

VOLUME II

EXHIBIT E – ENVIRONMENTAL REPORT

**Yale Hydroelectric Project
(FERC No. P-2071)**

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List of Acronyms and Abbreviations

ACHP	Advisory Council on Historic Preservation
ADA	Americans with Disabilities Act
amsl	Above Mean Sea Level
BMP	Best Management Practice
CEQ	Council on Environmental Quality
cfs	Cubic Feet Per Second
CFR	Code of Federal Regulations
CCC	Cowlitz County Code
CWA	Clean Water Act
DAHP	Washington Department of Archaeology and Historic Preservation
Ecology	Washington State Department of Ecology
EFH	Essential Fish Habitat
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
H	Horizontal
HPMP	Historic Properties Management Plan
IWWPP	In-water Work Protection Plan
JARPA	Joint Aquatic Resources Permit Application
MSA	Magnuson-Stevens Fishery Conservation Management Act
National Register	National Register of Historic Places
NMFS	National Marine Fisheries Service
NHPA	National Historic Preservation Act
NTU	Nephelometric Turbidity Unit
OHWL	Ordinary High-Water Line
PA	Programmatic Agreement
Program	Columbia River Basin Fish and Wildlife Program
RCW	Revised Code of Washington
RRMP	Recreation Resource Management Plan
SEPA	State Environmental Policy Act
SMP	Shoreline Management Program
SPCCP	Spill Prevention, Control, and Countermeasure Plan
SSDP	Shoreline Substantial Development Permit

TCC	Terrestrial Coordination Committee
TESC	Temporary Erosion and Sediment Control
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
V	Vertical
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WHMP	Wildlife Habitat Management Plan
WRIA	Water Resource Inventory Area

1.0 Application

Application Type:	Non-Capacity Amendment of License
Date Filed:	May 31, 2023
Licensee's Name:	PacifiCorp
Water Body:	Yale Reservoir
Nearest Town:	Chelatchie
County and State:	Cowlitz County, Washington
Federal Lands:	No construction, staging, or access would occur on or through federal lands.

2.0 Purpose and Need

2.1 Background

Yale Saddle Dam was constructed in 1952. Several geotechnical investigations have since been conducted to evaluate potential project expansion, filter compatibility, and liquefaction potential. The most recent investigations and analyses, conducted in 2020 and 2021, identified seismic stability concerns with the dam embankment involving the potential for liquefaction of foundation materials. These investigations also inform the design of modifications or enhancements to the foundation or embankment.

The Yale Hydroelectric Project (Yale Project) is licensed by the Federal Energy Regulatory Commission (FERC) (Project No. 2071). The Yale Project is one component of the larger Lewis River Hydroelectric Development. The initial FERC license for the Yale Project was issued on April 30, 1951, and expired on April 30, 2001. The current license was issued under an Order Issuing New License on June 26, 2008, and expires May 31, 2058. Given the extent of seismic remediation construction to Yale Saddle Dam and the impact of such to other resources, PacifiCorp is seeking an amendment of the Project license.

2.2 Amendment Application

In compliance with 18 Code of Federal Regulations (CFR) Part 4, Subpart L, PacifiCorp is applying to FERC for a non-capacity amendment to the license for the Yale Project. Prior to submission of this application, PacifiCorp distributed a draft application to parties of the Lewis River Settlement Agreement for 90-day review and comment.

The draft application for license amendment was distributed to the following Tribes, resource agencies, and nongovernmental organizations for a 90-day comment period on December 8, 2022. Comments were due to PacifiCorp on March 8, 2023 (see 18 CFR § 4.38(a)(7)).

1. American Rivers
2. City of Woodland
3. Clark County
4. Confederated Tribes and Bands of the Yakama Nation*
5. Cowlitz County
6. Cowlitz Indian Tribe*
7. Cowlitz-Skamania Fire District No. 7
8. Fish First
9. Lewis River Aquatic Coordination Committee Representatives
10. Lewis River Citizens at-Large
11. Lewis River Community Council
12. National Marine Fisheries Service*
13. National Park Service
14. North Country Emergency Medical Service
15. Public Utility District No. 1 of Cowlitz County, Washington
16. Rocky Mountain Elk Foundation, Inc.
17. Skamania County
18. The Lower Columbia Fish Recovery Board
19. The Native Fish Society
20. Trout Unlimited
21. United States Department of Agriculture Forest Service*
22. United States Bureau of Land Management
23. United States Fish and Wildlife Service*
24. Washington Department of Ecology*
25. Washington Department of Fish and Wildlife*
26. Washington State Recreation and Conservation Office, formerly known as Washington Interagency Committee for Outdoor Recreation
27. Woodland Chamber of Commerce

* Denotes consultation party for purposes of 18 CFR § 4.38(a)(7).

Comments received in response to the draft application are summarized in the Response to Comments Table provided in the Consultation Record, Attachment B to Exhibit E of this license amendment application. Individual comment letters are also included.

2.3 Project Purpose

The purpose of the Yale Saddle Dam Seismic Remediation Project (proposed action) is to implement seismic remediation measures that improve the seismic performance of the dam based on the results from seismic stability evaluations presented in the *Yale Saddle Dam Existing Conditions Geotechnical Analyses Report* (AECOM 2022a). To determine the environmental effects and identify potential environmental measures that may be needed as a result of the proposed action, FERC staff will prepare an Environmental Assessment, which describes and evaluates probable environmental effects of the licensee's proposed action and a no-action alternative. The Environmental Assessment will provide a basis for FERC's action on the licensee's application for non-capacity amendment of license. This environmental report (Exhibit E of the Application for a Non-Capacity Related Amendment of License) will support FERC's Environmental Assessment.

3.0 Yale Hydroelectric Project Description and Operation

3.1 Overall Yale Hydroelectric Project Description

Components of the Yale Project include the reservoir (Yale Reservoir), the main embankment dam (Yale Dam), an earth-fill saddle dam (Yale Saddle Dam), power intake and tunnel, gated five-bay spillway, a powerhouse with two vertical turbine generator units with a combined capacity of 134 megawatts, and the 115-kilovolt Merwin-Yale transmission line.

The Yale Project is one of four hydroelectric projects located on the North Fork Lewis River, which also include the Merwin Project, the Swift No. 2 Project, and the Swift No. 1 Project. The Yale Project is located at the upstream end of Lake Merwin at river mile 34. The Yale Dam embankment is on the original Lewis River channel. Yale Saddle Dam is approximately 0.25 mile north of the Yale Dam on the north bank and contributes to the impoundment of Yale Reservoir.

The Yale Project boundary includes all shoreline recreational sites (Yale Park, Saddle Dam Park Day Use, Cougar Campground, Beaver Bay Campground); a narrow shoreline buffer around the reservoir; all Project development facilities (dams and powerhouse); the Speelyai diversion and canal; and the Merwin-Yale transmission line, which extends 10.5 miles from the Yale powerhouse to a substation near the Merwin Project.

The Yale Project boundary is shown in Figure 3-1.

3.2 Yale Hydroelectric Project Operation

The Yale Project typically operates as a peaking resource and provides grid stability balancing intermittent generation sources such as wind or solar. Typically, the Yale Project generates on demand throughout the day and is off-line (not generating) at night. Although, the full powerhouse capacity is 9,640 cubic feet per second (cfs), median monthly releases range from a peak of 6,500 cfs in December to a low of 1,300 cfs in August, with releases dropping to zero when off-line (FERC 2006).

3.3 Yale Reservoir and Yale Saddle Dam

Yale Reservoir is an in-stream reservoir created by the Yale Dam and Yale Saddle Dam. Primary inflow to the reservoir is from the Swift No. 2 powerhouse and Swift No. 2 ungated spillway, with additional flow contributions from Swift No. 1 spillway releases, Upper Speelyai Creek, Cougar Creek, Rain and Ole Creeks, and Siouxon Creek (FERC 2006).

The reservoir is approximately 10.5 miles long and has an approximate surface area of 3,800 acres, with a normal maximum operating elevation of 490 feet above mean sea level (amsl). The reservoir's gross storage capacity at this elevation is 402,000 acre-feet, with a usable storage capacity of 190,000 acre-feet. The drainage area for the reservoir is 596 square miles. Water levels are normally maintained between 480 and 490 feet amsl in summer for recreation uses, averaging 487 feet amsl, although daily fluctuations are generally less than 1 foot. Winter/spring elevations are relatively stable, with median monthly values averaging 475 feet amsl (FERC 2006; PacifiCorp 2020a). Given the current seismic concerns of Yale Saddle Dam, PacifiCorp is currently operating Yale Reservoir at a target maximum reservoir elevation of 480 feet amsl (10 feet below normal operating levels).

Yale Saddle Dam is approximately 2,000 feet long and has a maximum height of 37 feet, a 30-foot-wide crest, and 3 horizontal (H):1 vertical (V) side slopes. The dam crest is at an elevation of 503 feet amsl. The upstream slope is protected from erosion by a 2-to-3-foot layer of riprap, while the downstream slope has a grass surface.

4.0 Proposed Action and No-Action Alternatives

4.1 Licensee's Proposed Action

4.1.1 General Description of Proposed Action

The proposed seismic remediation project involves modifying the existing Yale Saddle Dam to address stability concerns identified in the recent seismic performance evaluations (AECOM 2022a). Figure 4-1 provides a general overview of the proposed action.

4.1.2 Modifications to Appurtenant Project Facilities

The existing dam is a zoned earthfill embankment that consists of an upstream and downstream shell surrounding a low permeability core. The dam embankment was not designed or constructed with an engineered filter and has been shown to be potentially susceptible to cracking during a seismic event. If a transverse crack extended through the dam below the operating water line, an uncontrolled release of the reservoir and dam failure could occur from erosion through the seismically induced crack. The proposed modifications to the dam include the following:

- A filter and drain berm constructed on the downstream face of the dam intended to protect the embankment should a seismically induced cracking event occur
- A shallow drainage collection ditch at the downstream dam toe intended to collect any seepage or infiltration into the filter drain system and discharging to a central drainage swale

- Riprap placement on the upstream side of the dam to augment the existing riprap and provide continuing protection against erosion from wave run-up
- Modifications to Saddle Dam Park Day Use recreational facilities to relocate existing facilities and in accordance with FERC license criteria due to additional rock filter and rock berm of the downstream embankment shell extending over the existing facilities footprint

4.1.2.1 Filter and Drain Berm and Drainage Swale

The filter and drain berm on the downstream face of the dam would consist of a two-stage chimney (sloped near-vertical section) and blanket (horizontal section) filter and drain overlain by rockfill cover material. The filter and drain berm would be installed on the existing 3H:1V downstream slope (following topsoil stripping), with a final grade downstream slope of 3.5H:1V. The new dam toe created by the filter and drain berm would extend to a point approximately 45 feet from the existing embankment toe. A toe ditch along the new downstream toe would collect and route seepage from the filter and drain berm to a central drainage swale connected to the toe ditch at the lowest point along the new downstream dam toe and extending downstream. Seepage analyses of the embankment's existing conditions and the modified dam cross section suggest that perennial seepage through the embankment and foundation would not be intercepted by the new filter drain system. The filter drain system is designed to filter piping as a result of a seismically induced crack within the embankment and safely discharge seepage collected downstream and away from the dam by means of the toe ditch and central drainage swale. Incidental infiltration from precipitation travelling through the rockfill embankment material would also be collected by the drainage system and be conveyed downstream and away from the dam by means of the toe ditch and central drainage swale.

The central drainage swale would be sloped at a 1 percent grade to convey drainage downstream and away from the dam embankment. The central drainage swale would include rock armament where the toe ditch from each side of the embankment discharges into it. The swale would be finished downstream with topsoil and seeded to create a grassy swale. The central drainage swale would be shaped as a trapezoid with an 8-foot bottom dimension and 3H:1V side slopes to facilitate mowing. The grassy swale would discharge drainage to the surface at a daylight point downstream in the Saddle Dam Park Day Use area.

4.1.2.2 Riprap Placement on Upstream Side of Dam

Riprap would be added to the upstream side of the dam from the toe of the embankment to near the crest. The new riprap would be blended with existing riprap materials to reestablish a nominal thickness of 2 feet, as originally designed and constructed. The riprap provides armoring to prevent erosion from wave run-up on the upstream slope of the dam. The reservoir would be temporarily drawn down during the winter months for a 2-week duration and to an elevation of 465 feet amsl to allow access for riprap placement (see Section 4.1.3.4).

4.1.2.3 Modifications to Recreational Facilities

The new filter and drain berm would extend the toe of the dam downstream and therefore occupy a portion of the existing downstream Saddle Dam Park Day Use area parking lot. The gravel

parking lot would be expanded and reconfigured to create a new parking lot approximately the same size as the existing lot. The reconfigured parking lot would include relocated grass vegetated islands and a relocated drainage swale similar to the existing features. Three existing park host sites would be relocated. No modifications to recreational facilities on the upstream side of the dam are planned; they would be protected in place or be replaced in-kind if necessary to accommodate construction.

Two septic tanks would be abandoned in place and replaced with new septic tanks in a new location. The existing septic tanks are associated with a septic cleanout station and discharge to a nearby leach field. The septic tanks to be abandoned would be pumped out and filled with concrete or sand, and the leach field would be abandoned in place. The new septic system (septic tanks and leach field) for a new septic cleanout station would be installed in a suitable location that considers the expanded parking lot footprint.

The existing asphalt accessible parking lot near the park restroom, the asphalt Americans with Disabilities Act (ADA)-accessible parking ramp and fence, and the concrete stairs and handrails extending from the parking lot on the downstream side of the dam would be demolished and reconstructed in-kind on the extended downstream face of the embankment.

4.1.3 Construction Activities

4.1.3.1 Access, Parking, Laydown Areas, and Equipment

Access to the construction site on the downstream side of the dam would be from Frasier Road via the 1000 Road and existing park entrance (Figure 4-2). Planned on-site temporary construction access roads would include a 24-foot-wide primary access road extending from the 1000 Road through the laydown areas, a 12-foot-wide secondary access road along the north side of the central drainage swale, and temporary ramps to access the dam from the north and south ends of the filter and drain berm. The temporary construction access roads would be lined with geotextile and 12 inches of aggregate base course.

Access to the upstream side of the dam for riprap rehabilitation would be via the existing boat ramp and along the upstream dam toe via a new layer of riprap bedding.

Existing parking areas along Frasier Road would be used for construction trailers and vehicle parking. The construction site would include four laydown areas on the downstream side of the dam, totaling approximately 14 acres (Figure 4-2). Similar to the temporary construction access roads, laydown areas would be lined with geotextile and 12 inches of aggregate base course. Laydown areas would be located more than 20 feet from the dripline of trees not designated for removal.

Construction equipment is expected to include conventional earth-moving equipment such as haul trucks, roller compactors, motor graders, front-end loaders, and excavators.

4.1.3.2 Construction Preparation

Preparatory work for construction would include installing construction fencing, implementing erosion and sediment controls, using BMP's, and establishing access roads and staging and stockpile areas. Demolition and site preparation activities would include removing existing recreational facilities, including the ADA ramp and fences.

The downstream face of the dam, part of the abutments, and central drainage swale would be cleared and grubbed of vegetation. An estimated 140 to 150 trees would be removed for the dam remediation project. Figure 4-3 shows the proposed tree removal areas. All tree removal would be mitigated for as described in Section 6.2.5.2.3.

4.1.3.3 Filter and Drain Berm, and Drainage Swale Installation

Construction of the dam modifications and central drainage swale would begin with stripping topsoil and excavating the existing dam embankment, downstream foundation area, and central drainage swale. Excavation would be followed by placing the filter sand, drain gravel, and rockfill cover materials, placing rock in the upstream end of the central drainage swale, and placing topsoil in the remaining length of the central drainage swale.

The sand filter, drain gravel, and rockfill materials would be imported from an off-site commercial source and would either be stockpiled on-site or transported directly to the embankment and placed. The fill materials would be placed and compacted concurrently in horizontal lifts from the foundation to the dam crest. Figure 4-4 and Figure 4-5 show the proposed dam excavation plan and proposed filter and drain berm plan and section, respectively.

4.1.3.4 Reservoir Drawdown and Riprap Rehabilitation

Upstream riprap rehabilitation would consist of placing the riprap bedding layer along the toe of the upstream embankment, followed by placing new riprap to amend the existing riprap and to cover areas of the upstream embankment slope without riprap protection. The riprap rehabilitation work would occur in four primary phases: reservoir drawdown, installation of erosion and sediment control, placement of riprap, and return of water level to normal operating pool elevations. Total amount of riprap to be placed below the 490-foot amsl max reservoir level will be approximately 3,620 cubic yards over an approximate area of 1.67 acres.

Phase 1 would involve drawing down the water level in the reservoir from the current maximum target water level of 480 feet amsl to an elevation of approximately 465 feet amsl.

When water levels in the reservoir reach the target elevations and water has drained from the construction work area, Phase 2 would begin with installation of temporary erosion and sediment control (TESC) measures around the construction work area to prevent the transport of sediments to adjacent in-water areas.

Access to the upstream side of the dam for Phase 3 of the riprap rehabilitation work would be via the existing boat ramp adjacent to the left abutment of the dam and along the upstream toe of the dam via a new layer of riprap bedding. The bedding would be placed 10 feet wide along the toe of the riprap rehabilitation area. The new bedding layer would form a base for placement of new riprap and large boulders removed from existing riprap. Riprap would be placed from the toe of

the embankment to near the crest to create a minimum total 2-foot layer excluding the existing riprap. The new riprap would be blended to create a smooth and visually complete transition to the existing rehabilitated riprap area on the north bank of the dam.

4.1.3.5 Construction Schedule

Construction would occur over a period of approximately 18 months after receipt of regulatory approvals. Assuming approvals are received in early in 2024, construction would commence after Labor Day in 2024, and conclude in the early months in 2026. The reservoir drawdown for riprap work is anticipated to occur during the winter, in December and/or January. This schedule may be modified depending on when all required regulatory approvals are actually received.

4.1.4 Site Reclamation

Site reclamation would include removing temporary geotextile and road base course from construction access roads and laydown areas, discing the underlying topsoil and/or placing stockpiled topsoil, hydroseeding, and final cleanup. Equipment would be demobilized following completion of construction. The equestrian trail where it crosses the right abutment of the dam (Figure 4-1) would be restored following project completion.

4.2 No-Action Alternative

Under the no-action alternative, FERC would not approve the non-capacity license amendment to construct the proposed seismic remediation project. No physical modification to Yale Saddle Dam would occur, and there would be no associated modifications to Saddle Dam Park Day Use area. 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. The Yale Saddle Dam would not be modified in a manner to improve its seismic stability consistent with purpose and need. However, the no-action alternative assumes that FERC would continue to require PacifiCorp to operate Yale Reservoir at a reduced maximum operating elevation of 480 feet amsl.

5.0 Agency Consultation and Compliance

5.1 Licensee's Pre-Filing Consultation

PacifiCorp has informed and consulted with parties to the Lewis River Settlement Agreement, and representatives of the Lewis River Terrestrial Coordination Committee and the Lewis River Aquatic Coordination Committee in preparing this application for FERC license amendment and has provided a draft application to parties of the Lewis River Settlement Agreement for a 90-day review and comment consistent with Section 15.3.2 of the Settlement Agreement and applicable FERC regulations. Comments received on the draft application and PacifiCorp responses to comments are included in the Consultation Record (Attachment B).

FERC has designated PacifiCorp as its non-federal representative for Endangered Species Act (ESA) Section 7 consultation and National Historic Preservation Act (NHPA) Section 106

consultation. Accordingly, PacifiCorp has initiated consultation with the National Marine Fisheries Service (NMFS), U.S. Fish and Wildlife Service (USFWS), and Washington Department of Archaeology and Historic Preservation (DAHP). These consultations are ongoing.

PacifiCorp has initiated, or plans to initiate, consultation with the agencies identified in Table 5-1 to acquire the necessary requirements, permits, or approvals for the proposed action.

Table 5-1 Resource Agency Review Required by the Licensee

Resource Agency	Requirements, Permits, or Approvals
U.S. Army Corps of Engineers	Section 404 of Clean Water Act, Nationwide Permit 31, Maintenance of Existing Flood Control Facilities (<i>Application submitted April 27, 2022</i>)
Washington State Department of Ecology	In-Water Work Protection Plan Approval per Clean Water Act Permit No. 3677 (<i>pending</i>)
National Marine Fisheries Service	Endangered Species Act, Section 7 Consultation (<i>pending</i>) Magnuson-Stevens Fishery Conservation and Management Act, Section 305b Essential Fish Habitat Consultation (<i>pending</i>)
U.S. Fish and Wildlife Service	Endangered Species Act, Section 7 Consultation (<i>pending</i>)
Washington State Department of Archaeology and Historic Preservation	National Historic Preservation Act, Section 106 Consultation (<i>pending</i>)
Washington Department of Fish and Wildlife	Hydraulic Project Approval (<i>pending</i>)
Cowlitz County	Shoreline Substantial Development Permit and Critical Areas Permit (<i>Application submitted April 27, 2022</i>) Washington State Environmental Policy Act Review/Determination (<i>Submitted as part of Shoreline Substantial Development Permit application</i>)

5.2 Statutory and Regulatory Compliance

5.2.1 Cowlitz County

5.2.1.1 Shoreline Management Program

Yale Reservoir is designated a Shoreline of Statewide Significance under the Shoreline Management Act of 1971. Within Cowlitz County, Yale Reservoir and all areas within 200 feet of the ordinary high water mark of Yale Reservoir are under the jurisdiction of the Cowlitz County Shoreline Management Program (SMP). Such areas include floodways and contiguous floodplain areas 200 feet landward from such floodways, and associated wetlands.

