autho1ized for the license. operation of the Project works or the works appurtenant or accessory thereto under the license.

Condition No. 10 - Use of National Forest System Roads

Licensee shall obtain suitable authorization for any NFS roads needed for Project access, if applicable. If needed, authorization shall specify road maintenance and management standards that provide for traffic safety, minimize erosion, and minimize damage to natural resources and that are acceptable to Forest Service, as appropriate.

The project specific conditions in Part III hereof include the PM&E Measure requiring Licensee to "Maintain/repave access road to Weber Recreation Site and existing asphalt path in picnic area" (REC-6). Any maintenance to be performed by Licensee shall be authorized by and shall be performed in accordance with applicable Best Management Practices (BMPs). In the event a road requires maintenance, restoration, or reconstruction work to accommodate Licensee's needs, Licensee shall perform such work at its own expense after securing Forest Service authorization.

Forest Service reserves the right to close any and all NFS routes where damage is occurring to the soil or vegetation or to require reconstruction/construction by Licensee to the extent needed to accommodate Licensee's use. Forest Service agrees to provide notice to Licensee prior to road closures, except in an emergency, in which case notice will be provided as soon as practicable. Licensee shall maintain suitable crossings as required by Forest Service for all roads and trails that intersect the right-of-way occupied by linear Project facilities (powerline, penstock, ditch, and pipeline).

Condition No. 11 – Hazardous Substances Plan

Licensee shall continue to maintain, update and implement the site-specific Oil Spill Prevention, Control and Countermeasure Plan (SPCC Plan). Licensee shall ensure the SPCC Plan conforms to all state, local and federal regulatory requirements, including but not limited to:

- Management of waste oil debris resulting from an oil spill cleanup;
- Above ground bulk storage;
- Hazardous materials reporting;
- Hazardous waste management; and
- Storm water management and discharge.

Condition No. 12 - Pesticide-Use Restrictions on National Forest System Lands

Licensee shall implement all site specific conditions included in Part III hereof, including but not limited to MOA PM&E Measures for Botanical Resources. Pesticides may not be used on NFS lands or in areas affecting NFS lands to control undesirable woody and herbaceous vegetation, aquatic plants, insects, rodents, non-native fish, etc., without the prior written approval of Forest Service.

Any request by Licensee to use pesticides shall be accompanied by the following:

- A determination as to whether pesticide applications are essential for use on NFS lands;
- Specific locations of use;
- Specific pesticides proposed for use;
- Application rates;
- Dose and exposure rates; and
- Safety risk and timeframes for application.

Exceptions to this schedule may be allowed only when unexpected outbreaks of pests require control measures that were not anticipated at the time the report was submitted. In such an instance, an emergency request and approval may be made.

On NFS lands, Licensee shall only use those materials registered by the U.S. Environmental Protection Agency and consistent with those applied by Forest Service and approved through Forest Service review for the specific purpose planned. Licensee must strictly follow label instructions in the preparation and application of pesticides and disposal of excess materials and containers. Licensee may also submit Pesticide Use Proposal(s) with accompanying risk assessment and other Forest Service required documents to use pesticides on a regular basis. Submission of this plan will not relieve Licensee of the responsibility of annual notification and review, if applicable.

Condition No. 13 - Consultation

Licensee shall annually consult with the Forest Service. The date of the consultation meeting will be mutually agreed to by the Licensee and Forest Service but in general should be held by April 15. At least 30 days in advance of the meeting, Licensee shall also notify interested stakeholders, confirming the meeting location, time and agenda, which shall include all MOA signatories and other parties listed below, including:

- Utah Department of Environmental Quality (DEQ)
- Utah Division of Wildlife Resources
- U.S. Fish and Wildlife Service
- U.S. Bureau of Reclamation
- American Whitewater
- Davis and Weber Counties Canal Company
- Trout Unlimited (Utah)
- Weber River Water Users Association
- Weber Basin Water Conservancy District

Licensee shall attempt to coordinate the meeting so interested agencies and other stakeholders may attend, as appropriate. Licensee shall provide any information pertinent to the meeting requested by Forest Service or other meeting participants at least 30 days prior to the meeting, if possible.