Under the Cowlitz County SMP, a Shoreline Substantial Development Permit (SSDP) is required for projects within 200 feet of the ordinary high water mark and/or within the 100-year floodplain of state-designated shorelines. PacifiCorp submitted an SSDP for the proposed action to Cowlitz County on April 27, 2022.

5.2.1.2 Critical Areas

Cowlitz County requires a “critical areas report” for proposed development activities in or adjacent to critical areas or associated buffers (Cowlitz County Code [CCC] Chapter 19.15.090).

PacifiCorp prepared and submitted (on April 27, 2022) a Wetland Delineation and Critical Areas Assessment Report to meet Cowlitz County critical areas assessment and reporting requirements in accordance with CCC Chapter 19.15 (Critical Areas), including the Level II Habitat Assessment requirements contained in CCC 19.15.130.C.30. Critical areas addressed in the report include wetlands, fish and wildlife habitat conservation areas (including streams, and shorelines subject to the Cowlitz County SMP), frequently flooded areas, geologically hazardous areas, and critical aquifer recharge areas.

5.2.1.3 Washington State Environmental Policy Act

Consistent with the requirement of Washington’s State Environmental Policy Act (SEPA), a SEPA Checklist was prepared and submitted on April 27, 2022 to Cowlitz County, which is the SEPA local lead agency.

5.2.2 Washington Department of Fish and Wildlife, Hydraulic Project Approval

The Washington Department of Fish and Wildlife (WDFW) requires a Hydraulic Project Approval for projects that use, divert, obstruct, or change the natural flow or bed of any of the salt or fresh waters of the state (Washington Administrative Code [WAC] 220.660.010). PacifiCorp will submit a Hydraulic Project Approval application for the proposed action.

5.2.3 U.S. Army Corps of Engineers, Section 404 Nationwide Permit

Section 404 of the Clean Water Act (CWA) requires that anyone intending to deposit or discharge dredged or fill material into navigable waters of the United States, including wetlands, must first receive authorization for such activities. Such discharges include return water from dredged material disposed on upland property and generally any fill material like rock, sand, or dirt. The U.S. Army Corps of Engineers (USACE) is responsible for administering the Section 404 permitting process. Activities in wetlands for which permits may be required include, but are not limited to, placement of fill material, ditching activities when the excavated material is side-cast, levee and dike construction, mechanized land clearing, land leveling, road construction, and dam construction.

When issuing a permit, the USACE will require consultation under ESA Section 7, Essential Fish Habitat (EFH) consultation under the Magnuson-Stevens Fishery Conservation Management Act (MSA), and consultation under NHPA Section 106. As FERC’s non-federal representative for these consultations, PacifiCorp will coordinate with the USACE to ensure such consultations cover potential USACE actions.

The proposed action requires a Section 404 permit from the USACE because the project would include the addition of riprap fill below the ordinary high-water line (OHWL) of Yale Reservoir. On April 27, 2022, PacifiCorp applied for a Section 404 permit from the USACE, and the application is currently being processed. At the time of this analysis, PacifiCorp has not yet received regulatory authorization for impacts to Yale Reservoir under Nationwide Permit 31, for maintenance of existing flood control facilities.

5.2.4 Washington State Department of Ecology, Section 401 Water Quality Certification

Under Section 401(a)(1) of the CWA, FERC may not issue a license for a hydroelectric project unless the state water quality certifying agency has issued a water quality certification for the project or has waived certification by failing to act within a reasonable period of time, not to exceed 1 year. Section 401(d) of the CWA provides that state certification shall become a condition of any federal license that authorizes construction or operation of the project.

On February 3, 2005, PacifiCorp applied to the Washington State Department of Ecology (Ecology) for Section 401 water quality certification associated with Yale Project licensing. PacifiCorp subsequently withdrew and refiled its application on December 2, 2005. On October 9, 2006, Ecology issued the certification (Ecology 2006). Pursuant to Section 4.1(9) of the water quality certification, Ecology issued amendments on December 21, 2007, and January 17, 2008. Consequently, PacifiCorp obtained a 401 certification for the Yale Project that covers the proposed action. Section 4.5.2(b) of the water quality certification requires preparation of an in-water work protection plan (IWWPP) to protect water resources during in-water work activities. PacifiCorp is currently developing an IWWPP to demonstrate compliance with the existing Section 401 water quality certification for the Yale Project.

5.2.5 Endangered Species Act, Section 7

Section 7 of the ESA requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. The Biological Opinions for the FERC relicensing of the Lewis River Hydroelectric Projects, published by USFWS in 2006 and by NMFS in 2007, address most activities under the proposed action (USFWS 2006; NMFS 2007).

PacifiCorp is currently preparing supplemental ESA documentation to address aspects of the proposed action that are not addressed in the prior Biological Opinions. PacifiCorp has initiated Section 7 consultation with NMFS and USFWS.

5.2.6 Magnuson-Stevens Fishery Conservation Management Act

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires that regional Fishery Management Councils, through federal Fishery Management Plans, describe and identify EFH for each federally managed species; minimize, to the extent practicable, adverse effects on such habitat caused by fishing; and identify other actions to encourage the conservation and enhancement of such habitats. Congress defines EFH as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity” (16 United States Code 1802[10]). Habitats used at any time during a species’ life cycle (i.e., during at least one of its life stages) must be accounted for when describing and identifying EFH. The NMFS Biological Opinion for the FERC relicensing of the Lewis River Hydroelectric Projects, which was published in 2007, addresses EFH (NMFS 2007).

5.2.7 *National Historic Preservation Act, Section 106*

Section 106 of the NHPA requires that FERC evaluate the potential effects of the proposed undertaking on properties listed or eligible for listing in the National Register of Historic Places (National Register). Such properties listed or eligible for listing in the National Register are called historic properties. Section 106 also requires that FERC seek concurrence with the State Historic Preservation Officer on any finding of effect or no effect on historic properties and allow the Advisory Council on Historic Preservation (ACHP) an opportunity to comment on any finding of effects on historic properties. If Native American properties have been identified, Section 106 also requires that FERC consult with interested Tribes that might attach religious or cultural significance to such properties.

In assessing the proposed action, FERC will evaluate whether any historic properties may be affected within the project's area of potential effects and allow the ACHP an opportunity to comment. To assist FERC in this evaluation, PacifiCorp has prepared a cultural resources summary memorandum to evaluate the potential effects on cultural resources resulting from the Saddle Dam Seismic Remediation project, focusing specifically on the portions of the action area where effects may occur. The memorandum provides an overview of the regulatory context, a summarization of previous investigations, and a brief analysis of potential impacts to historical and archaeological resources. The Cultural Resources Summary for the Saddle Dam Seismic Remediation Project will be submitted for review under separate cover, due to the sensitivity of the information provided.

5.2.8 *Pacific Northwest Power Planning and Conservation Act, Section 4(h)*

Under Section 4(h) of the Pacific Northwest Power Planning and Conservation Act, the Northwest Power Planning Council developed the Columbia River Basin Fish and Wildlife Program (Program) to protect, mitigate, and enhance the fish and wildlife resources associated with development and operation of hydroelectric projects in the Columbia River basin. Section 4(h) states that responsible federal and state agencies should provide equitable treatment for fish and wildlife resources, in addition to other purposes for which hydropower is developed, and that these agencies should take the Program into account to the fullest practical extent. The Program directs agencies to consult with fish and wildlife managers and the Northwest Power Planning Council during the study, design, construction, and operation of any hydroelectric development in the basin (Sections 12.1A. through 12.1A.2). As described above, PacifiCorp is consulting with affected Tribes and wildlife agencies pursuant to the Lewis River Settlement Agreement and FERC regulations and will provide these groups with opportunities to review and comment on the application.

5.2.9 *Federal Power Act, Section 4(e) Conditions*

Section 4(e) of the Federal Power Act requires any license issued by FERC for a project located within a federal reservation to 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 Yale Project occupies federal lands administered by the Bureau of Land Management.

5.2.10 Coastal Zone Management Act

Cowlitz County is not considered a coastal county of the State of Washington. Therefore, this regulatory requirement is not applicable to the proposed action.

6.0 Environmental Analysis

6.1 General Description of Project Area

The project area includes Yale Saddle Dam, Yale Reservoir, and portions of Saddle Dam Park Day Use Area and Saddle Dam Farm. Figure 6-1 provides a general overview of the project area, and Figure 6-2 shows existing conditions in the project area.

Yale Saddle Dam is located on the shoreline of Yale Reservoir. A dirt path traverses the crest of the dam. The downstream face of the dam is covered with mowed grass. As designed, the upstream face of the dam is covered by grass on the upper portion, transitioning to riprap down the slope and extending to the toe. The reservoir is generally devoid of vegetation adjacent to the toe of the dam, and the reservoir bed is covered in mud and silt, with the exception of patches of aquatic vegetation such as Canadian waterweed (*Elodea canadensis*) in shallow areas.

Yale Reservoir is approximately 10.5 miles long and has a surface area of approximately 3,800 acres at elevation 490 feet amsl, the normal maximum reservoir level (i.e., full pool elevation or OHWL). However, the maximum operating level is currently restricted to 480 feet amsl (10 feet below normal operating levels) as a mitigation measure for the current seismic stability concern.

The Saddle Dam Farm area west of the dam contains a large, regularly mowed field with scattered trees and is surrounded by forest. The field is vegetated predominantly with non-native grasses and forbs. This portion of the general area is the site of the Frasier homestead, and remnant orchards from the homestead are still present. Saddle Dam Farm is managed as part of the Lewis River Wildlife Habitat Management Plan (WHMP) as important foraging habitat for Roosevelt elk (*Cervus canadensis roosevelti*). The fields are managed specifically as a source of forage for elk, with hedgerows breaking up line-of-site and providing browse.

Frasier Creek and associated diversion channels, ponds, and wetlands occur along the west side of the park, and Stream 4 (also known as Saddle Dam Creek), is a seasonal stream, and flows into Yale Reservoir in the northeast corner of the project area.

6.2 Resource Areas and Analysis

6.2.1 *Geology and Soil Resources*

6.2.1.1 *Affected Environment*

Numerous geologic and geotechnical studies have been prepared related to the planning and construction of the Yale Dam and Yale Saddle Dam, beginning in the 1920s. The summary of site geology below is taken from the most recent Geotechnical Data Report (AECOM 2022b), which reviews and appends several of the previous studies.

The Yale Saddle Dam site is in the Lewis River Valley at the southern end of Yale Reservoir, approximately 1,000 feet north of the Yale Dam spillway. The Lewis River drains a portion of the western slope of the Cascade Range in southwestern Washington, including several tributaries that originate on the southern and eastern flanks of Mount St. Helens, an active volcano. Mount St. Helens has experienced multiple episodes of volcanic activity in the past 50,000 years, several of which have contributed volcanoclastic sediment to the Lewis River drainage. The most recent (current) episode includes the large volcanic debris avalanche and associated lahars (debris flows primarily composed of volcanic material) that accompanied the May 1980 eruption, which removed a significant portion of the northern flank and summit of the volcano. Although the 1980 eruption and subsequent events have not substantially affected the Lewis River (on the opposite side of the mountain from the destructive, northward-directed eruption), evidence exists of past similar events that have affected the Lewis River basin and the volcanically derived sediments present at the Yale Saddle Dam site.

Yale Saddle Dam is underlain by soils derived from volcanoclastic, glacio-fluvial, and alluvial sediments that have been emplaced in the past 50,000 years. These soils were deposited by lahars, lahar run-out flows (i.e., sediment-rich flows, generally devoid of coarse gravel, which represent the distal portions of lahars), ash fall, Cascade alpine glaciers, and the ancestral and modern Lewis River alluvial processes. Alluvial deposits more than 30 feet thick, interbedded with lahar flows, have been observed along the western shoreline of Yale Reservoir upstream of Yale Saddle Dam (Major and Scott 1988).

The relatively thick sequence of volcanically derived sediment that is present beneath and downstream from Yale Saddle Dam (locally greater than 120 feet thick) is composed primarily of poorly graded sand, silty sand (with gravel), sandy silt, well-graded gravel with sand, and clayey gravel with sand. The upper alluvial unit and the transition layer have highly variable and unusual engineering properties attributed to the presence of minerals derived from chemical weathering of the volcanic sediments and glass. Soils in this area have been mapped by the Natural Resources Conservation Service as Andisols, which developed in volcanic ash or other volcanic ejecta (NRCS 2022). The area immediately downstream of Yale Saddle Dam, including Saddle Dam Park Day Use and Saddle Dam Farm, is mapped as Cinebar silt loam, which developed in volcanic ash overlying glaciofluvial deposits.

Yale Saddle Dam spans a topographic low, separated from the current main channel of the Lewis River by a bedrock high of Tertiary volcanic rocks. In the left abutment of Yale Saddle Dam, these rocks consist primarily of volcanic breccia. The steep mountain slopes north and east of Yale

Saddle Dam are mapped as Newaukum gravelly and cobbly silt loams, which formed in colluvium and glaciofluvial deposits with an admixture of volcanic ash. Tertiary volcanic rocks (basaltic andesite) underlie the glaciofluvial deposits (WDNR 2022). Slope gradients in this area range up to 45 percent. Cowlitz County recognizes these steep slopes as geologically hazardous areas (AECOM 2022c) because they are susceptible to soil erosion. Potential erosion hazard on Newaukum soils on slopes over 30 percent is severe (NRCS 2022). Cowlitz County EPIC Mapper (2022) does not indicate or map any deep-seated landslides, deep-seated landslide scarps, or potentially unstable slopes in the vicinity of Yale Saddle Dam.

The project area is located in a liquefaction area with low to moderate susceptibility for liquefaction during a seismic event (Palmer et. al 2004). Liquefaction susceptibility is an estimate of the likelihood that soil would liquefy as a result of earthquake shaking. The proposed action is intended to mitigate for potential liquefaction hazards associated with the current design of Yale Saddle Dam.

6.2.1.2 Environmental Effects

6.2.1.2.1 Construction-Related Effects

Construction activities under the proposed action would primarily impact Yale Saddle Dam, Saddle Dam Park Day Use and Saddle Dam Farm. Total volumes of excavation and fill are estimated at approximately 20,000 cubic yards and 92,500 cubic yards, respectively. All fill materials would either be reused materials from the project or imported from an off-site commercial source. There is no borrow pit associated with the project. Materials would either be stockpiled on-site or transported directly to the dam embankment and placed. Approximately 12 acres would be disturbed at the modified dam area and central drainage swale.

The proposed construction footprint would avoid the steep slopes west of Frasier Creek and north of Yale Saddle Dam. Nevertheless, disturbance, removal, stockpiling, and transporting this volume of soils and fill materials could result in runoff and erosion into Yale Reservoir and/or Frasier Creek, especially if significant precipitation events were to occur during construction.

Construction is scheduled to last approximately 18 months, during which significant precipitation events are likely to occur. Impacts associated with construction activities would be short term in duration. Potentially significant impacts would be avoided through the implementation of proposed protection measures discussed in Section 6.2.1.2.3.

6.2.1.2.2 Operations-Related Effects

The proposed action to perform a seismic rehabilitation of Yale Saddle Dam would not result in operational changes to the dam or the larger Lewis River Hydroelectric Project. Following construction, the normal maximum operating elevation of the reservoir would revert to 490 feet amsl, and no additional lands would be inundated or subject to shore erosion. Any shoreline erosion is likely to be reduced by the placement of supplemental riprap on the upstream face of the dam. The long-term effects of the proposed action would be beneficial because the project would reduce the risk of catastrophic failure of the dam during a seismic event.

6.2.1.2.3 Proposed Protection Measures and Analysis

PacifiCorp proposes the following measures to minimize impacts to geology and soil resources:

- Appropriate best management practices (BMPs) would be utilized and maintained to minimize the transport of soils and sediments outside of the limits of construction. The construction contractor would be required to comply with a TESC plan that would be implemented to manage construction stormwater runoff during construction. The TESC plan would comply with conditions contained in the construction stormwater general permit that would be obtained for the project.
- The limit of disturbance would be clearly marked on the ground. Orange construction fencing and signage would be erected along laydown area boundaries and for exclusion of sensitive areas such as wetlands. The construction contractor would be responsible for restoring laydown areas to the pre-existing grade and condition.
- Existing fill material removed from the dam face, including the ADA ramp, would be transported off-site and disposed of at an approved disposal facility. Existing topsoil removed from the dam face would be reused on-site where feasible, and the remainder would be transported off-site for disposal at an approved disposal facility.

6.2.1.3 Effects of the No-Action Alternative

The no-action alternative assumes that Yale Reservoir would be restricted to a maximum operation elevation of 480 feet amsl, and no action (i.e., construction) would be completed at Saddle Dam. This would have no effect on geology and soil resources.

6.2.2 Water Quantity

6.2.2.1 Affected Environment

Yale Reservoir (also known as Yale Lake) is a 3,800-acre reservoir formed by Yale Dam, located in Water Resource Inventory Area (WRIA) 27 (Lewis). The Yale Dam was completed in 1953. The reservoir is approximately 10.5 miles long and has a normal maximum operating level of 490 feet amsl (PacifiCorp 2020a). At this level, the reservoir's gross storage capacity is 402,000 acre-feet, with a usable storage capacity of 190,000 acre-feet. Yale Reservoir is currently restricted to 480 feet amsl. The normal operating reservoir elevation is between 470 and 490 feet amsl, although reservoir levels drop as low as 460 feet amsl on a yearly basis during winter months. The minimum operating elevation is 430 feet amsl (PacifiCorp 2020a). The drainage area for the reservoir is 596 square miles. The forebay of the Yale Dam is downstream of Yale Reservoir, and water from the reservoir is discharged into Merwin Lake via the tailrace at Yale Dam.

The Yale Project is one component of the larger Lewis River Hydroelectric Project, which is operated to achieve optimum benefits for power production and flood management and to provide for resources such as fish, wildlife, and recreation (PacifiCorp 2020a). Yale Reservoir, along with two other Lewis River reservoirs, store and release water as needed to meet hydroelectric project needs. The Lewis River system is fed by precipitation and spring snowmelt from the Cascade Range; therefore, the amount of water entering the drainage can vary depending on climatic

conditions, and during drought years there may be persistent low water levels that affect water levels throughout the Lewis River system (PacifiCorp 2019).

Based on data from 2019 to 2021 (USGS 2022a), the annual water surface elevation for Yale Reservoir has averaged between 475 and 478 feet amsl. Based on monthly mean data (USGS 2022b), water levels in the reservoir are generally highest in late spring and early summer and lowest in late fall. During the fall and winter months, reservoir levels are variable due to management for flood control and power generation. During the summer recreation season, PacifiCorp attempts to maintain relatively high stable water levels in Yale Reservoir (FERC 2006). A wetland and waters delineation for the project in April 2020 identified four streams, two constructed ponds, and three wetlands in the project vicinity (AECOM 2022c). Wetlands, streams, and ponds are also discussed in Section 6.2.5.

Frasier Creek is a perennial stream west of the project area that flows roughly north-south from hillslopes to the northwest. Water from this stream is partially diverted via two created diversion channels to two ponds that were constructed to provide wildlife habitat. There is no surface water connection between these aquatic features and Yale Reservoir in the project vicinity; Frasier Creek eventually flows into the Lewis River downstream of Yale Dam and the project area.

Stream 4 (Saddle Dam Creek) is an intermittent second-order stream that enters the project area from over a basalt cliff and flows into Yale Reservoir near the northeastern end of the Yale Saddle Dam. This stream comes within 45 feet of the area of riprap rehabilitation.

6.2.2.2 Environmental Effects

6.2.2.2.1 Construction-Related Effects

During construction, PacifiCorp would route water away from Yale Reservoir to other portions of the Lewis River system to temporarily lower the water level in the reservoir to 465 feet amsl. This water level is below the normal minimum operating elevation (470 feet amsl) but above the minimum operating elevation (430 feet amsl). No surface water withdrawals or diversions outside the Lewis River system would occur. The water quantity in the delineated streams, ponds, and wetlands would not be affected by the project because no work would occur in these features. In addition, TESC measures would be implemented to minimize stormwater runoff in order to protect these areas that lie outside the construction limits of the project. Effects to water quantity would be localized and would occur only during the 2-week period in the winter when upstream riprap rehabilitation work would take place.

Water would be needed for fill moisture conditioning during the placement of fill for the dam embankment. Water would be delivered to the site from commercial sources if needed. A consumptive water right for use from the reservoir could also be pursued.

6.2.2.2.2 Operations-Related Effects

The proposed action to perform a seismic rehabilitation of Yale Saddle Dam would not result in operational changes to the dam or the larger Lewis River Hydroelectric Project. The reservoir would return to a normal maximum operating level of 490 feet amsl, so no other effects to water quantities within the Lewis River system are anticipated.

This project provides a beneficial impact by reducing the risk of seepage through the dam from a large magnitude seismic event, which would affect the ability to store water in Yale Reservoir.

6.2.2.2.3 Proposed Protection Measures and Analysis

Because the drawdown would be temporary and above the minimum operating elevation (430 feet amsl), no protection measures would be necessary. However, PacifiCorp proposes to minimize the effects of the reservoir drawdown on resources that rely on water quantity by conducting the drawdown during a 2-week period in the winter (in December and/or January) when it is assumed the least amount of fish and fish habitat would be affected (see Section 6.2.4).

6.2.2.3 Effects of the No-Action Alternative

The no-action alternative assumes that Yale Reservoir would be restricted to a maximum operation elevation of 480 feet amsl, and no action (i.e., construction) would be completed at Saddle Dam. This would affect reservoir water quantities in the larger Lewis River system and how PacifiCorp manages those reservoir water quantities to maintain normal operating levels. Operating at the lower reservoir level of 480 feet amsl will affect power generation over the long-term.

6.2.3 Water Quality

6.2.3.1 Affected Environment

Based on water quality standards promulgated in WAC 173-201A, Yale Reservoir is designated for all fresh water beneficial uses, which include the following (Ecology 2022a):

- Aquatic life uses (core summer salmonid habitat)
- Recreational uses (primary contact recreation)
- Water supply uses (domestic, agricultural, industrial, and stock watering)
- Miscellaneous uses (wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics)

Associated water quality standards to maintain these uses include a maximum temperature of 16°C (60.8°F), minimum dissolved oxygen of 10 milligrams per liter, pH between 6.5 and 8.5, and maximum turbidity 5 nephelometric turbidity units (NTU) over background (for background 50 NTU or less) or a 10 percent increase in turbidity (for background greater than 50 NTU) (WAC 173-201A; Ecology 2022a).

Per the Washington State Water Quality Assessment, there are no 303(d) or other water quality listings in the project vicinity for Yale Reservoir or other waters. The stretch of the Lewis River just downstream of Yale Dam, near the tailrace, is listed as Category 4B and has a pollution control plan in place for total dissolved gas. This area has also been tested for temperature and meets the standards (Ecology 2022a). A segment of the Lewis River about 0.75 mile downstream of the Yale powerhouse is listed as a water of concern for total dissolved gas (Ecology 2022a). These water quality concerns are associated with operation of the dam.

There are no documented groundwater quality concerns in the project vicinity (Ecology 2022b). Based on mapping from Cowlitz County (Cowlitz County 2022), there are no wellhead protection zones or critical aquifer recharge areas mapped in the project vicinity. The closest wellhead protection zones and associated critical aquifer recharge areas are approximately 900 feet south of the project disturbance limits.

6.2.3.2 Environmental Effects

6.2.3.2.1 Construction-Related Effects

During the construction period, short-term, localized water quality impacts could occur if sediment, debris, stormwater, or unintentional releases from construction work and staging areas were to enter project area waters. The design of project and construction layout sites is intended to avoid water quality impacts to Frasier Creek and associated ponds and channels, as construction disturbance limits would be greater than 200 feet from these waters. Riprap rehabilitation in the vicinity of Stream 4 would have the potential to result in the release of sediments into the stream. These risks would be minimized through implementation of BMPs to minimize the transport of silt and sediments outside of construction limits and preparation of a TESC plan to manage construction stormwater runoff. The TESC plan would comply with conditions contained in a construction stormwater general permit obtained for the project. A Spill Prevention, Control, and Countermeasure Plan (SPCCP) would be developed and implemented to minimize the risk of water quality contamination from spills of diesel, gas, oil, or hydraulic fluid.

Riprap rehabilitation work would have the potential to impact water quality in Yale Reservoir through the release of sediment and other construction pollutants. Drawdown of the reservoir would allow the work to be conducted during dry conditions and would avoid stirring up lakebed sediments in the water column. In addition, no equipment would drive across the lakebed during construction or riprap replenishment activities.

6.2.3.2.2 Operations-Related Effects

The proposed action to perform a seismic rehabilitation of Yale Saddle Dam would not result in operational changes to the dam or the larger Lewis River Hydroelectric Project, with the exception of allowing the reservoir to return to a normal maximum operating level of 490 feet amsl. No operational effects to water quality above baseline levels are anticipated during project operations.

The existing septic system and leach field would be decommissioned and replaced with a new septic system in a different location. Potential risks to groundwater quality from the septic system are expected to be similar to those at present.

6.2.3.2.3 Proposed Protection Measures and Analysis

As described above, proposed measures to protect water quality include construction BMPs designed to prevent the movement of sediment from construction sites, a TESC plan and associated measures to manage stormwater runoff, and an SPCCP. Sediment ponds or suitable BMPs would be installed as needed to control the transport of silt and sediments outside of the limits of construction.

6.2.3.3 Effects of the No-Action Alternative

Under the no-action alternative, PacifiCorp would maintain a maximum operating elevation of 480 feet amsl for Yale Reservoir indefinitely, or until seismic concerns are addressed for the Yale Saddle Dam. The no-action alternative would have no impact on most water quality standards, including temperature, dissolved oxygen, and pH. Erosion and transport of newly exposed unvegetated sediments could result in localized increases in turbidity in the reservoir over the short term. However, these impacts would be expected to lessen over time as new vegetation establishes.

6.2.4 Fisheries and Other Aquatic Resources

6.2.4.1 Affected Environment

Fish known to occur in Yale Reservoir and its tributaries include coho (*Oncorhynchus kisutch*) kokanee (landlocked sockeye salmon) (*O. nerka*), bull trout (*Salvelinus confluentus*), resident rainbow trout (*O. mykiss*), resident coastal cutthroat trout (*O. clarkii clarkii*), northern pikeminnow (*Ptychocheilus oregonensis*), brook trout (*S. fontinalis*), mountain whitefish (*Prosopium williamsoni*), sculpin (*Cottoidea* sp.), three-spine stickleback (*Gasterosteus aculeatus*), and largescale sucker (*Catostomus macrocheilus*). Kokanee are not native to the Lewis River basin but were introduced following dam construction to enhance the recreational fishery. Kokanee, bull trout, and rainbow trout are state priority fish species. Bull trout and coho, which are federally listed threatened species, are discussed in Section 6.2.6.

Yale Reservoir is mapped as having historical populations of naturally spawning Lower Columbia River Chinook salmon (*O. tshawytscha*) (federally listed as threatened) and steelhead trout (*O. mykiss*) (federally listed as threatened). This habitat is currently considered blocked by the major dams on the Lewis River (FERC 2006). However, both species have been observed in Yale Reservoir having passed down from Swift Reservoir, which is now available habitat for these species. These federally listed threatened species are also discussed in Section 6.2.6.

Amphibians that may occur in the project area are discussed in Section 6.2.5.

6.2.4.2 Environmental Effects

6.2.4.2.1 Construction-Related Effects

The reservoir would be drawn down to an elevation of 465 feet amsl, within normal operating levels for the reservoir, to facilitate the placement of riprap on the upstream face of the dam along the shoreline. PacifiCorp anticipates conducting the drawdown during a 2-week period in December and/or January during periods of normally low reservoir pool elevations. The drawdown would follow a ramp rate of no more than 1-footft per hour until target reservoir elevation is met. The proposed drawdown elevation is unlikely to result in a loss of unique habitat for fish or result in fish stranding. There would be a temporary loss of linear feet of habitat from the minimized circumference of the reservoir. However, it is assumed conducting the drawdown during the winter months would minimize impacts to fish due to the loss of littoral habitat, as most fish species that over-winter in the reservoir move into the deeper pelagic zones during this time. Construction activities on the shoreline and below the OHWL in the reservoir may result in elevated sediment levels in the reservoir and could result in short-term impacts to aquatic species.

6.2.4.2.2 Operations-Related Effects

As discussed in Section 3.3, the normal maximum operating elevation of the reservoir is 490 feet amsl. During the summer, water levels are normally maintained between 480 and 490 feet amsl, averaging 487 feet amsl, with daily fluctuations of generally less than 1 foot. During the winter and spring, water levels are normally maintained at 475 feet amsl on average. Currently, the reservoir is restricted to a maximum operating elevation of 480 feet amsl. Following construction, the normal maximum operating elevation of the reservoir would revert to 490 feet amsl, and the project would continue to operate under the terms and conditions of the existing license. Reverting to a normal maximum operating elevation of 490 feet amsl would increase the linear feet of shoreline and available habitat for fish during the summer months compared to current operations. No other effects to fish and other aquatic resources are anticipated.

6.2.4.2.3 Proposed Protection Measures and Analysis

PacifiCorp proposes the following measures to minimize impacts to fish and other aquatic resources:

- To minimize potential impacts to fish and fish habitat, the reservoir drawdown would be conducted during a 2-week period in the winter, in December and/or January, when it is assumed most fish that overwinter in the reservoir move to deeper zones. The drawdown would occur at no greater than 1-foot per hour until target reservoir level is attained.
- To mitigate for potential fish stranding during drawdown of the reservoir, PacifiCorp would deploy crews by boat to survey strategic locations around the reservoir once the drawdown elevation is reached, and conduct fish salvage as needed. Locations would be identified through the use of bathymetric maps of the reservoir, as well as local knowledge.
- To minimize the potential for elevated sediment levels in the reservoir from construction activity along the shoreline and below the OHWL, suitable BMPs would be installed to minimize the transport of silt and sediments outside of the limits of construction.
- The construction contractor would be required to comply with a TESC plan that would be implemented to manage construction stormwater runoff. The TESC plan would comply with conditions contained in the construction stormwater general permit that would be obtained for the project.

6.2.4.3 Effects of the No-Action Alternative

Under the no-action alternative, PacifiCorp would maintain a maximum operating elevation of 480 feet amsl for Yale Reservoir indefinitely, or until seismic concerns are addressed for the Yale Saddle Dam. This would result in a continued and long-term loss of linear feet of habitat during the summer months from the minimized circumference of the reservoir and loss of littoral habitat but is not expected to result in a loss of unique habitat for fish. The loss of habitat during the summer months could impact bull trout, Chinook salmon, steelhead, and other fish that occur in Yale Reservoir.

6.2.5 Wildlife, Botanical, and Wetland Resources

6.2.5.1 Affected Environment

6.2.5.1.1 Wildlife

More than 100 bird species have been documented in the general project area, including passerine birds (e.g., thrushes, warblers, and chickadees), woodpeckers, raptors (e.g., owls, hawks, eagles, and falcons), herons, grebes, loons, and shorebirds (e.g., gulls) (FERC 2006). State priority bird species that have been documented in the Frasier Creek wetlands, on Yale Pond (south of Lewis River) or Yale Reservoir, or in the project vicinity include northern spotted owl (*Strix occidentalis caurina*), common loon (*Gavia immer*), bufflehead (*Bucephala albeola*), dusky grouse (formerly, blue grouse; *Dendragapus obscurus*), great blue heron (*Ardea herodias*), hooded merganser (*Lophodytes cucullatus*), Vaux's swift (*Chaetura vauxi*), and wood duck (*Aix sponsa*). Northern spotted owl, a federally listed threatened species, is discussed further in Section 6.2.6.

Bald eagles (*Haliaeetus leucocephalus*), protected under the Bald and Golden Eagle Protection Act, use the project vicinity for wintering and breeding. One bald eagle nest and two bald eagle roost core areas are documented within 1 mile of the project area. The bald eagle nest and one of the bald eagle nest roost core areas are located approximately 0.9 mile south of the project area on the south side of the Lewis River; the other bald eagle roost core area is located approximately 0.9 mile southeast of Saddle Dam Park Day Use area.

Mammals known to occur in the general project area include Roosevelt elk, deer, Douglas squirrel, Townsend's chipmunk, beaver, mink, black bear, bobcat, river otter, and coyote. Raccoon and other small mammal and bat species are also likely to occur. Columbia black-tailed deer and Roosevelt elk are state priority mammal species that have been documented in the project vicinity. There are over 200 Roosevelt elk in the Yale Reservoir valley, which is used for wintering habitat, and elk are known to use the fields and meadows within the Saddle Dam Farm year-round. The WDFW designates Roosevelt elk as a species of recreational, commercial, or tribal importance that is vulnerable and a state priority species.

Larch Mountain salamander (*Plethodon larselli*) (a state-listed sensitive species) is known to occur within 1 mile of the project area, but no occurrences have been documented on Yale Saddle Dam or within the Saddle Dam Park Day use area.

Federal or state endangered, threatened, candidate, sensitive, and priority wildlife species that have a primary association with habitat on or adjacent to the project area (within 300 feet) are listed in Table 6-1. Threatened and endangered species are discussed further in Section 6.2.6.

Table 6-1 Endangered, Threatened, Candidate, Sensitive, and Priority Species with a Primary Association with Habitat in or Adjacent to the Project Area

Species	Federal Status	State Status ¹	Habitat in Project Vicinity ²
BIRDS			
Northern spotted owl (<i>Strix occidentalis caurina</i>)	Endangered	Endangered	Suitable habitat in forested areas adjacent to project area.
Common loon (<i>Gavia immer</i>)	None	Sensitive (breeding areas, migratory stopovers, regular concentrations)	Found on Yale Reservoir; breeding unlikely due to lack of suitable habitat.
Bufflehead (<i>Bucephala albeola</i>)	None	Priority Species (breeding areas)	Observed on project reservoir wetlands in winter; no known nesting.
Hooded merganser (<i>Lophodytes cucullatus</i>)	None	Priority Species (breeding areas)	Observed breeding in Frasier Creek/wetlands.
Wood duck (<i>Aix sponsa</i>)	None	Priority Species (breeding areas)	Observed breeding in Frasier Creek/wetlands.
Dusky grouse (formerly, blue grouse) (<i>Dendragapus obscurus</i>)	None	Priority Species (breeding areas, regular concentrations)	Observed in Yale Project vicinity.
Great blue heron (<i>Ardea herodias</i>)	None	Priority Species (breeding areas)	Common along Yale Reservoir and in wetlands. No known breeding sites.
Vaux's swift (<i>Chaetura vauxi</i>)	None	Priority Species (breeding areas, communal roosts)	Observed on lands near Yale Project.
MAMMALS			
Columbia black-tailed deer (<i>Odocoileus hemionus columbianus</i>)	None	Priority Species	Wintering habitat on and adjacent to project area.
Roosevelt elk (<i>Cervus canadensis roosevelti</i>)	None	Priority Species	Wintering habitat on and adjacent to project area.

Species	Federal Status	State Status ¹	Habitat in Project Vicinity ²
AMPHIBIANS			
Cascade torrent salamander (<i>Rhyacotriton cascadae</i>)	Petitioned for listing	Candidate	Found in tributary streams/seeps to Yale Reservoir.
Larch Mountain salamander (<i>Plethodon larselli</i>)	None	Sensitive	Large population on face of nearby Yale Dam and base of an adjacent cliff; none documented at Saddle Dam/Park.

¹ WDFW 2021a, 2021b

² FERC 2006; NMFS 2007, 2016; PacifiCorp 2021a; WDFW 2021a; USFWS 2010

6.2.5.1.2 Botanical Resources

Upland herbaceous habitat in the project area contains mostly non-native grasses and forbs. The field west of Yale Saddle Dam has been periodically seeded with a mix of perennial ryegrass (*Lolium perenne*), orchardgrass (*Dactylis glomerata*), and white clover (*Trifolium repens*) (PacifiCorp 2008). Other common grasses include creeping bentgrass (*Agrostis stolonifera*), sweet vernalgrass (*Anthoxanthum odoratum*), annual bluegrass (*Poa annua*), and common velvetgrass (*Holcus lanatus*). Common herbs include Queen Anne's lace (*Daucus carota*), hairy cat's-ear (*Hypochaeris radicata*), ox-eye daisy (*Leucanthemum vulgare*), common dandelion (*Taraxacum officinale*), and English plantain (*Plantago lanceolata*).

Upland forests are dominated by Douglas-fir (*Pseudotsuga menziesii* var. *menziesii*), western hemlock (*Tsuga heterophylla*), bigleaf maple (*Acer macrophyllum*), and red alder (*Alnus rubra*). The shrub layer includes snowberry (*Symphoricarpos albus*), dull Oregon-grape (*Mahonia nervosa*), salmonberry (*Rubus spectabilis*), dewberry (*Rubus ursinus*), Himalayan blackberry (*Rubus armeniacus*), osoberry (*Oemleria cerasiformis*), red huckleberry (*Vaccinium parvifolium*), beaked hazelnut (*Corylus cornuta* ssp. *californica*), and salal (*Gaultheria shallon*). The herbaceous layer includes western sword fern (*Polystichum munitum*), Pacific bleedingheart (*Dicentra formosa* ssp. *formosa*), Oregon wood-sorrel (*Oxalis oregana*), Siberian springbeauty (*Claytonia sibirica*), stinging nettle (*Urtica dioica* ssp. *gracilis*), wild lily-of-the-valley (*Maianthemum dilatatum*), fringe cup (*Tellima grandiflora*), and stream violet (*Viola glabella*). Openings in the forest are dominated by bracken fern (*Pteridium aquilinum* ssp. *pubescens*), snowberry, and various grasses and forbs. Some large, introduced American chestnut (*Castanea dentata*) trees are present at the western edge of the fields within the Saddle Dam Farm and are associated with an old homestead.

6.2.5.1.3 Wetland Resources

AECOM conducted a delineation of wetlands and other waters of the U.S. in the Saddle Dam project area in April 2022 to support project planning, design, and permitting. AECOM prepared a Wetland Delineation and Critical Areas Report (AECOM 2022c) that was submitted to the USACE as part of the CWA Section 404 permit application. The CWA Section 404 permit

application also included a Joint Aquatic Resources Permit Application (JARPA) form and drawings. The JARPA form provides an overall description of the project and existing site conditions, a description of wetlands and other waterbodies on and adjacent to the project area, a list of ESA-listed species and other special status species that might be affected by the project, project construction activities, and anticipated impacts to wetlands and other waterbodies, including excavation and fill quantities, and impact avoidance and minimization measures. Drawings illustrating existing site conditions (including delineated wetlands and other waters), the overall project layout, the construction layout, the existing dam excavation plan, the proposed filter and drain berm plan, and proposed riprap rehabilitation plan were also provided.

The wetland delineation field investigation confirmed the presence of three wetlands, four streams, and two ponds in the project vicinity (AECOM 2022c). Non-wetland waterbodies are discussed in Section 6.2.2. The wetlands, listed in Table 6-2, are all adjacent to, or impoundments of, Frasier Creek, which is a perennial tributary of the Lewis River. They are therefore presumed to be jurisdictional wetlands regulated by Section 404 of the federal CWA. The three wetlands are all more than 1,800 feet from Yale Saddle Dam.

Table 6-2 Wetlands Delineated in the Project Vicinity

Name	Cowardin Class	Hydrogeomorphic Class	Size (acre)	Rating
Wetland A	Emergent/Scrub-shrub/Open Water	Depressional/Riverine	0.51	Category III
Wetland 2A	Emergent	Riverine/Slope	0.04	Category III
Wetland 3A	Emergent/Open Water	Depressional/Riverine	0.70	Category III

The proposed action construction limits have been designed to avoid work within 200 feet of the wetlands, streams, and ponds identified in the project area.

6.2.5.2 Environmental Effects

6.2.5.2.1 Construction-Related Effects

6.2.5.2.1.1 Wildlife

Birds

Bald Eagle

The proposed action would have no direct effects on the nearby eagle nest or roost core areas because the proposed drawdown and construction activities would not affect these areas. Construction activities and noise may temporarily affect eagle use (hunting and fishing) at the project area and in Yale Reservoir.

Common Loon

Priority areas for the common loon are breeding sites, migratory stopovers, and regular concentrations (WDFW 2021a). Loons have been documented nesting on lakes and reservoirs in other parts of the state but have not been documented nesting on Yale Reservoir (FERC 2006). During migration, they are common in the Puget Trough and eastern Washington but are uncommon to rare in the western Cascades. However, common loons have been observed on Yale

Reservoir (FERC 2006). The common loon is vulnerable to shoreline alteration and development, fluctuations in water levels during nesting (including reservoir drawdowns), and human disturbance in the vicinity of nesting areas (WDFW 2004).