Consultation shall include, but not be limited to, the following:

a. Status of implementation of license conditions, including the status of any ongoing Project MOA PM&E Measures in Part III hereof;
b. Results of any monitoring or results over the previous year, including any results relating to Project MOA PM&E Measures, such as HYD-1, FISH- 2, and REC-9;
c. Discussion and review of completed or planned maintenance at the site;
d. Discussion of any foreseeable changes to Project facilities or feature;
e. Discussion of any necessary revisions or modifications to implementation plans approved as part of this license;
f. Discussion of any potential protection measures for species newly listed as threatened, endangered, or sensitive, or changes to existing management plans that may no longer be warranted due to delisting of species or, to incorporate new knowledge about a species requiring protection. Discussion of needed protection measures for newly discovered cultural resource sites; and
g. Discussion of any planned weed control or pesticide use.

In addition to the topics listed above, the Licensee shall consult with Forest Service annually to determine whether employee site-awareness training is needed to address site-specific resource issues such as sensitive areas, safety, erosion, BMPs, vegetation management or other site issues. Licensee shall incorporate Forest Service consultation information and recommendations into employee training or notifications, as needed.

A record of the meeting shall be kept by Licensee and shall include any recommendations made by Forest Service for the protection of NFS lands and resources, including any specific training needs. Licensee shall file the meeting record with the Commission no later than 60 days following the meeting.

Additional Consultation Groups

The Licensee shall coordinate, consult, and communicate with other resource groups as required in the PM&E Measures in the Project MOA; attached in Part III, Project Specific Conditions. Licensee shall provide notification of license compliance deviations to all interested stakeholders and consulting parties, as needed.

Fish Passage Consultation and Communication Plan

As agreed to in the Project MOA PM&E Measures for Fisheries and Aquatic Resources, Licensee shall develop and implement a Communication Plan including the Forest Service, Utah Division of Wildlife Resources (UDWR), Trout Unlimited (TU), U.S. Fish and Wildlife Service (FWS), Utah Division of Water Quality (UDWQ), and PacifiCorp. The general purpose and need of the consultation plans described in the Project MOA, PM&E Measures include, but are not limited to; providing a forum for the Licensee to consult with resource agencies and other interested parties on fish ladder and passage, operations for passage, and fishway issues and outages.

Recreation Resources Coordination

Licensee shall coordinate with the Forest Service, UDWR, TU, UDWQ, FWS, America Whitewater, and Utah Department of Transportation (UDOT), as agreed in the Project MOA for Recreation Resources including conditions in PM&E Measures REC-2, REC-5, REC-8 and REC-9.

Condition No. 14 – Approval of Changes

Notwithstanding any license authorization to make changes to the Project, when such changes directly affect NFS lands, Licensee shall obtain written approval from Forest Service prior to making any changes in any constructed Project features or facilities, or in the uses of Project lands and waters or any departure from the requirements of any approved exhibits filed with the Commission. Following receipt of such approval from Forest Service, and a minimum of 60 days prior to initiating any such changes, Licensee shall file a report with the Commission describing the changes, the reasons for the changes, and showing the approval of Forest Service for such changes. Licensee shall file an exact copy of this report with Forest Service at the same time it is filed with the Commission. This condition does not relieve Licensee from the amendment or requirements of this License.

Condition No. 15 - Surveys, Land Corners

Licensee shall avoid disturbance to all public land survey monuments, private property corners, and forest boundary markers. In the event that any such land markers or monuments on NFS lands are destroyed by an act or omission of Licensee, in connection with the use and/or occupancy authorized by this license, depending on the type of monument destroyed, the Licensee shall reestablish or reference same in accordance with (1) the procedures outlined in the "Manual of Instructions for the Survey of the Public Land of the United States," (2) the specifications of the County Surveyor, or (3) the specifications of Forest Service. Further, Licensee shall ensure that any such official survey records affected are amended as provided by law.