The proposed modifications to the dam would not substantially alter the existing shoreline condition and would not alter aquatic habitat in the reservoir that may be used by common loons. Because common loons are not known to nest in Yale Reservoir, drawdown of the reservoir for riprap placement below the OHWL and human disturbance associated with the project are unlikely to impact breeding sites for this species. Construction activity, including construction noise and the reservoir drawdown, may disturb common loons using the reservoir as a migratory stopover site, but they are likely to avoid the project area during construction.

Bufflehead

Priority areas for buffleheads are breeding areas (WDFW 2021a). Buffleheads have been observed in Yale Reservoir and associated wetlands in winter (FERC 2006). They are common to fairly common winter residents in the western Cascades from October through May. Buffleheads breed in boreal forests, and Washington is on the southern end of their breeding range. They are not known to breed in the general project area (FERC 2006).

The project would have no impact on priority areas for buffleheads. Construction activities, including construction noise and the reservoir drawdown, may disturb buffleheads using the Frasier Creek ponds and Yale Reservoir, and they may avoid the project area during construction.

Hooded Merganser and Wood Duck

Priority areas for hooded mergansers and wood ducks are breeding areas (WDFW 2021a). Hooded mergansers and wood ducks have been observed breeding in the Frasier Creek wetland system on the west side of the Saddle Dam Farm (FERC 2006).

The project would have no direct or indirect impact on breeding areas for these species, as the construction disturbance limits would be greater than 200 feet from the wetlands, streams, and ponds on the west side of the park that could be used for breeding. Construction activity, including construction noise, may disturb hooded mergansers and wood ducks using Frasier Creek and its associated wetlands, ponds, and adjacent riparian habitat. These species may avoid the project area during the construction period due to noise disturbance.

Dusky Grouse

Priority areas for dusky grouse are breeding areas and regular concentrations (WDFW 2021a). Dusky grouse inhabit mountainous areas with open coniferous forests and are closely associated with Douglas-fir and true fir forests (WDFW 2004). Dusky grouse breed in open foothills and are closely associated with streams, springs, and meadows. Conifer thickets, their edges, and adjacent clearings are characteristic of high-quality breeding habitat. Nests are usually located near logs or under low tree branches in open timber. The dusky grouse is considered a recreationally important species that is vulnerable to habitat loss or degradation (WDFW 2021a). This species has been observed in the vicinity of the Yale Project (FERC 2006) and may use areas in and around the project area.

The project would have no direct impact on potential breeding habitat for dusky grouse, as the project would not disturb forested areas surrounding the Saddle Dam project area. However, construction activities, including construction noise, may disturb dusky grouse in the project vicinity, and they may avoid the project area during construction.

Great Blue Heron

Priority areas for great blue herons are breeding areas and nearby foraging habitat (WDFW 2021a). Great blue herons are common along Yale Reservoir and in wetlands; however, there are no known breeding sites in the project vicinity (FERC 2006).

The project would have no direct or indirect impact on foraging habitat in the Frasier Creek wetlands, as the wetlands, streams, ponds, and their buffers on the west side of the park that could be used for foraging are outside the construction disturbance limits of the project. Drawdown of the reservoir would temporarily alter foraging habitat for this species along the shallow margins of Yale Reservoir. However, the proposed modifications to the dam would not substantially alter the existing shoreline condition. Construction activities, including construction noise, may disturb great blue herons foraging along the shoreline of Yale Reservoir, and they may avoid the project area during construction.

Vaux's Swift

Priority areas for Vaux's swifts are breeding areas and communal roosts (WDFW 2021a). Vaux's swifts have been observed on lands near the Yale Project (FERC 2006); however, no communal roosts are known to occur in the project vicinity. Vaux's swifts are associated with old-growth forests and mature forests in the Cascade Range, and they require hollows in large snags or live trees with broken tops for nesting and night roosting, commonly using holes excavated by pileated woodpeckers (WDFW 2004). They are common summer residents in wooded areas in Washington. Wetland, riparian, and upland forest habitats surrounding the project area may provide nesting and roosting habitat for Vaux's swifts. Potential nesting trees are not known to occur within the construction disturbance limits of the project or tree removal areas.

Project construction is not anticipated to impact breeding areas or communal roosts for this species because these habitats do not occur near construction areas.

Mammals

Columbia Black-Tailed Deer and Roosevelt Elk

Priority areas for Columbia black-tailed deer are regular concentrations and migration corridors for the species (WDFW 2021a). Priority areas for Roosevelt elk are calving areas, migration corridors, and regular concentrations in winter and in foraging areas along coastal waters (WDFW 2021a). Both species have been documented in the project vicinity.

Saddle Dam Farm is a former homestead that is managed as part of the Lewis River WHMP (PacifiCorp 2008) as an important foraging habitat area for elk. WHMP areas within the project area include fields and meadows and two orchards that are managed specifically as a source of forage for elk, with hedgerows breaking up line-of-sight and providing browse. The fields are typically mowed during the spring and late summer months to promote high-quality forage, reduce

noxious weeds, and prevent shrub encroachment. The orchards are not typically mowed during the summer, as they are heavily used by bedding elk during the summer months when the fields are mowed (PacifiCorp 2008). Fall to early spring is a period of critical use for forage species, including deer and elk.

Elk use of the fields and meadows within Saddle Dam Farm would be affected during construction of the project, which is estimated to last 18 months, as these areas would be used for construction access and staging. The orchards are outside the limits of disturbance and would not be impacted. However, both deer and elk are likely to avoid the project vicinity during construction due to noise disturbance and vehicle activities.

Some trees that may be used for elk browse and/or cover would be removed to accommodate construction access, the extended dam embankment, and central drainage swale. The fields and meadows used for construction access and staging would be restored following completion of the project.

Amphibian

Larch Mountain Salamander

The project would have no effect on the Larch Mountain salamander because there are no known occurrences of the species on Yale Saddle Dam or within the Saddle Dam Day Use area (FERC 2006).

6.2.5.2.1.2 Botanical Resources

Approximately 15 acres of upland herbaceous habitat, consisting predominantly of non-native grasses and forbs, would be temporarily altered for use as construction access and laydown areas. These impacts would be short term, as these areas would be restored following completion of the project.

The downstream portion of the dam embankment and abutments would be cleared and grubbed of vegetation, permanently displacing approximately 6.4 acres of grass and forb habitat and scattered trees. The surface of the extended dam embankment and abutments would be maintained free of vegetation following completion of the project.

Approximately 0.59 acre of existing vegetation, including upland herbaceous habitat and tree/shrub habitat, would be removed for construction of the central drainage swale. The drainage swale would be replanted with grass.

Approximately 140 to 150 trees would be removed for the project to accommodate construction access, the extended dam embankment, and the central drainage swale (Figure 4-3). Mitigation for the impacts of tree removal is discussed in Section 6.2.5.2.3.

6.2.5.2.1.3 Wetland Resources

The project and construction layout site have been designed to avoid all impacts to wetlands, streams, and ponds on the west side of the park. Access to the project area would be via Frasier Road, and access to the laydown areas west of the dam would be via the 1000 Road from Frasier Road (Figure 4-2). The construction access roads, laydown areas, and vehicle circulation are configured so that construction disturbance limits in this area are greater than 200 feet from the

wetlands, streams, and ponds on the west side of the park. The standard buffer width for the streams and ponds on the west side of the park is 100 feet. No direct impacts to streams and ponds would occur as a result of the project. Indirect impacts would be avoided by maintaining the standard 100-foot undisturbed buffer widths. No vegetation clearing/removal or other ground disturbance would occur within stream or pond buffers.

Riprap rehabilitation on the upstream face of the dam on the right abutment would be within approximately 45 feet of the mouth of Stream 4 where it discharges into Yale Reservoir at the OHWL of the reservoir. This disturbance area encroaches approximately 5 feet into the standard 50-foot Riparian Habitat Area buffer for Stream 4. However, the stream buffer in this area is already hardened with riprap. Supplementing the existing riprap in this area would not result in further reduction of the functioning buffer or alter existing buffer function and would not result in adverse impacts to the stream.

6.2.5.2.2 Operations-Related Effects

Operation of the project would have no impact on wetlands. The downstream portion of the dam embankment and abutments would be cleared and grubbed of existing vegetation, and the surface of the modified dam embankment would consist of rock and would be maintained free of vegetation. These modifications to the dam embankment would permanently displace approximately 6.4 acres of grass and forb habitat and scattered trees. The extended dam embankment encroaches into the Saddle Dam Farm WHMP areas on the project area and would permanently displace approximately 1.2 acres of WHMP land managed for elk foraging habitat.

6.2.5.2.3 Proposed Protection Measures and Analysis

PacifiCorp proposes the measures listed below to minimize and mitigate for adverse impacts to wildlife, botanical, and wetland resources:

- Fields and meadows within Saddle Dam Farm that would be used for temporary construction access and laydown areas would be restored following completion of the project, in accordance with the Lewis River WHMP (PacifiCorp 2008), which includes requirements for planting and managing the site to provide and maintain high-quality forage habitat for elk.
- Appropriate BMPs would be installed to minimize the transport of silt and sediments outside of the limits of construction and minimize potential impacts to Stream 4. The construction contractor would be required to comply with a TESC plan that would be implemented to manage construction stormwater runoff during construction. The TESC plan would comply with conditions contained in the construction stormwater general permit that would be obtained for the project.
- To mitigate for the remediation project impacts to wildlife and WHMP lands, PacifiCorp would contribute additional funds into the Lewis River Mitigation Fund, to be used for mitigation projects, including land acquisition or special projects on WHMP lands. PacifiCorp is currently coordinating with the TCC to develop the mitigation funding amount, which will be based on the actual project impacts on wildlife habitat. The mitigation funding is anticipated to include compensation for the permanent loss of WHMP

lands; “triple stumpage payment” for the removal of trees on WHMP lands (considered to be the equivalent of a 3:1 replacement ratio); and compensation for the temporary loss of habitat use on WHMP lands during construction.

6.2.5.3 Effects of the No-Action Alternative

Under the no-action alternative, PacifiCorp would maintain a maximum operating elevation of 480 feet amsl for the Yale Reservoir indefinitely, until seismic concerns are addressed for the Yale Saddle Dam. The no-action alternative would have no impact on upland vegetation communities in the Yale Reservoir valley. However, the no-action alternative would result in a continued and long-term reduction in water level in the reservoir and wetted habitat area during the summer months, which over time would impact riparian vegetation communities along the perimeter of the reservoir and lake fringe wetlands, and could impact other associated wetlands that have a surface or groundwater connection with the reservoir. Additionally, sediments in the lakebed above 480 feet amsl would be exposed for a longer duration of time than occurs under the normal range of operating elevations and time frames, and new vegetation communities would likely establish in these areas. These impacts to wetted habitat area during the summer months and vegetation communities would result in impacts to birds and other wildlife species that utilize these habitats.

6.2.6 Threatened and Endangered Species and Essential Fish Habitat

This document examines six federally listed species with the potential to occur in the area: northern spotted owl, bull trout, coho salmon, Lower Columbia River Chinook salmon, steelhead trout, and Cascade torrent salamander. Additionally, EFH designated by the Pacific Fishery Management Council occurs in the area. No threatened or endangered vascular plant species are known to occur on or near the project area. However, a state sensitive lichen (*Usnea longissima*) occurs on a few trees at the west end of Saddle Dam Farm, outside of the construction limits of the proposed action (AECOM 2022c). The proposed action would have no impact on this lichen species.

6.2.6.1 Affected Environment

6.2.6.1.1 Northern Spotted Owl

The northern spotted owl is federally listed throughout its range as threatened under the ESA. Northern spotted owl habitat is mapped throughout the township in which Yale Saddle Dam is located (WDFW 2022a), which includes forest surrounding the project area. Preferred habitat includes mid and late seral coniferous forests. Typical habitat characteristics for the species include generally high canopy closure, complex canopy structure involving trees of multiple age or size classes, large decaying trees and/or snags, and a high volume of downed wood.

Due to historical land use in the Yale Saddle Dam area, including agriculture, forestry, and dam construction, the project area does not contain northern spotted owl suitable habitat (personal communication, K. Emmerson, PacifiCorp, March 17, 2022). No northern spotted owl nests are documented within 2 miles of the project area (PacifiCorp 2021a). Neither Saddle Dam Park Day Use area or Saddle Dam Farm is associated with a spotted owl management circle or within the 2-mile spotted owl special emphasis area buffer (PacifiCorp 2008).

6.2.6.1.2 Bull Trout

Bull trout have a documented presence in Yale Reservoir, and the reservoir was designated as critical habitat for bull trout in 2010 (75 Federal Register 9251).

6.2.6.1.3 Coho Salmon

Columbia River coho salmon are blocked by Merwin Dam and Yale Dam on the Lewis River. However, Yale Reservoir was designated as critical habitat for coho salmon in 2016 (81 Federal Register 9251).

6.2.6.1.4 Chinook Salmon

Yale Reservoir is mapped as having historical populations of naturally spawning Lower Columbia River Chinook salmon. This habitat is currently considered blocked by the major dams on the Lewis River (FERC 2006). However, Chinook salmon have been observed in Yale Reservoir having passed down from Swift Reservoir, which is now available habitat for this species.

6.2.6.1.5 Steelhead Trout

Yale Reservoir is mapped as having historical populations of naturally spawning steelhead trout. This habitat is currently considered blocked by the major dams on the Lewis River (FERC 2006). However, steelhead trout have been observed in Yale Reservoir having passed down from Swift Reservoir, which is now available habitat for this species.

6.2.6.1.6 Cascade Torrent Salamander

Cascade torrent salamanders have been documented in tributary streams/seeps to Yale Reservoir (FERC 2006) and could potentially occur in Frasier Creek, Stream 2, Stream 3, and Stream 4.

6.2.6.1.7 Essential Fish Habitat

The Pacific Fishery Management Council designated EFH for Chinook and coho salmon in 1999 (PFMC 1999). The geographic extent of freshwater EFH is identified as all waterbodies currently or historically occupied by Council-managed salmon in Washington, Oregon, Idaho, and California (PFMC 2022). NMFS previously determined that the project area includes areas designated as EFH for various life-history stages of Chinook salmon and coho salmon (NMFS 2007), and EFH for these species is mapped in the area by NMFS resources (NMFS 2022).

6.2.6.2 Environmental Effects

6.2.6.2.1 Construction-Related Effects

6.2.6.2.1.1 Northern Spotted Owl

The Lewis River WHMP (PacifiCorp 2008) contains the following conservation measures specified in the USFWS Biological Opinion for the Lewis River Hydroelectric Projects (USFWS 2006) that are potentially relevant to construction near northern spotted owl habitat:

- If construction occurs within 0.25 mile (0.4 kilometer) of unsurveyed suitable habitat, either:
 - The habitat would be surveyed to protocol prior to construction to confirm the presence or absence of northern spotted owl nesting, or
 - High-impact sound-generating activities associated with construction (such as pile driving, rock drills, or impact hammers) would be scheduled to occur outside the early nesting season of March 1 to June 30 to avoid potentially disturbing nesting northern spotted owls.

Construction would occur within 0.25 mile of northern spotted owl suitable habitat, which surrounds the project area. However, project construction is not anticipated to require the use of high-impact, sound-generating equipment. No pile driving or use of impact hammers or rock drills is anticipated to be necessary to construct the project. PacifiCorp would require the construction contractor to confirm that no high-impact sound-generating equipment would be used during construction. If the use of such equipment is proposed, PacifiCorp would implement the conservation measures listed above to avoid potential impacts to nesting northern spotted owl.

6.2.6.2.1.2 Bull Trout, Coho Salmon, Chinook Salmon, Steelhead Trout, and EFH

The reservoir would be drawn down to an elevation of 465 feet to facilitate the placement of riprap on the upstream face of the dam along the shoreline. PacifiCorp anticipates conducting the drawdown during a 2-week period in December and/or January. A drawdown may be conducted in 2 consecutive years if needed by the construction contractor to complete the project. The proposed reservoir drawdown is not expected to result in a loss of unique habitat for fish or result in fish stranding. There would be a temporary loss of linear feet of habitat from the minimized circumference of the reservoir. However, it is assumed conducting the drawdown during the winter months would minimize impacts to fish due to the loss of littoral habitat, as most fish species that over-winter in the reservoir move into the deeper pelagic zones during this time.

Construction activities on the shoreline and below the OHWL in the reservoir may result in elevated sediment levels in the reservoir and could result in short-term impacts to listed fish species, managed fish species, and EFH.

PacifiCorp is consulting with the USFWS and NMFS under Section 7 of the ESA regarding the effects of the project on critical habitats and would implement additional BMPs and conservation measures identified by the Services to minimize impacts to listed fish species and designated critical habitat in Yale Reservoir. Additionally, Section 4.5.2(b) of PacifiCorp's Section 401 Water Quality Certification/Order No. 3677 issued by Ecology for the Yale Project (FERC No. 2071) requires preparation of an IWWPP to protect water resources during in-water work activities

(Ecology 2006). The construction contractor would be required to comply with the approved IWWPP.

6.2.6.2.1.3 Cascade Torrent Salamander

The project avoids direct and indirect impacts to streams in the project area that provide potential habitat for Cascade torrent salamander. Therefore, construction of the proposed action would have no effect on this species.

6.2.6.2.2 Operations-Related Effects

As discussed in Section 6.2.4.2.2, reverting to a normal operating elevation of 490 feet amsl would increase the linear feet of shoreline and available fish habitat during the summer months, compared to current operations. However, water levels during the spring and winter would remain the same and would not affect available fish habitat. Operation of the proposed project would have no adverse effects on federally listed species or their critical habitat, and would return to previous conditions of the designated EFH because the project would return the reservoir elevation to historical levels.

6.2.6.2.3 Proposed Protection Measures and Analysis

PacifiCorp proposes the following measures to minimize potential impacts to northern spotted owl:

- PacifiCorp would require the construction contractor to confirm that no high-impact sound-generating equipment would be used during construction. If the use of such equipment is proposed, PacifiCorp would utilize the conservation measures described above to avoid potential impacts to nesting northern spotted owl.

PacifiCorp proposes the following measures to minimize impacts to bull trout, coho, Chinook salmon, steelhead trout, and designated critical habitat and EFH in Yale Reservoir:

- To minimize potential impacts to fish and fish habitat during drawdown of the reservoir for riprap placement, the reservoir drawdown would be conducted during a 2-week period in the winter (December and/or January) when it is assumed most fish that overwinter in the reservoir move to deeper zones.
- To mitigate for potential fish stranding during drawdown of the reservoir, PacifiCorp would deploy crews at strategic locations around the reservoir once the drawdown elevation is reached, to conduct fish salvage as needed.
- To minimize the potential for elevated sediment levels in the reservoir from construction activity along the shoreline and below the OHWL, suitable BMPs would be installed to minimize the transport of silt and sediments outside of the limits of construction.
- Long-term project related effects to bull trout Designated Critical Habitat is expected to be null and come in the form of adding riprap to existing riprap on the face of Saddle Dam.
- The construction contractor would be required to comply with a TESC plan that would be implemented to manage construction stormwater runoff. The TESC plan would comply with conditions contained in the construction stormwater general permit that would be obtained for the project.

- PacifiCorp is consulting with the USFWS and NMFS regarding ESA compliance for the project and would implement additional BMPs and conservation measures identified to further minimize impacts to bull trout, coho, Chinook salmon, steelhead trout, and designated critical habitat in Yale Reservoir.
- PacifiCorp would prepare an IWWPP to protect water resources during in-water work activities to comply with the existing Section 401 Water Quality Certification for the Yale Project. The construction contractor would be required to comply with the approved IWWPP.

6.2.6.3 Effects of the No-Action Alternative

Under the no-action alternative, PacifiCorp would maintain a maximum operating elevation of 480 feet amsl for Yale Reservoir indefinitely, or until seismic concerns are addressed for the Yale Saddle Dam. The no-action alternative would have no impact on spotted owl or Cascade torrent salamanders. Impacts of the no action alternative on bull trout, Chinook salmon, and steelhead trout would be similar to impacts on fish described in Section 6.2.4, *Fisheries and Aquatic Resources*.

6.2.7 Cultural and Historic Resources

6.2.7.1 Affected Environment

Construction of Yale Saddle Dam began post-World War II as energy demands increased in response to national defense and economic growth in agriculture and industry in the Pacific Northwest. In 1951, Pacific Power and Light was granted a full license by the Federal Power Commission for construction and by 1953, the dam was complete. During construction, the complex included temporary offices, mess halls, and barracks to facilitate the maximum 1,700-person work force that operated 24 hours per day. By 1956, much of this temporary construction had been dismantled or inundated by the reservoir. By that time, the property was owned by Pacific Power and Light; the property is currently owned by PacifiCorp (Derr, Bialas, and Henderson 2021).

In June 2008, FERC granted PacifiCorp new licenses to operate the three facilities (the Lewis River Hydroelectric Projects): the Swift No. 1 Project (FERC No. 2111), the Yale Project (FERC No. 2071), and the Merwin Hydroelectric Project (FERC No. 935). Review of that relicensing process under Section 106 of the NHPA resulted in a Programmatic Agreement (PA) that stipulated implementation of a Historic Properties Management Plan (HPMP) upon issuance of the new FERC licenses. Satisfactory implementation of the PA's cultural resources stipulations by PacifiCorp as represented in the resulting HPMP constitutes FERC's compliance with Section 106 requirements. The HPMP also provides for compliance with other applicable federal and state regulations during operation and maintenance of the Lewis River Hydroelectric Projects.

No properties that were previously determined eligible for inclusion, or are currently listed, in the National Register or Washington Heritage Register are located in the project area or within a 0.25-mile radius of the project. The Yale Dam, 0.25 mile southeast of the project area, was documented in 1997 and is currently unevaluated the National Register (Brewster 1997). No previously

recorded historic landmarks, cemeteries, or traditional cultural properties are in the project area or adjacent properties.

Three archaeological sites and one archaeological isolate are within the project area (Bialas and Ragsdale 2016; Derr, Bialas, and Henderson 2021). Two sites are historic, one site contains both precontact and historic components, and the isolate is precontact. One site is not eligible for the National Register, two sites are unevaluated and treated as eligible for the National Register, and the isolate is considered not eligible for the National Register.

6.2.7.2 Environmental Effects

6.2.7.2.1 Construction-Related Effects

No properties eligible or listed on the National Register or Washington Heritage Register were identified in the project area. However, two as-yet unevaluated archaeological sites have been identified in the project area. Construction activities associated with the proposed action could potentially impact these unevaluated sites and unearth previously unidentified cultural resources. However, with implementation of proposed protection measures (Section 6.2.7.2.3), including an Inadvertent Discovery Plan, it is unlikely that adverse effects to cultural resources would occur.

6.2.7.2.2 Operations-Related Effects

Operating the project after completion of the proposed seismic upgrades would not affect any known historic properties or cultural resources.

6.2.7.2.3 Proposed Protection Measures and Analysis

PacifiCorp has modified the project area of impact to avoid two of the archaeological sites and established a 25-foot no-work buffer around the features at the third archaeological site. These sites would not be impacted by the project. An Inadvertent Discovery Plan has been prepared that addresses procedures to be followed in the event a discovery is made during project construction (PacifiCorp 2017). Should archaeological materials (e.g., bones, shell, stone tools, beads, ceramics, old bottles, hearths, etc.) or human remains be observed during project activities, all work in the immediate vicinity should stop. The DAHP, Cowlitz County Historic Preservation Commission, affected Tribe(s), and Cowlitz County medical examiner (human remains only) would be contacted immediately in order to help assess the situation and determine how to preserve the resource(s). Compliance with all applicable laws pertaining to archaeological resources (Revised Code of Washington [RCW] 27.53, RCW 27.44, and WAC 25-48) is required.

6.2.7.3 Effects of the No-Action Alternative

Under the no-action alternative, PacifiCorp would maintain a maximum operating elevation of 480 feet amsl for Yale Reservoir indefinitely, or until seismic concerns are addressed for the Yale Saddle Dam. The no-action alternative could affect cultural resource sites that occur between 480 and 490 amsl. These sites would be exposed to weathering from rain, wind, and freeze/thaw events. These sites would also be exposed to increased pedestrian access and potential impacts from physical disturbance and/or looting.

6.2.8 Recreation

6.2.8.1 Affected Environment

6.2.8.1.1 Regional Recreation Facilities

PacifiCorp provides several areas for public recreation along three reservoirs: Swift Reservoir, Yale Reservoir, and Lake Merwin (PacifiCorp 2022). These sites offer a suite of outdoor recreation opportunities including camping, picnicking, wildlife viewing, hiking, swimming, fishing, and others. In addition, several of the sites include boat ramps to launch motorized watercraft. Table 6-3 summarizes the recreation opportunities provided at these sites.

Table 6-3 Summary of PacifiCorp Recreation Facilities and Opportunities

Recreation Area	Facilities and Opportunities
SWIFT RESERVOIR	
Swift Forest Camp	93 campsites, day-use picnic area, boat ramp, swimming beach, play structure, amphitheater, access to 11 Swift Reservoir dispersed shoreline campsites
Eagle Cliff Park	10 picnic tables
YALE RESERVOIR	
Beaver Bay Campground	63 campsites, one 15-site group camp, day-use picnic area, swimming beach, hiking trail access, boat ramp
Cougar Campground	45 campsites, one 15-site group camp, day-use picnic area, swimming beach, hiking trail access, boat ramp
Yale Park	42 picnic tables, covered picnic shelters, boat ramp, swimming beach
Saddle Dam Park	Picnic area, covered picnic shelter, swimming beach, boat ramp, equestrian and hiker trails, access to 9 Yale Reservoir dispersed shoreline campsites
LAKE MERWIN	
Cresap Bay Park	56 campsites, swimming beach, boat ramp, 23-slip marina, day-use picnic area, hiking trail, amphitheater
Speelyai Bay Park	25 picnic tables, covered picnic shelter, swimming beach, boat ramp
Merwin Park	135 picnic tables, two covered picnic shelters, swimming beach, playground structure, bank fishing, hiking trail

Source: PacifiCorp 2022

Table 6-4 summarizes peak month (July and August) and summer season (Memorial Day through Labor Day) day-use visitation data collected during a 12-year recreation use monitoring study concluded in 2021 based on field observations and concessionaire data (PacifiCorp 2021b). Approximately 112,693 people visited a PacifiCorp day-use area in the 2021 summer season, with Yale Park, Speelyai Bay, and Merwin Park having the highest levels of use.

Table 6-4 Peak Month and Summer Season Use at Day-Use Sites¹

Recreation Area	Peak Month (July and August)	Summer Season (Memorial Day through Labor Day)
SWIFT RESERVOIR		
Swift Forest Camp	2,433	3,743
Eagle Cliff Park	849	1,393
YALE RESERVOIR		
Beaver Bay Park	1,281	1,971
Cougar Park	3,394	5,222
Yale Park	17,224	26,499
Saddle Dam Park	7,662	11,787
LAKE MERWIN		
Cresap Bay Park	8,231	12,663
Speelyai Bay Park	14,082	21,665
Merwin Park	18,038	27,750
Overall Total	73,194	112,693

¹ Day-use sites can include overnight camping.

Source: PacifiCorp 2021b

6.2.8.1.2 Saddle Dam Park Day Use and Saddle Dam Farm

The proposed project is located within the Saddle Dam Park Day Use area and adjacent to the Saddle Dam Farm on Yale Reservoir. The Saddle Dam Park Day Use is open annually from Memorial Day weekend through Labor Day and supports a variety of recreation activities, including swimming, boating, shoreline picnicking, horseback riding, and hiking. The park contains day-use facilities, including a boat launch, a swim beach, an ADA-accessible picnic area with a pavilion, mooring anchorage for boat-in access, and non-motorized trails. The Saddle Dam Farm is open year-round for public non-motorized use, including hiking, equestrian riding, hunting and wildlife viewing. A separate parking area is available for farm area access.

The Park Day Use facility is popular with jet ski and personal watercraft users and power boaters, as well as equestrians that ride to the Speelyai Canal area. The Saddle Dam Park trail is located in forested areas north and west of the project area and in Saddle Dam Farm adjacent to the dam.

A parking lot for the park is located approximately 150 feet from the dam and extends for about a third of the dam's length. This parking lot is the only location that allows overnight parking for dispersed shoreline camping along Yale Reservoir.

As shown in Table 6-4, approximately 11,787 people visited Saddle Dam Park Day Use over the summer season (Memorial Day through Labor Day) in 2021 (PacifiCorp 2021b).

6.2.8.1.3 Yale Park

The proposed project will require a two-week Yale reservoir drawdown during the winter of 2024/2025 to elevation 465 feet. At this elevation the Yale boat ramp is not available to launch/retrieve trailered boats. The minimum elevation for ramp operation is 468 feet. A short-term impact will occur to the kokanee recreational fishery which takes place during the winter season. Merwin reservoir will remain accessible for trailered boats during the same period.

6.2.8.2 Environmental Effects

6.2.8.2.1 Construction-Related Effects

The Saddle Dam Park Day Use and portions of the Saddle Dam Farm would be closed and unavailable to recreational uses for the duration of the construction period, which is currently estimated at 18 months. The closure would begin between in the fall of 2024 and conclude in early 2026 depending on timing of FERC and other regulatory approvals. Park closure is estimated to extend through the entire 2025 recreation season, possibly extending into the early part of the 2026 season. The day use park entrance, access road, parking lot, and boat launch would be used for construction access to the park, parking, staging, and access to the dam face and would be unavailable to the public. Nearby farm fields (approximately up to 12 acres) would be used for staging of equipment and areas of Saddle Dam Farm closed to public access for the duration noted above. Impact to hunting and wildlife viewing may extend beyond the closure period as disturbed areas recover.

Some modifications to the Saddle Dam Park Day Use recreation facilities would be necessary as a result of extending the dam embankment downstream. The modifications are likely to include restoring the downstream parking lot, relocating the existing septic system at the parking lot cleanout station, relocating the three park host sites, and relocating electric and water utilities, and fencing. Although the parking lot would be impacted by the proposed action, there would be no net reduction in parking.

On the downstream side of the dam, the gravel parking lot would be reconfigured to accommodate the expanded width of the filter and drain berm. The reconfigured parking lot would be approximately the same size as the existing lot and would include new grass vegetated islands and a new drainage swale. The park host sites at the south end of the parking lot would be relocated beyond the expanded dam embankment, and one light pole in the parking lot would be relocated. Farm areas disturbed will be revegetated.

The existing asphalt ADA-accessible ramp and fence and the concrete stairs and rails extending from the parking lot on the downstream side of the dam would be demolished and replaced in-kind on the extended dam embankment. Recreational facilities on the upstream side of the dam would remain in their existing locations. The equestrian trail where it crosses the right abutment of the dam would be restored following project completion.

Temporary adverse effects would occur by potentially displacing about 11,800 visitors annually over the construction period through closing of Saddle Dam Park Day Use (PacifiCorp 2021b). The displaced visitors could drive to visit one or more of the locations identified in Table 6-3 that offer similar recreational opportunities and facilities. The closest alternative recreation site, Cresap Bay Park on Lake Merwin, is approximately 2.3 miles away.

To mitigate the loss of Saddle Dam Park Day Use parking and boat accessibility, PacifiCorp reviewed its other Lewis River recreation facilities to locate a suitable supplemental parking and boat ramp access opportunities. PacifiCorp has identified two parks, Cresap Bay Park and Yale Park, that can be expanded to mitigate the short-term loss of parking and reservoir access at Saddle Dam Park Day Use (PacifiCorp 2021c). These proposed improvements were submitted via non-capacity license amendment applications to FERC on November 9, 2021 (PacifiCorp 2021c). On December 19, 2022, the FERC issued an Order approving the Cresap Bay Park and Yale Park expansions (FERC, 2022).

6.2.8.2.2 Operations-Related Effects

The proposed action to perform a seismic rehabilitation of Yale Saddle Dam would not result in operational changes to the dam or the larger Lewis River Hydroelectric Project, with the exception of allowing the reservoir to return to a normal maximum operating level of 490 feet amsl. Saddle Dam Park Day Use would be re-opened once construction is complete. As discussed in Section 4.1.2.3, any recreational facilities affected during construction would be replaced in-kind, and the equestrian trail would be rehabilitated. No adverse effects would occur from operation of the proposed action.

Beneficial effects would occur to recreational resources by allowing the re-opening of several swim areas that are currently unusable because of the dam's lower water elevation.

6.2.8.2.3 Proposed Protection Measures and Analysis

As discussed in Section 6.2.8.2.1, PacifiCorp proposes and has acquired FERC approval to expand parking and reservoir access at Cresap Bay Park and Yale Park to mitigate the short-term loss of recreation access at Saddle Dam Park Day Use (PacifiCorp 2021c and FERC, 2022). No additional protection measures are proposed.

6.2.8.3 Effects of the No-Action Alternative

Under the no-action alternative, there would be no construction activities that result in short-term closure of Saddle Dam Park Day Use. PacifiCorp would maintain a maximum operating elevation of 480 feet amsl for Yale Reservoir indefinitely, or until seismic concerns are addressed for the Yale Saddle Dam.

Beneficial effects to recreation, including re-opening of several swim areas that are currently unusable because of the dam's lower water elevation, would not occur under the no-action alternative. Displaced visitors could instead visit one or more of the locations identified in Table 6-3 that offer similar recreational opportunities and facilities. The closest alternative recreation site, Cresap Bay Park on Lake Merwin, is approximately 2.3 miles away.

6.2.9 Environmental Justice

6.2.9.1 Affected Environment

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 Federal Register 7629), requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority communities and low-income populations. Under Executive Order 12898, demographic information is used to determine whether minority populations or low-income populations are present in the areas potentially affected by the project. If so, a determination must be made as to whether implementation of the project may cause disproportionately high and adverse human health or environmental effects on those populations.

The following analysis of environmental justice includes a discussion of the minority and economic status of affected groups and determines if the proposed action would result in disproportionate environmental effects to minority and low-income populations. Preparation of this environmental justice analysis is in accordance with the Council on Environmental Quality's (CEQ's) *Guidance for Agencies on Key Terms in Executive 14 Order 12898* (CEQ 1997) and *Promising Practices for EJ Methodologies in NEPA Reviews* (Federal Interagency Working Group on Environmental Justice 2016).

6.2.9.1.1 Meaningful Engagement and Public Involvement

CEQ (1997) and Federal Interagency Working Group (2016) guidance recommend that federal agencies provide opportunities for effective community participation, including identifying potential effects and mitigation measures in consultation with affected communities and improving the accessibility of public meetings, crucial documents, and notices.

As discussed in Section 5.1, there would be opportunities for public involvement during FERC's environmental review process and through review required by Settlement Parties under the Lewis River Settlement Agreement.

6.2.9.1.2 Definition of Minority and Low-Income Environmental Justice Populations

6.2.9.1.2.1 Minority Environmental Justice Populations

The federal definition of a minority environmental justice community requires that the minority population (or total of all minority groups) of that community either: (1) exceeds 50 percent of the total population of the community; or (2) is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis (CEQ 1997; Federal Interagency Working Group on Environmental Justice 2016). A minority population also exists if there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above stated thresholds (CEQ 1997).¹

¹ The CEQ defines minority individuals as persons from any of the following U.S. Census categories for race: Black/African American, Asian, Native Hawaiian or Other Pacific Islander, and American Indian or Alaska Native. Additionally, for the purposes of this analysis, minority individuals also include all other nonwhite categories, such as "some other race" and "two or more races." The CEQ also mandates that persons identified through the U.S. Census as ethnically Hispanic, regardless of race, should be included in minority counts (CEQ 1997).

Minority status is composed of both race and ethnicity. Minority ethnicity includes Hispanic origin (CEQ 1997). Race and ethnicity are not mutually exclusive; therefore, individuals who identify as Hispanic origin can be of any race. As a result, the white only (non-Hispanic) population represents the only non-minority population.

6.2.9.1.2.2 Low-Income Environmental Justice Populations

Executive Order 12898 itself does not define the term “low-income” as it relates to environmental justice communities. The U.S. Environmental Protection Agency guidance criteria suggests identification and analysis of low-income populations can be accomplished by (1) selecting and disclosing the appropriate poverty thresholds as defined by the U.S. Census Bureau, the poverty guidelines as defined by the Department of Health and Human Services, or other appropriate sources; and (2) identifying an appropriate geographic unit of analysis for identifying low-income populations in the affected environment (Federal Interagency Working Group on Environmental Justice 2016).² As a frame of reference, the federal poverty level in 2022 was \$27,750 for a family of four (HHS 2022).

6.2.9.1.3 Methodology for Identifying Environmental Justice Communities in the Study Area

The U.S. Census Bureau’s 2016-2020 American Community Survey was used to identify if environmental justice communities occur in the study area.³ Following the recommendations set forth in *Promising Practices*, FERC uses the 50 percent and the meaningfully greater analysis methods to identify minority populations. Using this methodology, minority populations are defined in this analysis where either: (1) the aggregate minority population of the block groups in the affected area exceeds 50 percent; or (2) the aggregate minority population in the block group affected is 10 percent higher than the aggregate minority population percentage in the county. The guidance also directs low-income populations to be identified based on the annual statistical poverty thresholds from the U.S. Census Bureau. Using *Promising Practices*’ low-income threshold criteria method, low-income populations are identified as a block group where the percent of low-income population in the identified block group is equal to or greater than that of the county.

² Statistical poverty thresholds established by the U.S. Census Bureau state a low-income population is present if the population either: (1) exceeds 50 percent of the total population of the community; or (2) is meaningfully greater than the general population (CEQ 1997; Federal Interagency Working Group on Environmental Justice 2016).

³ Estimates from the American Community Survey are all “period” estimates that represent data collected over a period of time (as opposed to “point-in-time” estimates, such as the decennial census, that approximate the characteristics of an area on a specific date). The primary advantage of using multiyear estimates in this analysis of minority and low-income populations is the increased statistical reliability of the data for less populated areas and small population subgroups.

For purposes of this analysis, the study area is defined as census tract 15.01 block group 1.⁴ Furthermore, to account for local and county-wide effects and to provide a basis for comparison of the study area, environmental justice demographic data are also provided for census tract 15.01 as a whole and Cowlitz County.

6.2.9.1.4 Environmental Justice Communities in the Study Area

Census tract 15.01 block group 1 is a geographically large area, consisting of 104 square miles, with a population of 974 residents and 521 households (U.S. Census Bureau 2020a). Most of the population is concentrated in the rural communities of Yale and Cougar.

Table 6-5 shows the race, ethnicity, and poverty percentages for the environmental justice analysis area. No minority populations in census tract 15.01 block group 1 are greater than 50 percent of the population or greater than 10 percent of the aggregate minority population in Cowlitz County. However, census tract 15.01 block group 1 meets the definition of an environmental justice low-income population, because the percentage of its residents with annual incomes below the federal poverty level (14.1 percent) exceeds the countywide average (13.3 percent).

Table 6-5 Race, Ethnicity, and Poverty by County, Census Tract, and Census Tract Block Group

Location	Total Population ¹	White ²	Black or African American	Alaska Native & American Indians	Asian	Some Other Race ³	Hispanic or Latino ⁴	Total Minority ⁵	Below Federal Poverty Level
Cowlitz County	108,399	90.7	0.9	1.2	1.2	5.9	9.3	9.3	13.3
Census Tract 15.01	3,038	93.7	0	1.6	0.4	4.3	2.5	6.3	27.7
Block Group 1	974	88.6	0	4.0	0	7.4	0	11.4	14.1

Source: U.S. Census Bureau 2020a, 2020b

Notes:

¹Total population = non-Hispanic/Latino population + Hispanic/Latino populations.

²Non-Hispanic White population only, as a basis of comparison for minority groups.

³All Other Minorities includes Native Hawaiian and Other Pacific Islander, some other race, and two or more races.

⁴Of any race.

⁵Total minority equals total population minus the Non-Hispanic White population.

Bold indicates an environmental justice community.

6.2.9.2 Environmental Effects

6.2.9.2.1 Construction-Related Effects

Based on CEQ guidance, a disproportionately high and adverse effect on an environmental justice community would occur if the adverse effect is predominately borne by such population or is

⁴ By evaluating the census tract block group, the environmental justice analysis focuses on the smallest geographic area where U.S. Census data are available and has been applied to assess the effects specific to the populations in the vicinity of the proposed action.

appreciably more severe or greater in magnitude on the minority or low-income population than the adverse effect suffered by the non-minority or non-low-income population.

As discussed above, there are no minority populations in census tract 15.01 block group 1 that are greater than 50 percent of the population or greater than 10 percent of the aggregate minority population percentage in the county. However, census tract 15.01 block group 1 has a higher percentage of low-income individuals than Cowlitz County and consequently is recognized as a low-income environmental justice community of concern.

All persons, regardless of race or income, would experience impacts associated with construction of the proposed action, and construction impacts, as described throughout this document, would be short term and temporary. It should be noted that the magnitude and intensity of construction activities would be greater for individuals and residences closest to the proposed action and would diminish with distance. According to the U.S. Environmental Protection Agency's EJScreen, there are five residents and five households within a 0.5-mile radius of proposed construction activities (EPA 2022). This radius is considered the area likely to experience most construction-related impacts.