Condition No. 16 - Signs

Licensee shall consult with Forest Service prior to erecting signs related to safety issues on NFS lands covered by the license. Prior to Licensee erecting any other signs or advertising devices on NFS lands covered by the license, Licensee must obtain the approval of Forest Service as to location, design, size, color, and message. Licensee shall be responsible for maintaining all Licensee-erected signs to neat and presentable standards.

PART II. STANDARD RESOURCE CONDITIONS

Condition No. 17 – Invasive Species Management

Licensee is responsible for developing Best Management Practices (BMPs) for individual Project O&M activities, performed by Licensee and/or its contractors, when activities have the potential to introduce or proliferate aquatic or terrestrial invasive species into the Project reservoir or downstream. BMPs relating to pesticide use, vegetation management and weed control measures shall be consistent with Condition No. 12 hereof, and all Project MOA conditions included in Part III, PM&E Measures.

If invasive aquatic species are determined by a management agency to be an issue within the reservoir, Licensee shall consult with pertinent agencies and institute an appropriate plan of action. Similarly, the Licensee shall consult with the Forest Service and appropriate state agencies on any invasive or noxious weed concerns.

Condition No. 18 – Special Status Species and Sensitive Areas

Licensee shall consult on any issues relating to special status species and sensitive areas, consistent with the consultation groups described in Condition No. 13 hereof, pursuant to the Conditions agreed upon by all parties of the MOA attached in Part III, Project Specific Conditions in PM&E Measures.

Condition No. 19 – Erosion and Sediment Control and Management

Licensee is responsible for implementing erosion and sediment control BMPs for any Project O&M activities performed by Licensee and/or its contractors, as applicable, and consistent with the Project MOA conditions attached in Part III, PM&E Measures. If requested by Forest Service, Licensee shall develop and submit site-specific temporary erosion control measures and BMPs for activities with potential to impact NFS land. These measures will prevent erosion, stream sedimentation, dust, and soil mass movement during the Project activities and until replaced by permanent measures or adequate vegetation re-growth.

Condition No. 20 – Fire Prevention and Response Plan

Within 1 year of license issuance, Licensee shall complete, in consultation with Forest Service and subject to the final approval by Forest Service, a Fire Prevention and Response Plan. The Plan shall set forth in detail Licensee's responsibility for the prevention (including fuels treatment, as needed), reporting, emergency response, and investigation of fires related to Project operations. Upon Commission approval, Licensee shall file the Fire Prevention and Response Plan with the Commission, and implement the Plan.

Minimum plan components include, but may not be limited to:

- Fuels Treatment/Vegetation Management: Identification of fire hazard reduction measures and reoccurring maintenance measures to prevent the escape of project-induced fires.
- Fire Prevention and Patrol: Address fire danger and public safety associated with project induced recreation, including fire danger associated with dispersed camping, existing and proposed developed recreation sites, trails, and vehicle access. Identify water drafting sites and other fire suppression resources.
- Emergency Response Preparedness: Analyze fire prevention needs including equipment and personnel availability.
- Reporting: Licensee shall report any project related fires immediately to Forest Service.
- Fire Control/Extinguishing: Provide Forest Service a list of the locations of available fire suppression equipment and the location and availability of fire suppression personnel.

PART III. PROJECT SPECIFIC CONDITIONS

Project specific conditions for the Weber Hydroelectric Project (Project) include the conditions identified in the signed Memorandum of Agreement (MOA), Regarding Protection, Mitigation and Enhancement (PM&E) Measures at PacifiCorp's Weber Hydroelectric Project. The Project PM&E Measures listed in Appendix A of the MOA were filed separately with the Commission by PacifiCorp in the Final License Application, Exhibit E, Appendix A on May 30, 2018 (FERC eLibrary Accession No. 20180530-5085). The Forest Service is a signatory to the Project MOA, and all of the PM&E Measures listed in Exhibit E, Appendix A of the Final License Application are included as final 4(e) License Conditions, as listed in the following table.