Impacts on the natural and human environment from construction of the proposed action are identified and discussed throughout this document. As discussed in Section 6.2.8, Saddle Dam Park Day Use would be closed and unavailable to recreational uses for the duration of the construction period. Potentially adverse environmental effects on surrounding communities associated with the proposed action, including environmental justice communities, would be minimized and mitigated. Thus, there would be no high adverse or disproportionate impact on environmental justice populations from construction of the proposed action.

6.2.9.2.2 Operations-Related Effects

The proposed action to perform a seismic rehabilitation of Yale Saddle Dam would not result in operational changes to the dam or the larger Lewis River Hydroelectric Project. The long-term effects of the proposed action would be beneficial because the project would reduce the risk of catastrophic failure of the dam during a seismic event. Thus, there would be no high adverse or disproportionate impact on environmental justice populations from operation of the proposed action.

6.2.9.2.3 Proposed Protection Measures and Analysis

Because the proposed action would have no disproportionate or high adverse effects with respect to environmental justice communities, no protection measures are required or needed.

6.2.9.3 Effects of the No-Action Alternative

The no-action alternative assumes that FERC would require PacifiCorp to operate Yale Reservoir at a maximum operating elevation of 480 feet amsl. Thus, there would be no adverse or disproportionate impact on environmental justice populations from the no-action alternative.

6.3 Cumulative Impacts

Cumulative effects are defined as the effects on the environment that result from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions (40 CFR § 1508.7). Cumulative effects can result from individually minor, but collectively significant, actions taking place over a period of time, including any unknown and yet to be considered hydropower and other water and land development activities.

Table 6-6 provides a list of other identified projects that could potentially occur in the area in about the same time frame as the proposed action, and their potential environmental effects.

Table 6-6 Environmental Effects of Other Identified Projects

Project Name	Description	Potential Cumulative Impacts
Cougar Campground Improvements	Relocation of four ADA campsites to meet current standards; relocation of seven standard campsites away from erosion-sensitive shoreline; new campsite signage, ADA trail connections, ADA upgrades at two existing comfort stations, and new ADA parking. Design completed and permits pending approval. Construction start anticipated: Spring 2023.	<ul style="list-style-type: none"> • Loss of vegetation, effects on water quality in Yale Reservoir from construction area stormwater runoff, accidental discharges, and/or erosion. • Temporary loss of access to recreational resources during construction. • Beneficial effects on recreational resources within the Yale Project boundary.
Beaver Bay Campground Improvements	New vehicular site circulation, new water distribution system, removal and relocation of group camp sites adjacent to wetlands, new walk-in sites, reconfigured RV sites, ADA retrofits throughout, three new pavilions, three new/replaced comfort stations, ADA upgrades to one existing comfort station, four new/replaced septic systems, new day-use waterless restroom, new ADA boat loading facility, and new campsite signage. Design 90% complete. Permit not yet submitted. Construction start anticipated: Summer 2023	<ul style="list-style-type: none"> • Loss of vegetation, effects on water quality in Yale Reservoir from construction area stormwater runoff, accidental discharges, and/or erosion. • Beneficial effects on wetlands/buffers from relocation of campsites, internal campground roads away from wetlands. • Temporary loss of access to recreational resources during construction. • Beneficial effects on recreational resources within the Yale Project boundary.

Potential cumulative impacts of the proposed action in addition to the potential impacts of other identified projects are summarized below.

6.3.1 Geology and Soil Resources

The proposed action is not anticipated to result in cumulative impacts on geology or soil resources within the Yale Project boundary when added to the potential impacts of other identified projects in Table 6-6.

6.3.2 Water Quantity

The proposed action is not anticipated to result in cumulative impacts on water quantity within Yale Reservoir when added to the potential impacts of other identified projects in Table 6-6.

6.3.3 *Water Quality*

Construction of the proposed action and the other identified projects in Table 6-6 could result in the stockpiling of soils and earth-moving activities that increase soil erosion in the vicinity of Yale Reservoir. Additionally, water quality could be adversely affected by potential increases in stormwater runoff and the inadvertent release of chemicals, including fuels, oils, and solvents, that could enter drainages through surface runoff or subsurface absorption through soils. Each of these projects has the potential to temporarily affect water quality in Yale Reservoir. However, because of federal, state, and local regulatory requirements for water quality protection measures for each of the individual projects, cumulative impacts on water quality are unlikely to occur.

6.3.4 *Fisheries and Other Aquatic Resources*

The proposed action is not anticipated to result in cumulative impacts on fisheries and other aquatic resources within the Yale Project boundary when added to the potential impacts of other identified projects in Table 6-6.

6.3.5 *Wildlife, Botanical, and Wetland Resources*

The proposed action would result in the permanent removal of approximately 6.4 acres of existing grass and forb habitat managed specifically for elk forage, and approximately 140 to 150 trees in the general project area, affecting terrestrial habitat for a variety of wildlife species that currently utilize the project area. Each of the identified projects in Table 6-6 would also result in the removal of existing vegetation in the Yale Reservoir valley. While the exact type and quantity of vegetation removal for the other identified projects is unknown at this time, the proposed action could contribute to a cumulative impact on vegetation and terrestrial wildlife habitat in the Yale Reservoir valley. However, this impact is expected to be minor, as the proposed action includes mitigation for the unavoidable impacts of vegetation removal that is expected to compensate for these impacts over time. Additionally, because vegetation removal at the other identified projects is not anticipated to include fields and meadows specifically managed for elk, the proposed action is not anticipated to contribute to a cumulative impact on WHMP lands managed for elk. The proposed action would not result in cumulative effects to wetlands, streams, or ponds in the Yale Reservoir valley or their associated buffers.

Construction activities for the proposed action, when considered in addition to those associated with the other identified projects, could result in cumulative impacts on terrestrial wildlife in the Yale Reservoir valley from vegetation removal, earth-moving activities, construction noise, and general construction disturbance, as wildlife may avoid these areas. However, these impacts are expected to be minor, as similar habitats are widely available nearby.

6.3.6 *Threatened and Endangered Species*

The proposed action is not anticipated to result in cumulative impacts on threatened and endangered species when added to the potential impacts of other identified projects in Table 6-6.

6.3.7 Cultural and Historic Resources

The proposed action is not anticipated to result in an adverse impact to cultural resources and would therefore not contribute to cumulative effects on cultural and historic resources when added to the potential effects of other identified projects in Table 6-6.

6.3.8 Recreation

The proposed action would result in temporary impacts to recreation resources and short-term impacts to recreational opportunities at Saddle Dam Park Day Use during construction. Construction of the proposed action is estimated to take up to 18 months, resulting in the loss of recreational opportunities at Saddle Dam Park Day Use for 2 seasons between Summer 2024 and the early part of 2026. The Cougar Campground and Beaver Bay Campground Improvements would result in similar temporary and short-term impacts. Construction of these projects is anticipated to begin at about the same time as the proposed action, although the duration of construction is unknown at this time. Therefore, the proposed action, when considered in addition to these other projects, could contribute to an adverse cumulative impact to recreational opportunities on Yale Reservoir. However, these impacts would be short term, and PacifiCorp has identified proposed mitigation to compensate for recreation impacts of the proposed action.

The proposed action would allow the reservoir to return to a normal maximum operating level of 490 feet amsl. This would allow the re-opening of several swim areas in the reservoir that are currently unusable because of the dam's lower water elevation and would have a long-term beneficial impact on recreational opportunities on Yale Reservoir. When considered in addition to the other identified projects, which include improvements to recreational resources on Yale Reservoir, the proposed action would have a long-term beneficial impact on recreation.

6.3.9 Environmental Justice

The proposed action is not anticipated to result in a high adverse or disproportionate impact on environmental justice populations and would therefore not contribute to cumulative effects on these populations when added to the potential effects of other identified projects in Table 6-6.

6.4 Consistency With Comprehensive Plans

6.4.1 Cowlitz County Comprehensive Plan

The Cowlitz County Comprehensive Plan (Cowlitz County 2017) provides a framework for decision-making for future growth and development in the county. The Comprehensive Plan provides guidance that informs development of regulations and future planning efforts. Table 6-7 lists the elements of the plan and briefly describes how the proposed action is consistent with element goals.

Table 6-7 Project Consistency with Cowlitz County Comprehensive Plan

Plan Element	Project Consistency
Natural Environment and Resources	The project complies with all county development regulations that protect critical areas, land, air, water, and other natural resources.
Land Use	The project area is zoned as Smallholding. The project complies with this zoning, as it is an upgrade of an existing development and does not increase development density.
Parks, Trails, and Recreation	Following the 18-month construction period, the project would continue to provide long-term access to recreation facilities that are equivalent to those offered at present.
Transportation and Circulation	Apart from short-term transportation impacts during construction, the project would not affect transportation and circulation in the project vicinity.
Public Services, Facilities, and Utilities	The purpose of the project is to improve the seismic performance of the dam, which would protect the public services and utilities provided by the Yale Hydroelectric Project. The seismic remediation project provides utility infrastructure improvements that support electricity generation and flood control.

6.4.2 Lewis River Hydroelectric Project Management Plans

The Lewis River WHMP (PacifiCorp 2008) was developed to offset habitat impacts and wildlife losses resulting from continued operation of the Lewis River Hydroelectric Projects. The plan identifies provisions to protect, mitigate, and enhance wildlife on PacifiCorp-owned and/or -controlled lands associated with the Lewis River Hydroelectric Projects. The project vicinity includes the Saddle Dam Farm, which has been managed to maintain a cover forage ratio beneficial to elk. This meets the requirement to manage PacifiCorp lands to benefit wildlife. Other pertinent measures include buffering sensitive aquatic and terrestrial habitat from ground-disturbing activities, implementing access control as needed to protect sensitive habitat, and managing roads to maintain aquatic connectivity and control runoff and erosion. The project would meet the requirements of the WHMP by avoiding wetlands and riparian areas, drawing down the reservoir to avoid in-water work below the OHWL, implementing BMPs to keep sediment from entering the reservoir, and restoring elk habitat disturbed during construction.

The Recreation Resource Management Plan (RRMP) for the Lewis River Hydroelectric Projects (PacifiCorp 2020b) guides recreation resource management on project lands during the FERC license period. The RRMP identifies measures for existing and proposed recreation resources and describes programs designed to implement those measures. Although the proposed action would result in closure of Saddle Dam Park Day Use for approximately 18 months and the short-term loss of recreational uses, the project would be in compliance with the plan because it would not result in a long-term reduction of recreational uses. All recreational facilities disturbed or demolished by the project would be restored or replaced in-kind (see Section 6.2.8).

The Lewis River Shoreline Management Plan (PacifiCorp 2014) provides guidance for management of shoreline areas (lands within the elevation contour 10 feet above the OHWL) for Yale Reservoir, which includes the proposed area. The proposed action is consistent with the requirements of the Lewis River Shoreline Management Plan because it does not alter shoreline uses and because the proposed construction would be conducted in compliance with Cowlitz County and state shoreline regulations (see Section 6.2.4).

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8.0 List of Preparers

AECOM

Kim Anderson, PWS, Senior Ecologist

Paul Hamidi, PWS, CPPS, Senior Wetland and Soil Scientist

Linda Howard, Senior Environmental Planner

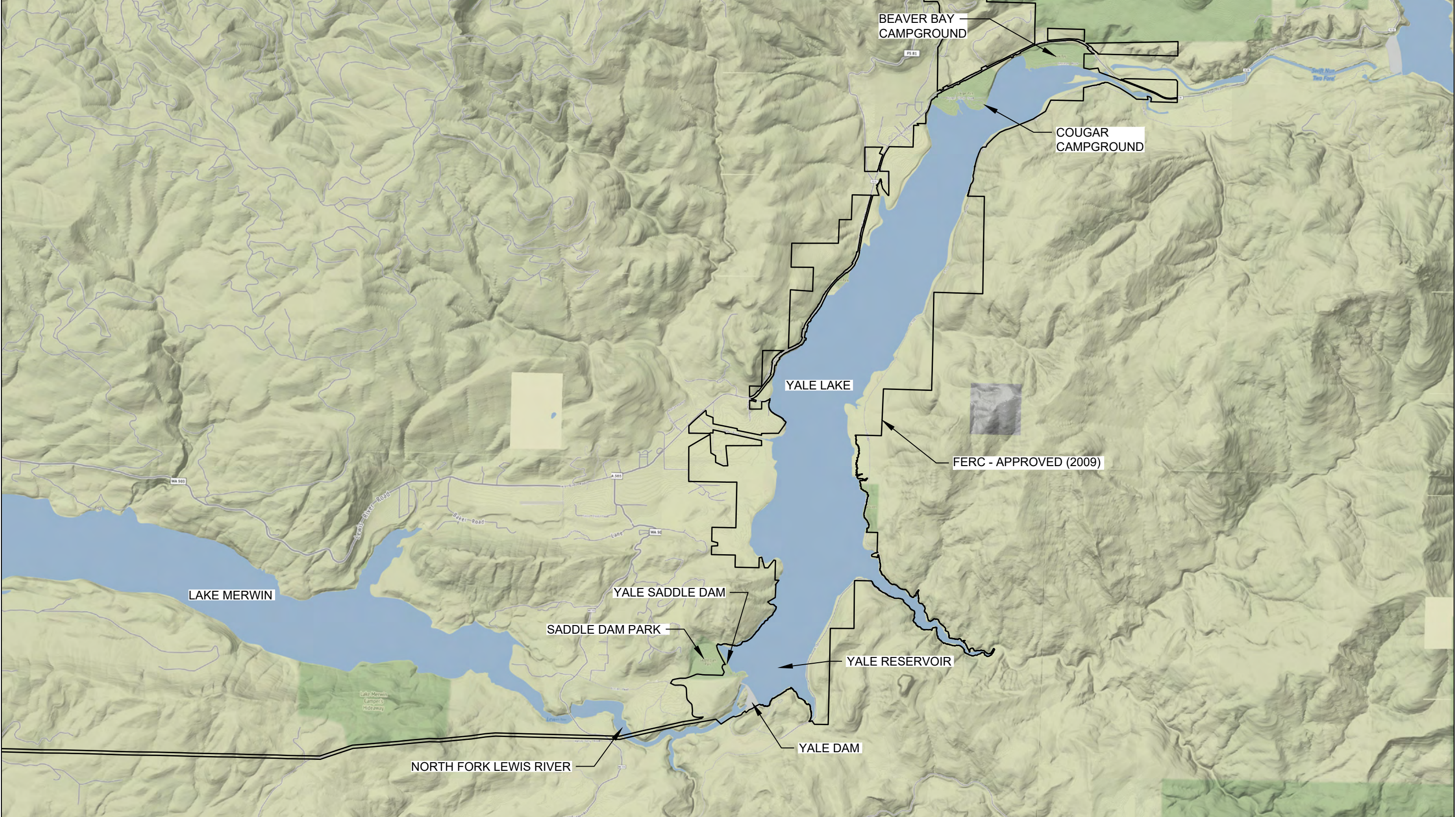
Jenifer King, Senior Environmental Planner


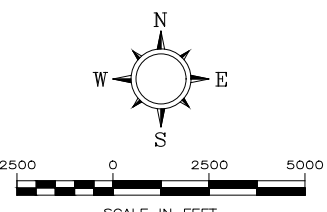

Jeff Walker, PWS, Biologist and Permitting Specialist

Maralee Wernz, RPA, Archaeologist

EXHIBIT E

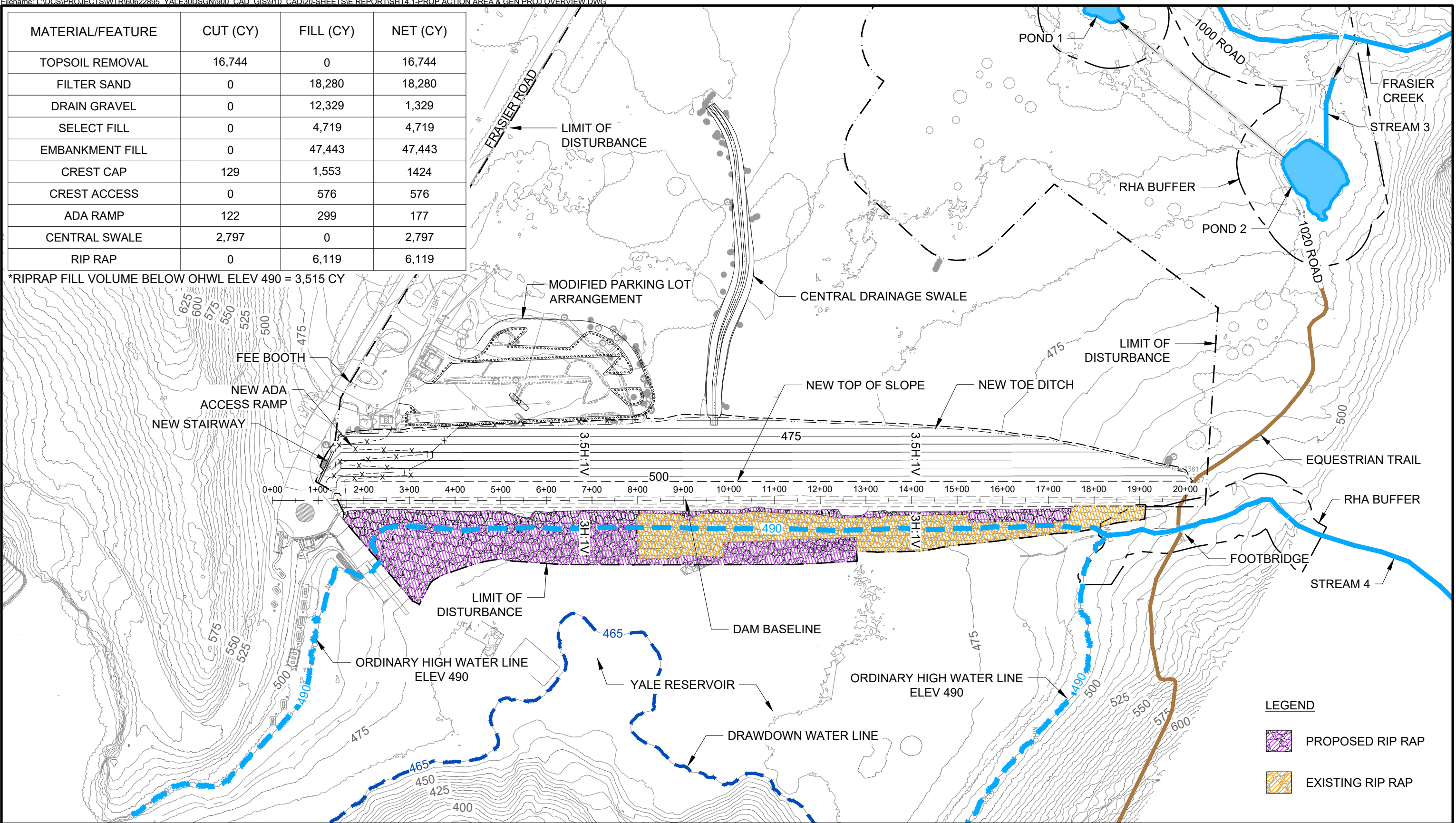
ATTACHMENT A - FIGURES



<p>Applicant:</p>  <p>PACIFICORP A BERKSHIRE HATHAWAY ENERGY COMPANY</p>	<p>Yale Hydroelectric Project (FERC No. P-2017) Application for License Amendment Exhibit E - Environment Report</p>	 <p>2500 0 2500 5000 SCALE IN FEET</p>	<p>FIGURE 3-1 <i>General Map of Yale Project</i></p> 
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MATERIAL/FEATURE	CUT (CY)	FILL (CY)	NET (CY)
TOPSOIL REMOVAL	16,744	0	16,744
FILTER SAND	0	18,280	18,280
DRAIN GRAVEL	0	12,329	1,329
SELECT FILL	0	4,719	4,719
EMBANKMENT FILL	0	47,443	47,443
CREST CAP	129	1,553	1424
CREST ACCESS	0	576	576
ADA RAMP	122	299	177
CENTRAL SWALE	2,797	0	2,797
RIP RAP	0	6,119	6,119

*RIPRAP FILL VOLUME BELOW OHWL ELEV 490 = 3,515 CY



Yale Hydroelectric Project (FERC No. P-2017)
Application for License Amendment
Exhibit E - Environment Report

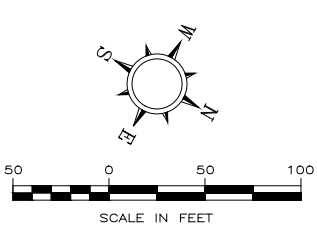
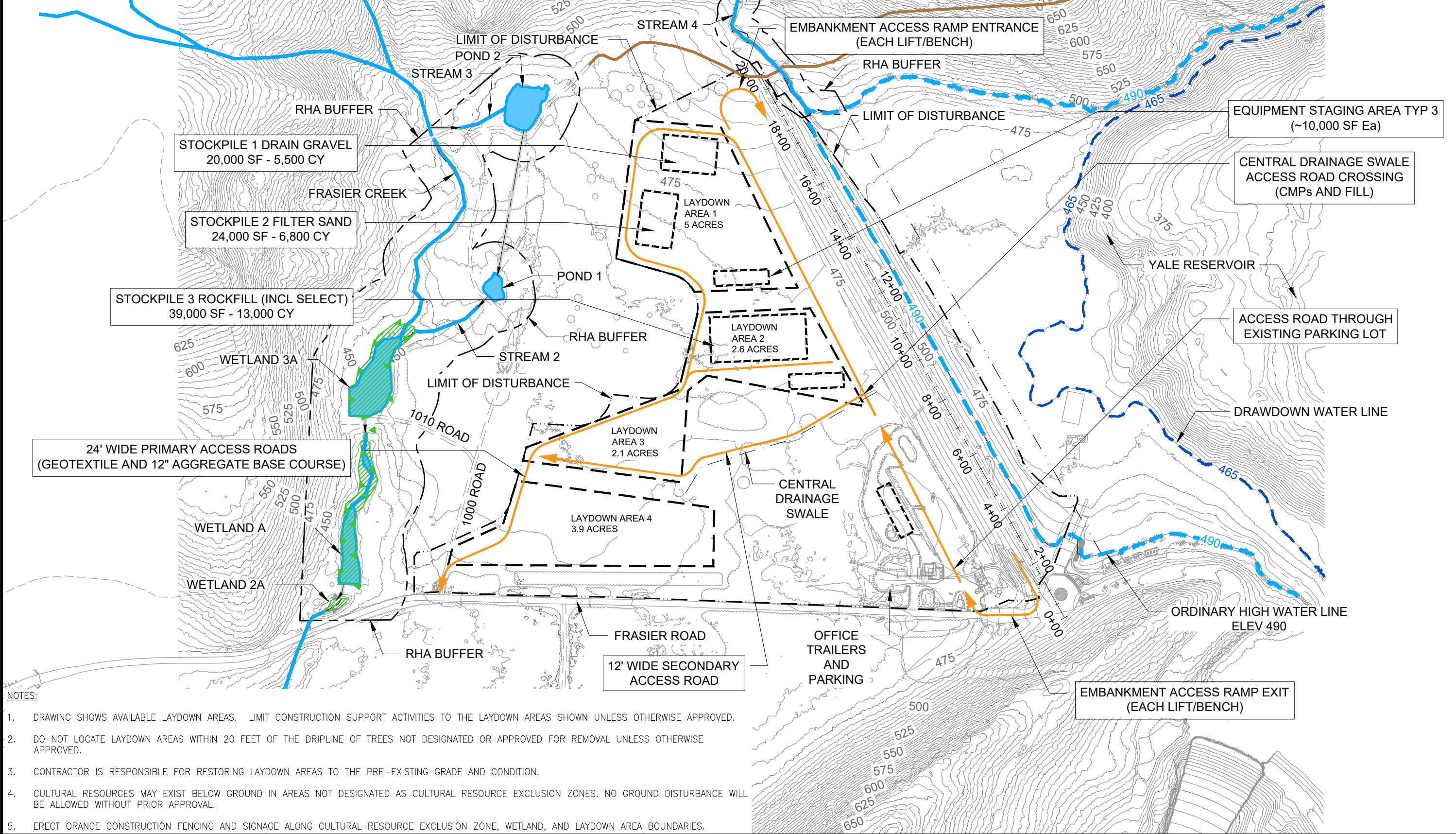
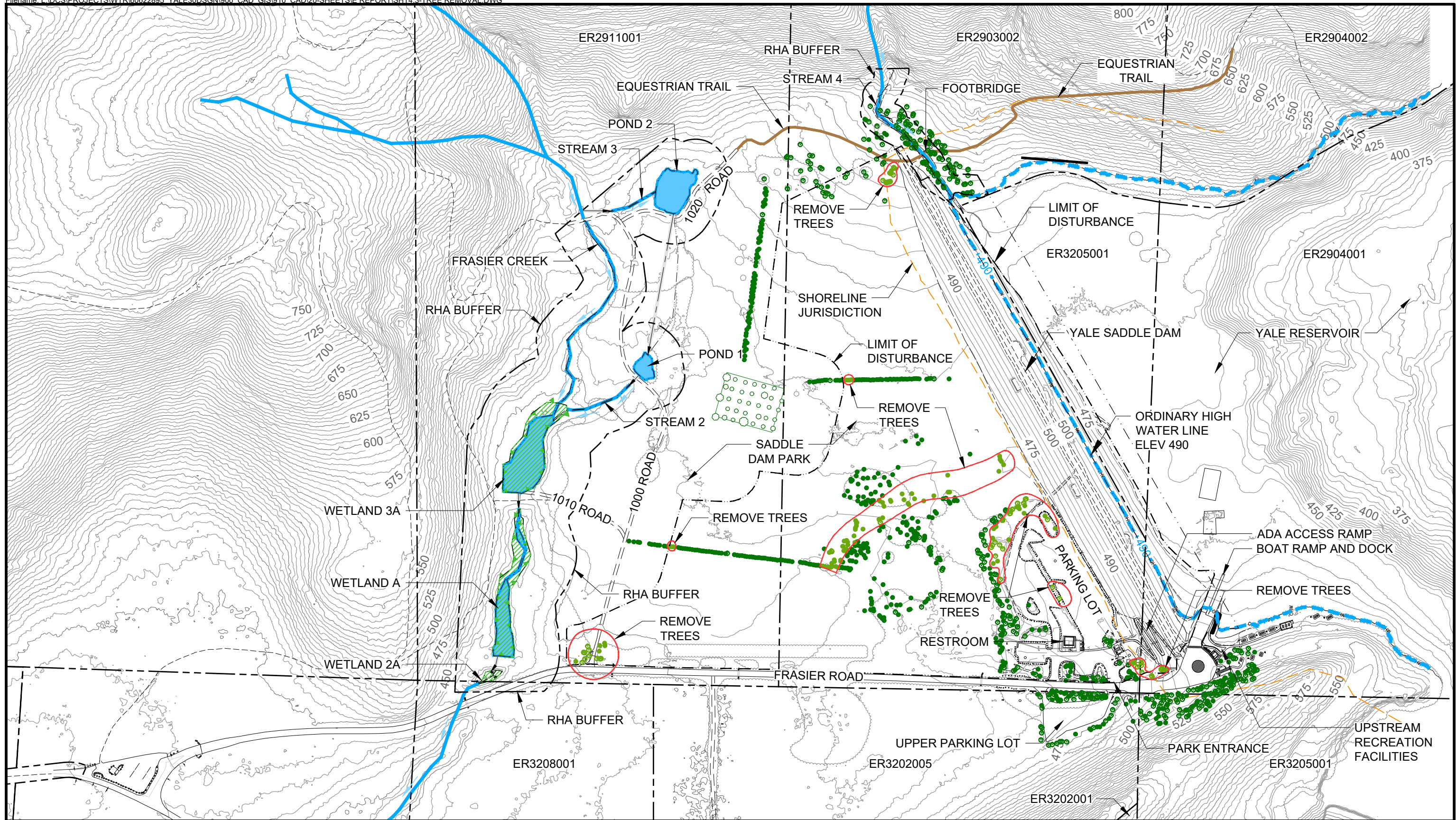


FIGURE 4-1
*Proposed Action Area and General
Project Overview*







Yale Hydroelectric Project (FERC No. P-2017)
Application for License Amendment
Exhibit E - Environment Report

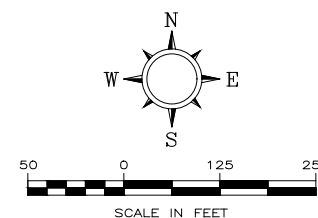
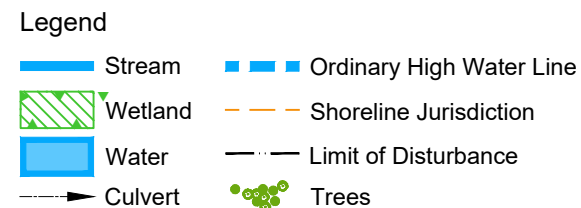
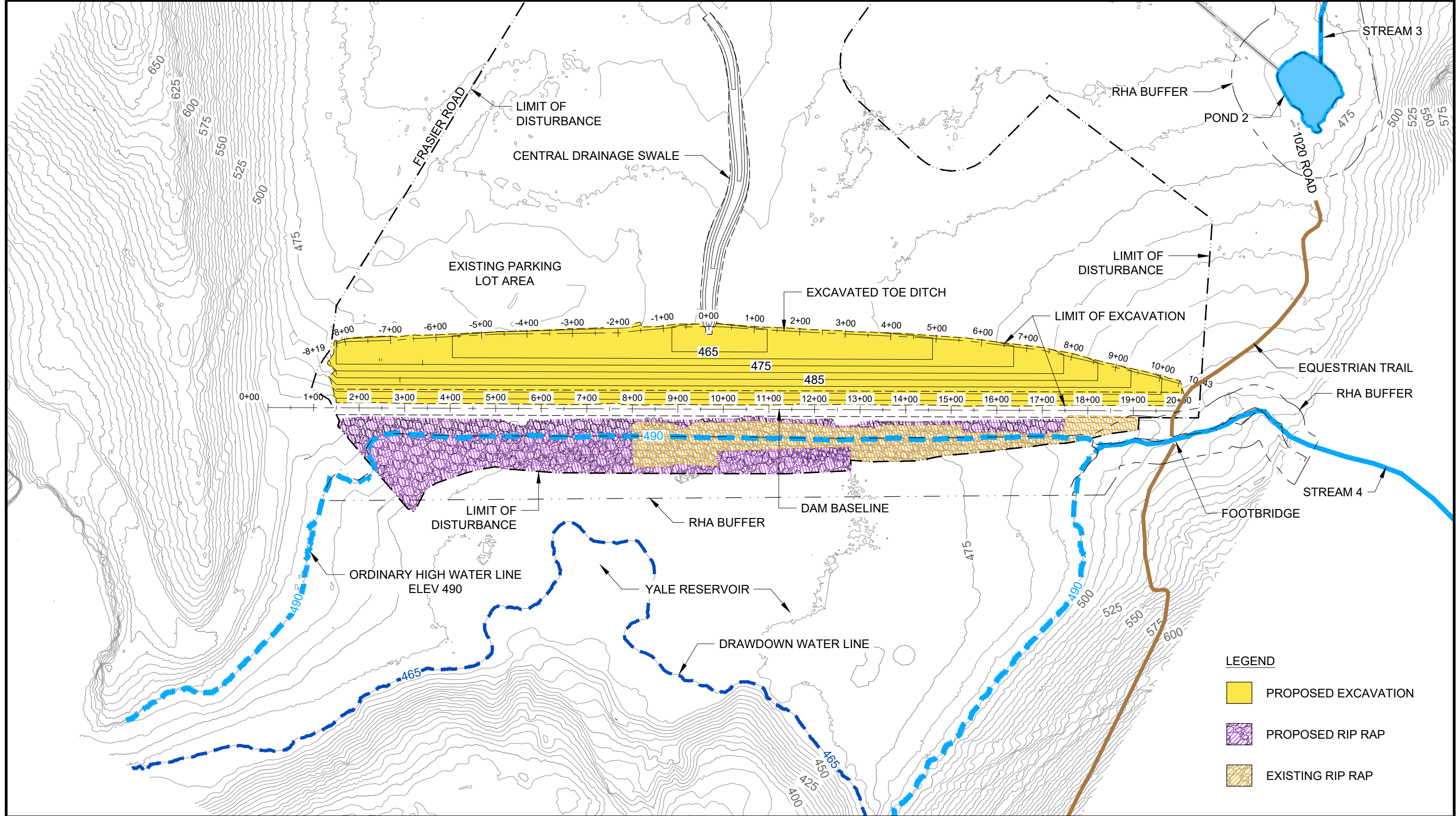


FIGURE 4-3
Tree Removal



LEGEND

- PROPOSED EXCAVATION
- PROPOSED RIP RAP
- EXISTING RIP RAP



Yale Hydroelectric Project (FERC No. P-2017)
Application for License Amendment
Exhibit E - Environment Report

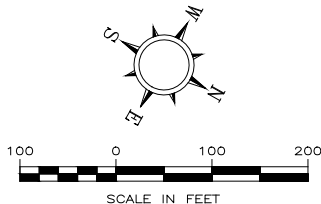
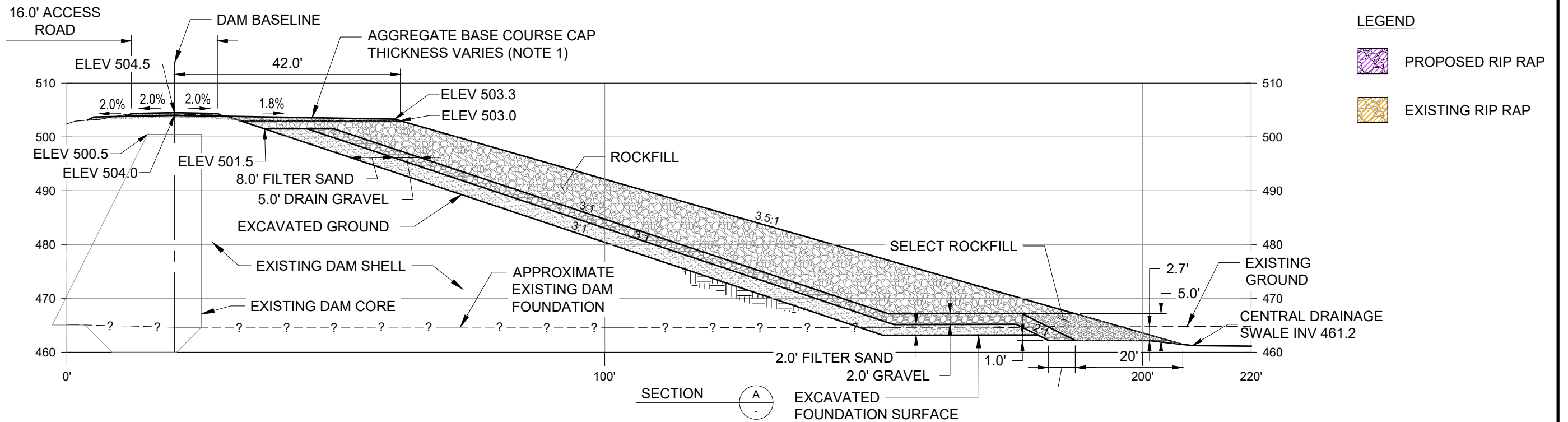
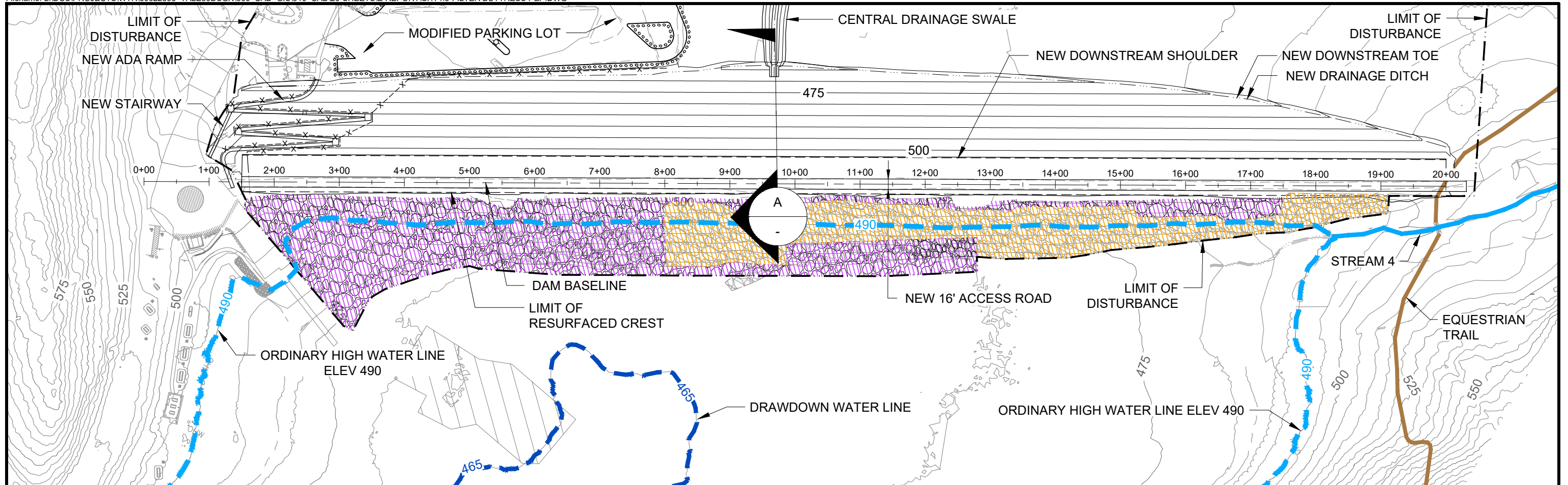


FIGURE 4-4
Dam Excavation Plan





- LEGEND**
- PROPOSED RIP RAP
 - EXISTING RIP RAP



Yale Hydroelectric Project (FERC No. P-2017)
Application for License Amendment
Exhibit E - Environment Report

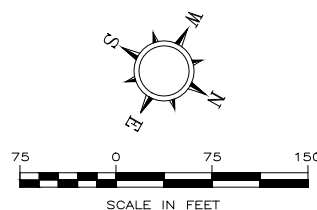


FIGURE 4-5
Filter and Drain Berm Plan and Section



Applicant:
PACIFICORP
A BERKSHIRE HATHAWAY ENERGY COMPANY

Yale Hydroelectric Project (FERC No. P-2017)
 Application for License Amendment
 Exhibit E - Environment Report

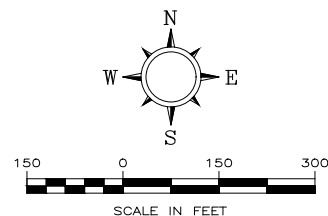
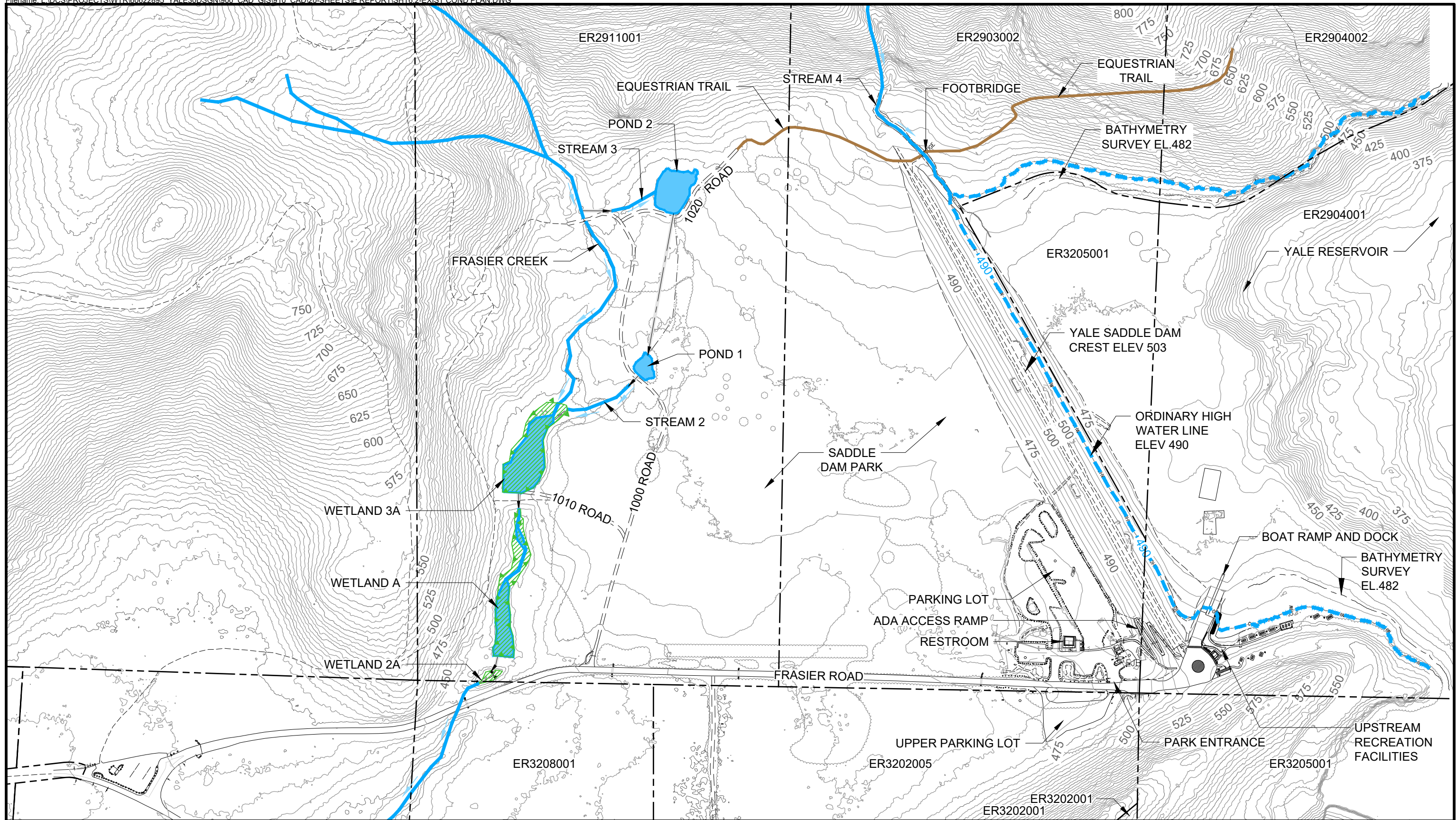