RESOURCE	WEBER PM&E MEASURES
Geology and Soils	None
Water Resources - Hydrology	**HYD-1**: Continue existing seasonally-adjusted minimum stream flows (34-50 cfs). Implement annual change, if needed, in required minimum streamflow within 10 days of the final Weber River runoff forecast from Natural Resources Conservation Service (NRCS), using the current formula.
Water Resources – Water Rights	None No PM&E measure is proposed because existing 1938 and 1965 agreements and existing water rights [35-8061-365 cfs flow right, 35-8062-100 af storage, 35- 8741-storage in Echo] will remain unchanged.
Water Resources – Water Quality	None No PM&E measure is proposed because adherence to existing O&M practices is protective of the resource (state water quality standards are being met).
Fisheries and Aquatic Resources	**FISH-1**: Continue to provide minimum stream flow for the bypassed reach of the river affected by the Weber Project (identical to **HYD-1**, above). **FISH-2**: Construct, operate, and maintain a fish ladder suitable for upstream passage of both Bonneville Cutthroat Trout (BCT) and bluehead sucker, including a fish trap operated by Utah Division of Wildlife Resources (UDWR} and Trout Unlimited (TU} and maintained by PacifiCorp. PacifiCorp will consult annually with UDWR, TU, and U.S. Forest Service (USFS) related to fish ladder and trap operation and maintenance according to a Communication Plan developed between UDWR, TU, USFS, U.S. Fish and Wildlife Service (FWS) and PacifiCorp. The Communication Plan will also specify group contacts, alternates, and contact methods over the life of the license. **FISH-3**: Keep the low-level gate operational when forebay is dewatered subject to operational constraints and requirements such as extreme winter icing conditions (undertake periodic maintenance as required to ensure operation). If the forebay is dewatered and the low-level gate is inoperable for more than 10 days due to extreme temperature or flow conditions, PacifiCorp will consult with UDWR, TU, FWS}, Utah Division of Water Quality (UDWQ}, and USFS (per the Communication Plan methods) and open the low-level gate as soon as possible. **FISH-4**: In the event of a prolonged project outage keep forebay full if possible to ensure fish ladder operation; PacifiCorp will consult with UDWR, TU, FWS, UDWQ, and USFS (per the

	Communication Plan methods) to discuss fishway operation during any interim periods exceeding 10 days when neither the low-level gate nor the fishway are operable.
Botanical Resources	**BOT-1**: Continue existing annual USFS consultation. **BOT-2**: Conduct weed control per historic practice, adding the area abutting improved project river access point in riparian habitat (see REC-8, below), subject to landowner weed control requirements and constraints.
Terrestrial Wildlife Resources	**WL-1**: Continue existing annual USFS consultation.
Cultural and Tribal Resources	**CULT-1**: Finalize and implement the updated Historic Properties Management Plan (HPMP) (formerly approved as the Cultural Resources Management Plan [CRMP]).
Recreation Resources	**REC-1**: Continue to maintain the existing Weber Recreation Site, but with modifications outlined below. **REC-2**: Coordinate with USFS, UDWR, TU, UDWQ, FWS, and America Whitewater (AW) on improved interpretive signage; include potential for improved technology to include a code that is scan-able and that links to flow information (REC-3). Install signage instructing visitors on dog waste protocol and provide dog waste bags for disposal. **REC-3**: Create a webpage hosted and maintained by PacifiCorp (linked on both the Corporate website and the Project website) indicating approximate bypass reach flows (program subtracts generation flow from U.S. Geological Survey gage site flow and posts it to website)-when minimum streamflow only, the calculated number will be replaced by the phrase "minimum streamflow of approximately 50 cfs or inflow" to eliminate the risk of showing a calculated flow that could be less than the minimum for that period. **REC-4**: Install and maintain a year-round permanent vault Americans with Disabilities Act (ADA)/ Architectural Barriers Act (ABA)-compliant toilet facility (flush bathrooms are available at the Utah Department of Transportation (UDOT) rest stop upstream) **REC-5**: Consult with USFS to create a new ADA/ ABA compliant accessible picnic site on flat lawn area closest to parking lot (consisting of a concrete pad, a grill, and an accessible picnic table), or to modify the existing site per USFS standards. **REC-6**: Maintain/repave access road to Weber Recreation Site and existing asphalt path in picnic area. **REC-7**: Reconfigure former sandbox area fencing to remove south, east, and west portions (retain north portion to partition recreation site from 1-84)