FIGURE 6-1
Project Site - General Overview Map



Yale Hydroelectric Project (FERC No. P-2017)
Application for License Amendment
Exhibit E - Environment Report

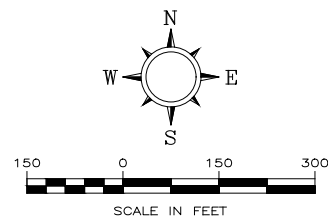


FIGURE 6-2
Project Site - Existing Conditions Map

EXHIBIT E

ATTACHMENT B - CONSULTATION RECORD

**Yale Hydroelectric Project (FERC No. P-2071)
Yale Saddle Dam Remediation Project
Draft License Amendment Application to FERC
Comments and Responses**

No.	Agency	Section or Page No.	Review Comment	Response
1	WDFW	Exhibit E	Saddle Dam Park is used to collectively reference Saddle Dam Farm and Saddle Dam recreational facilities throughout Exhibit E of the draft Application. It is also used interchangeably to refer to just the Saddle Dam Farm or just the recreational facilities. When discussing a feature or activity associated with one or the other of the sites, please consider using the designations found in Article 405 Recreation Resource Management Plan (PacifiCorp 2020; Recreation Plan). The Recreation Plan refers to the recreational facilities as Saddle Dam Park and Saddle Dam Park Day Use and the wildlife area as Saddle Dam Farm. Please consider using Saddle Dam Farm or Saddle Dam Park Day Use, as appropriate, instead of the collective Saddle Dam Park. "Saddle Dam Park is open annually from Memorial Day weekend through Labor Day..." (page 42 Exhibit E) is one example where information applies to the Saddle Dam Day Use but not the Saddle Dam Farm. Saddle Dam Farm is open to the public year-round as opposed to Memorial Day weekend through Labor Day. Saddle Dam Farm is open to the public year-round for non-motorized use, including hunting and enjoying wildlife. The impact to the public using the Saddle Dam Day Use is approximately three months per year whereas Saddle Dam Farm will not be available for recreational opportunities for the duration of the remediation project (approximately 18 to 24 months) and the restoration of the fields and meadows. Recreationalists will not be able to use Saddle Dam Farm until the forage grass is established (approximately three months to a year depending on germination and growth conditions). Utilizing Saddle Dam Day Use and Saddle Dam Farm instead of Saddle Dam Park and adding recreational impacts associated with construction access and staging at Saddle Dam Farm will improve the evaluation of lost recreational opportunity.	Requested designations (Saddle Dam Park Day Use and Saddle Dam Farm) have been made throughout Exhibit E.
2	WDFW	Exhibit E	As noted in Exhibit E, impacts to Saddle Dam Farm include permanent loss of 1.2 acres of forage fields to the encroachment of the dam extension; temporary loss of approximately 15 acres for construction access and staging eliminating wildlife benefits until restored to current condition; and removal of approximately 140 to 150 trees that provide screening for elk using the forage fields. In addition to the permanent and temporary physical loss of the Saddle Dam	Edits have been made to include the loss of noted recreation opportunities on the disturbed portions of the Saddle Dam Farm. Please see Section 6.2.8.2.1 of the document.

No.	Agency	Section or Page No.	Review Comment	Response
			Farm wildlife habitat, Exhibit E acknowledges the displacement of wildlife from lands both inside and outside the construction project boundary due to construction noise and temporary roads. Not addressed in Exhibit E, as mentioned above, is the loss of recreational opportunities such as hunting and wildlife viewing until such time that the fields and meadows are restored, and wildlife begin to utilize Saddle Dam Farm again.	
3	WDFW	Exhibit E	All WHMP lands are important for the mitigation of the continued operation of the Lewis River hydroelectric facilities. In particular, Saddle Dam Farm provides critical winter elk habitat and a source for year-round forage in the developing lowlands. WDFW is encouraged PacifiCorp is proposing as mitigation restoring construction access and staging areas to meet the Lewis River WHMP requirements for high-quality forage habitat for elk; providing compensatory mitigation for the permanent loss of WHMP land and 3:1 replacement for the removal of trees; and compensating for the temporary loss of habitat use on WHMP lands during construction. At this time, PacifiCorp and the Terrestrial Coordinating Committee (TCC) have not determined the monetary value to provide sufficient compensatory mitigation. WDFW encourages PacifiCorp to provide an amount that will meet or exceed the net ecological benefits permanently and temporarily lost during the Yale Saddle Dam Seismic Remediation Project as determined by the TCC. We suggest an agreement be reached before construction begins.	On March 8, 2023 PacifiCorp shared a PacifiCorp Memorandum identifying the TCC decision on mitigation for impacts to wildlife and wildlife habitat of the Yale Saddle Dam Seismic Remediation Project. A total compensatory mitigation amount has been identified and agreed to by the TCC and PacifiCorp.
4	WDFW	Exhibit E Pages 25 and 37	"However, conducting the drawdown during the winter months would minimize impacts to fish due to the loss of littoral habitat, as most fish species that overwinter in the reservoir move into the deeper pelagic zones during this time." Please provide a citation identifying specific empirical evidence to support this statement or identify the statement as an assumption.	Changes have been made to various sections of the document to reflect this is an assumption.
5	WDFW	Exhibit E	"PacifiCorp anticipates conducting the drawdown during a 2-week period in December and/or January during periods of normally low reservoir pool elevations." The Exhibit E does not provide the rate at which the drawdown will occur. Please include a drawdown rate, that along with conducting the drawdown in the winter months, will minimize stranding.	A drawdown rate of 1 foot per hour has been identified within the document. Please see Section 6.2.4.2.1 of the document.
6	WDFW	Exhibit E	Please address potential impacts of the drawdown on Yale Park, specifically if the boat ramp will be operational at 465 feet amsl elevation. The kokanee fishery is very popular and productive during the December/January timeframe. Even though the drawdown is estimated to last 2 weeks, please consider public outreach, if	The Yale Park boat ramp is operational to a reservoir surface elevation of 468 feet. During the two week project drawdown period, boater access will be limited to small hand launch water craft. Section 6.2.8.1.3 Yale Park has been added to Exhibit E noting that the Yale Park boat ramp will

No.	Agency	Section or Page No.	Review Comment	Response
			necessary, regarding the usability of boat ramp at Yale Park prior to the drawdown.	be closed for the two week period and impact will occur to the kokanee recreation fishery. PacifiCorp concurs with the need for public outreach regarding notification of the dates of the Yale boat ramp closure and that Merwin reservoir will remain accessible during this period.
7	USFWS	Exhibit E Page 12	Section 4.1.3.4: Reservoir Drawdown and Riprap Rehabilitation: Please indicate the quantity of riprap to be placed, both in terms of volume (cubic yards) and surface area (acreage or square feet). These quantities may be found elsewhere throughout the Draft Application (e.g. Figure 4-1), but, for clarity, we recommend indicating these quantities in this section, as well.	Quantity of riprap has been identified and included this section of the document.
8	USFWS	Exhibit E Page 16	Section 5.2.5: Endangered Species Act, Section 7: The Draft Application states, "The Biological Opinions for the FERC relicensing of the Lewis River Hydroelectric Projects, published by USFWS in 2006 and by NMFS in 2007, address most activities under the proposed action (USFWS 2006; NMFS 2007)." While we are inclined to believe that most activities are addressed in our 2006 Biological Opinion for the relicensing of the Project, we would appreciate further clarification within this document as to how the activities, especially those on the upstream side of Saddle Dam, are addressed in our 2006 Biological Opinion.	PacifiCorp is currently preparing supplemental ESA documentation to address aspects of the proposed action that are not addressed in the prior Biological Opinions. PacifiCorp has initiated Section 7 consultation with NMFS and USFWS.
9	USFWS	Exhibit E Pages 26 and 38	Section 6.2.4.2.3: Proposed Protection Measures and Analysis (page 26) and Section 6.2.6.2.3 (page 38): During drawdown of Yale Reservoir, PacifiCorp would deploy crews at "strategic locations" around the reservoir and conduct fish salvage as needed. First, we ask PacifiCorp to elaborate on where these strategic locations are and how they have been, or will be, identified. Second, as an additional protection measure, we request that PacifiCorp identify and implement a drawdown rate that would minimize stranding and trapping risk by providing fish safe egress from the project area.	Requested information now included within this section of the document.
10	USFWS	Exhibit E Page 34	Section 6.2.5.2.3: Proposed Protection Measures and Analysis: To mitigate for project impacts to wildlife and Wildlife Habitat Management Plan (WHMP) lands, the Draft Application indicates PacifiCorp would contribute additional funds into the Lewis River Mitigation Fund; PacifiCorp would consult with the Lewis River Terrestrial Coordination Committee (TCC) to determine a mitigation funding amount. We support this approach and request that PacifiCorp and FERC accept the forthcoming recommendations of the TCC as it relates to mitigation funds for project impacts to WHMP lands.	On March 8, 2023 PacifiCorp shared a PacifiCorp Memorandum identifying the TCC decision on mitigation for impacts to wildlife and wildlife habitat of the Yale Saddle Dam Seismic Remediation Project. A total compensatory mitigation amount has been identified and agreed to by the TCC and PacifiCorp.

No.	Agency	Section or Page No.	Review Comment	Response
11	USFWS	Exhibit E Pages 36-37	Section 6.2.6.2.1: Construction-Related Effects (pages 36-37): The Draft Application fails to describe project-related effects to bull trout Designated Critical Habitat. Please include.	A bullet regarding project-related effects on bull trout Designated Critical Habitat has been added to this section of the document.



State of Washington
DEPARTMENT OF FISH AND WILDLIFE

Mailing Address: PO Box 43200, Olympia, WA 98504-3200 · 360 902-2200 · TDD 360 902-2207
Main Office Location: Natural Resources Building, 1111 Washington Street, Olympia, WA

March 8, 2023

Beth Bendickson
Senior Business Administrator
PacifiCorp Renewable Resources
825 NE Multnomah, Suite 1800
Portland, OR 97232

RE: Yale Hydroelectric Project (FERC No. P-2071)
Draft Application for Non-Capacity Amendment of License for a Major Project

Dear Ms. Bendickson:

Washington Department of Fish and Wildlife (WDFW) appreciates this opportunity to comment on the Yale *Draft Application for Non-Capacity Amendment of License for a Major Project* (Application) pursuant to the PacifiCorp Yale Hydroelectric Project No. 2071 FERC License and the Lewis River Settlement Agreement. WDFW has read the draft Application for the Yale Saddle Dam Seismic Remediation Project and we provide our comments below.

The Washington Department of Fish and Wildlife is tasked with preserving, protecting, and perpetuating fish, wildlife, and ecosystems, while providing sustainable fishing, hunting, and other recreation opportunities. To ensure the highest level of resource protection WDFW appreciates the opportunity to work cooperatively with PacifiCorp to implement the Yale Project Hydroelectric License and the Lewis River Settlement Agreement.

WDFW would like to commend PacifiCorp for the thoughtful evaluation of fish, wildlife and the recreational opportunities impacted by the Yale Saddle Dam Seismic Remediation Project.

Comments

- Saddle Dam Park is used to collectively reference Saddle Dam Farm and Saddle Dam recreational facilities throughout Exhibit E of the draft Application. It is also used interchangeably to refer to just the Saddle Dam Farm or just the recreational facilities. When discussing a feature or activity associated with one or the other of the sites, please consider using the designations found in Article 405 *Recreation Resource Management Plan* (PacifiCorp 2020; Recreation Plan). The Recreation Plan refers to the recreational facilities as Saddle Dam Park and Saddle Dam Park Day Use and the wildlife area as Saddle Dam Farm. Please consider using Saddle Dam Farm or Saddle Dam Park Day Use, as appropriate, instead of the collective Saddle Dam Park. "Saddle Dam Park is open annually from Memorial Day weekend through Labor Day..." (page 42 Exhibit E) is one example where information applies to the Saddle Dam Day Use but not the Saddle Dam Farm. Saddle Dam Farm is open to the public year-round as opposed to Memorial Day weekend through Labor Day.

Saddle Dam Farm is open to the public year-round for non-motorized use, including hunting and enjoying wildlife. The impact to the public using the Saddle Dam Day Use is approximately three months per year whereas Saddle Dam Farm will not be available for recreational opportunities for the duration of the remediation project (approximately 18 to 24 months) and the restoration of the fields and meadows. Recreationalists will not be able to use Saddle Dam Farm until the forage grass is established (approximately three months to a year depending on germination and growth conditions). Utilizing Saddle Dam Day Use and Saddle Dam Farm instead of Saddle Dam Park and adding recreational impacts associated with construction access and staging at Saddle Dam Farm will improve the evaluation of lost recreational opportunity.

- PacifiCorp protects, mitigates, and enhances habitat on lands owned and managed by PacifiCorp for wildlife *"...to offset habitat impacts and associated wildlife losses resulting from the continued operation of the Lewis River Hydroelectric Projects..."* (PacifiCorp 2008). These lands are managed under the PacifiCorp 2008 *Lewis River Wildlife Habitat Management Plan* (WHMP). Saddle Dam Farm is part of Management Unit 10 associated with the WHMP.

As noted in Exhibit E, impacts to Saddle Dam Farm include permanent loss of 1.2 acres of forage fields to the encroachment of the dam extension; temporary loss of approximately 15 acres for construction access and staging eliminating wildlife benefits until restored to current condition; and removal of approximately 140 to 150 trees that provide screening for elk using the forage fields. In addition to the permanent and temporary physical loss of the Saddle Dam Farm wildlife habitat, Exhibit E acknowledges the displacement of wildlife from lands both inside and outside the construction project boundary due to construction noise and temporary roads. Not addressed in Exhibit E, as mentioned above, is the loss of recreational opportunities such as hunting and wildlife viewing until such time that the fields and meadows are restored, and wildlife begin to utilize Saddle Dam Farm again.

All WHMP lands are important for the mitigation of the continued operation of the Lewis River hydroelectric facilities. In particular, Saddle Dam Farm provides critical winter elk habitat and a source for year-round forage in the developing lowlands. WDFW is encouraged PacifiCorp is proposing as mitigation restoring construction access and staging areas to meet the Lewis River WHMP requirements for high-quality forage habitat for elk; providing compensatory mitigation for the permanent loss of WHMP land and 3:1 replacement for the removal of trees; and compensating for the temporary loss of habitat use on WHMP lands during construction. At this time, PacifiCorp and the Terrestrial Coordinating Committee (TCC) have not determined the monetary value to provide sufficient compensatory mitigation. WDFW encourages PacifiCorp to provide an amount that will meet or exceed the net ecological benefits permanently and temporarily lost during the Yale Saddle Dam Seismic Remediation Project as determined by the TCC. We suggest an agreement be reached before construction begins.

- The following is provided on Exhibit E pages 25 and 37: *"However, conducting the drawdown during the winter months would minimize impacts to fish due to the loss of littoral habitat, as most fish species that overwinter in the reservoir move into the deeper pelagic zones during this time."* Please provide a citation identifying specific empirical evidence to support this statement or identify the statement as an assumption.
- The Exhibit E states that *"PacifiCorp anticipates conducting the drawdown during a 2-week period in December and/or January during periods of normally low reservoir pool elevations."* The Exhibit E does not provide the rate at which the drawdown will occur. Please include a drawdown rate, that along with conducting the drawdown in the winter months, will minimize stranding.

Beth Bendickson

March 8, 2023

- Please address potential impacts of the drawdown on Yale Park, specifically if the boat ramp will be operational at 465 feet amsl elevation. The kokanee fishery is very popular and productive during the December/January timeframe. Even though the drawdown is estimated to last 2 weeks, please consider public outreach, if necessary, regarding the usability of boat ramp at Yale Park prior to the drawdown.

Thank you for the opportunity to comment on the Yale Draft Application for Non-Capacity Amendment for the Saddle Dam Seismic Remediation Project. WDFW looks forward to continuing to work with PacifiCorp to promote fish and wildlife and their habitats within the Lewis River watershed.

Please contact Peggy Miller at peggy.miller@dfw.wa.gov or (360) 688-0156 for questions regarding this letter.

Very truly yours,

A handwritten signature in blue ink, appearing to read "M. D. Garrity".

Michael Garrity

Energy, Water & Major Projects Division Manager

360-810-0877 (cell) | michael.garrity@dfw.wa.gov

References

PacifiCorp (PacifiCorp Energy). 2008. Lewis River Wildlife Habitat Management Plan (FERC Project Nos. 935, 2071, and 2111. Portland, Oregon. December 2008.

_____. 2020. 12-Year Update Recreation Resource Management Plan. Lewis River Hydroelectric Projects. FERC Project Nos. 935, 2071, and 2111. November 2020.

From: Garnett, Jeffrey A <jeffrey_garnett@fws.gov>
Sent: Wednesday, March 8, 2023 2:27 PM
To: Bendickson, Beth (PacifiCorp) <Beth.Bendickson@pacificorp.com>
Cc: Olson, Todd (PacifiCorp) <Todd.Olson@pacificorp.com>; Garnett, Jeffrey A <jeffrey_garnett@fws.gov>
Subject: [INTERNET] RE: [EXTERNAL] Yale Hydro Project - Draft Application for Amendment of License

Beth,

Please find comments of the USFWS on the Yale Hydroelectric Project Draft Application for License Amendment below. All references to sections and page numbers apply to Volume II, Exhibit E – Environmental Report.

- **Section 4.1.3.4: Reservoir Drawdown and Riprap Rehabilitation (page 12)**: Please indicate the quantity of riprap to be placed, both in terms of volume (cubic yards) and surface area (acreage or square feet). These quantities may be found elsewhere throughout the Draft Application (e.g. Figure 4-1), but, for clarity, we recommend indicating these quantities in this section, as well.
- **Section 5.2.5: Endangered Species Act, Section 7 (page 16)**: The Draft Application states, “The Biological Opinions for the FERC relicensing of the Lewis River Hydroelectric Projects, published by USFWS in 2006 and by NMFS in 2007, address most activities under the proposed action (USFWS 2006; NMFS 2007).” While we are inclined to believe that most activities are addressed in our 2006 Biological Opinion for the relicensing of the Project, we would appreciate further clarification within this document as to how the activities, especially those on the upstream side of Saddle Dam, are addressed in our 2006 Biological Opinion.
- **Section 6.2.4.2.3: Proposed Protection Measures and Analysis (page 26) and Section 6.2.6.2.3 (page 38)**: During drawdown of Yale Reservoir, PacifiCorp would deploy crews at “strategic locations” around the reservoir and conduct fish salvage as needed. First, we ask PacifiCorp to elaborate on where these strategic locations are and how they have been, or will be, identified. Second, as an additional protection measure, we request that PacifiCorp identify and implement a drawdown rate that would minimize stranding and trapping risk by providing fish safe egress from the project area.
- **Section 6.2.5.2.3: Proposed Protection Measures and Analysis (page 34)**: To mitigate for project impacts to wildlife and Wildlife Habitat Management Plan (WHMP) lands, the Draft Application indicates PacifiCorp would contribute additional funds into the Lewis River Mitigation Fund; PacifiCorp would consult with the Lewis River Terrestrial Coordination Committee (TCC) to determine a mitigation funding amount. We support this approach and request that PacifiCorp and FERC accept the forthcoming recommendations of the TCC as it relates to mitigation funds for project impacts to WHMP lands.
- **Section 6.2.6.2.1: Construction-Related Effects (pages 36-37)**: The Draft Application fails to describe project-related effects to bull trout Designated Critical Habitat. Please include.

Thank for the opportunity to comment. Please reach out to me with any questions or concerns.

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(he/him/his)

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Sent: Thursday, December 8, 2022 12:42 PM

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Subject: [EXTERNAL] Yale Hydro Project - Draft Application for Amendment of License

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Hello Lewis River Aquatic Coordination Committee,

Please see the attached letter and Draft Application for Amendment of License for the Yale Hydroelectric Project.

If you have any questions on the letter or application, please contact Todd Olson.

Thank you,
~ Beth

Beth Bendickson

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