	REC-8: Improve two existing user-created trails located in and outside the Weber FERC Project Boundary: c. In the Project Boundary, improve (construct steps) the existing dirt river access trail at the west end of the recreation site; d. Outside the Project Boundary, provide $30,000 through an off-license agreement with TU to fund cooperative effort to improve pedestrian river access (with concurrence from UDOT and the underlying land owner) at the under-freeway user-created trail extending west from the Weber recreation site-proposed improvements would involve breaking up the existing large-boulder surface or backfilling this surface to create a navigable path of smaller rock with minimal width (no paving). Funds provided through the off-license agreement may be used by TU to provide another habitat benefit in the watershed in the event that improving pedestrian river access in the indicated location is infeasible or requires less funding than provided through the agreement. **REC-9**: Support whitewater boating use of bypass reach: If AW can identify access which it believes to be safe and legal, the USFS and Davis and Weber Counties Canal Company (DWCCC) agree to review the proposed access and the items and improvements needed for safe use, such as but not limited to signage, steps for the portage area, and hazard mitigation. If the USFS agrees, in its sole discretion, that the proposed access is appropriate for public use, PacifiCorp will annually provide boater flows to the bypass reach by curtailing generation (up to 320 cfs or inflow) for 4-hour segments on four Saturdays prior to July 15. Flow schedule and notice to be determined in conjunction with AW, and in coordination with DWCCC and USFS, with the provision that boater flows in the future may be subject to minimum boater use (fewer than a minimum threshold of boaters may result in suspension of boater flows). Specific use triggers and related release changes to be determined.
Land Use	None
Aesthetic Resources	None
Socioeconomic Resources	None

APPENDIX C

State of Utah Division of Water Quality

Department of Environmental Quality Conditions

STATE OF UTAH DIVISION OF WATER QUALITY
DEPARTMENT OF ENVIRONMENTAL QUALITY
§401 WATER QUALITY CERTIFICATION NO. DWQ-2018-12001
Date filed: May 1, 2019

Weber Hydroelectric Project
FERC Project No. 1744

INTRODUCTION

Pursuant to §401 of the Federal Clean Water Act (CWA), the Utah Department of Environmental Quality (DEQ), Division of Water Quality (DWQ) certifies that the applicant has provided reasonable assurance that any discharges associated with the proposed project will not violate surface water quality standards, or cause additional degradation in surface water not presently meeting water quality standards. In accordance with Section 401(a)(1) of the CWA [33 U.S.C. Sec. l34l(a)(l)], DWQ herby issues this §401 Water Quality Certification provided any listed conditions are met and included in the corresponding Federal Energy Regulatory Commission (FERC) license.

CERTIFICATION CONDITIONS

The Federal Energy Regulatory Commission (FERC) is requested to include all of the conditions of this §401 Water Quality Certification with Conditions in the FERC license renewal. Approval is hereby given to conduct the outlined project requests as described in the Certification Application, under the following conditions:

I. Project Specific Conditions:

1. Fish Ladder

   a. PacifiCorp will construct and operate a fish ladder suitable for upstream passage of both Bonneville Cutthroat Trout (*Oncorhynchus clarkii*) and the Bluehead Sucker (*Catostomus discobolus*). The design should include a fish trap.
   b. Work on the Fish Ladder should not be conducted from February to June to allow for the movement and spawning of the Bonneville Cutthroat Trout and the Bluehead Sucker, which are both special status aquatic species.
   c. During/after construction of the fish ladder PacifiCorp should continue to coordinate with project stakeholders, for work related to, but not limited to, channel dewatering, fish salvage, and fish trap operation and maintenance.

2. Flow Requirements

a. Previous Stream flow requirements should remain. A minimum stream flow of 34 cfs or inflow, whichever is less from October 1 to March 31 annually, and a continuous minimum flow of 34-50 cubic feet per second (cfs) (dependent on annual runoff forecast), or inflow, whichever is less from April- September 30.
b. Once the fish ladder is installed a portion of the required minimum flow (approx. 20 cfs) should be passed through the fish ladder and he rest (approx. 14-30 cfs) should be used as attraction flow.

3. Best Management Practices (BMPs)

a. Construction of the fish ladder should be accomplished during a period of low flow. Sediment discharges into stream flows during construction must be limited through the use of BMPs to minimize increases in turbidity downstream. Flows must be diverted away from the construction area using a non-erodible cofferdam or other means of bypass.
b. Prior to the start of the project either (1) an area within the project boundary will be identified to store the excavated material from the constructed fish ladder, a minimum 50 feet from the Weber River and protected using proper BMPs to prevent discharges into Waters of the State or (2) a plan will be made to transport the excavated material offsite for storage in an upland location or disposal.
c. Prior to refueling of equipment over porous ground within 500 feet from the edge of the nearest waterbody (including wetlands), 200 feet from the nearest private water supply well, or 100 feet from the nearest municipal water supply well, a refueling plan must be developed and approved by DEQ. The refueling plan shall consider and address fueling actions and responsive spill prevention/containment measures for a variety of equipment and locations. Storage of lubricants and fuels within these same conditions is only allowed in proper storage facilities with secondary containment unless storage of lubricants and fuels plan has been developed and approved by DEQ.

II. General Conditions

1. Good Housekeeping

a. Applicant and their subcontractors shall ensure that all workers involved are continuously aware of the water quality protection measures before the start and during the construction period.
b. Retain a copy of this §40 1 Certification onsite, during fish ladder construction.

2. Stormwater and BMPs

   a. Water quality standards in associated water resources could be violated unless appropriate Best Management Practices (BMPs) are incorporated to minimize the erosion-sediment and nutrient load to any adjacent waters during project construction. The applicant shall not use any fill material which may leach organic chemicals (e.g. discarded asphalt), noxious weeds/seeds or nutrients (e.g., phosphate rock) into waters of the State.
   b. Construction activities that disturb one acre or more, or are part of a common plan of development, are required to obtain coverage under the Utah Pollutant Discharge Elimination System (UPDES) Stormwater General Permit for Construction Activities, Permit No. UTR300000.[20] The permit requires the development of a Storm Water Pollution Prevention Plan (SWPPP) to be implemented and updated from the commencement of any soil disturbing activities at the site, until final stabilization of the project. The SWPPP should include, but not limited to, final site maps and legible plans, location of stormwater outfalls/discharges, as well as information pertaining to any stormwater retention requirements.
   c. Dewatering activities, if necessary during construction, may require coverage under the UPDES General Permit for Construction Dewatering, Permit No. UTG070000.[21] The permit requires water quality monitoring every two weeks to ensure that the pumped water is meeting permit effluent limitations, unless water is contained onsite.
   d. A project within a Municipal Separate Storm Sewer System (MS4) jurisdiction, must comply with all the conditions required in that UPDES MS4 Permit and associated ordinances. No condition of this 401 Certification shall reduce or minimize any requirements provided in the MS4 Permit. In the case of conflicting requirements, the most stringent criteria shall apply.

3. Spills

   a. Utah Annotated Code 19-5-114 requires that any spill or discharge of oil or other substances which may cause pollution to waters of the State, including wetlands, must be immediately reported to the Utah DEQ Spill Hotline at (801) 536-4123, a 24-hour phone number.

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[20] Link: https://documents.deq.utah.gov/water-quality/permits/updes/DWQ-20I7-003485.pdf

[21] Link: https://deq.utah.gov/legacy/permits/water-quality/utah-pollutant-discharge-elimination-systerm/docs/utg070000.pdf