

**ENVIRONMENTAL ASSESSMENT  
FOR NON-CAPACITY AMENDMENT OF LICENSE**

Box Canyon Hydroelectric Project—FERC Project No. 2042-191

Washington and Idaho



Federal Energy Regulatory Commission  
Office of Energy Projects  
Division of Hydropower Administration and Compliance  
888 First Street, NE  
Washington, D.C. 20426

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## ACRONYMS AND ABBREVIATIONS

Advisory Council	Advisory Council on Historic Preservation
APE	area of potential effects
BCD	Box Canyon Dam
BCR	Box Canyon Reservoir
BIA	U.S. Bureau of Indian Affairs
°C	degrees Celsius
CCPP	Calispell Creek pumping plant
cfs	cubic feet per second
CHU	critical habitat unit
Commission	Federal Energy Regulatory Commission
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
District	Public Utility District No. 1 of Pend Oreille County
DO	dissolved oxygen
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
°F	degrees Fahrenheit
FERC	Federal Energy Regulatory Commission
FPA	Federal Power Act
Forest Service	U.S. Forest Service
FWS	U.S. Fish and Wildlife Service
HPMP	Historic Properties Management Plan
Idaho DFG	Idaho Department of Fish and Game
Interior	U.S. Department of the Interior
KIR	Kalispel Indian Reservation
KNRD	Kalispel Natural Resources Department

LPO	Lake Pend Oreille
mg/l	milligrams per liter
mm	millimeter
National Register	National Register of Historic Places
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
OLSA	Off-License Settlement Agreement
PA	Programmatic Agreement
PBF	physical and biological features
pH	hydrogen ion concentration
PNC	Ponderay Newsprint Company
PUD	Public Utility District No. 1 of Pend Oreille County
RM	river mile
SHPO	State Historic Preservation Officer
TDG	total dissolved gas
THRP	Trout Habitat Restoration Program
TMDL	Total Maximum Daily Load
Tribe	Kalispel Tribe of Indians
Washington DFW	Washington Department of Fish and Wildlife
Washington DOE	Washington Department of Ecology
WQC	water quality certification

# ENVIRONMENTAL ASSESSMENT

Federal Energy Regulatory Commission  
Office of Energy Projects  
Division of Hydropower Administration and Compliance  
Washington, D.C.

## Box Canyon Hydroelectric Project FERC Project No. 2042-191— Washington and Idaho

### 1.0 INTRODUCTION

Application Type: Non-Capacity License Amendment

Date Filed: June 10, 2019

Applicant's Name: Public Utility District No. 1 of Pend Oreille County,  
Washington

Waterbody: Pend Oreille River

County and State: Pend Oreille County, Washington, and Bonner County,  
Idaho

Federal Lands: The project occupies federal lands within the Kalispel  
Indian Reservation and federal lands managed by the U.S.  
Forest Service within the Colville National Forest.

#### 1.1 Project Description

The Federal Energy Regulatory Commission (Commission) issued a license for the Box Canyon Hydroelectric Project (FERC No. 2042) to the Public Utility District No. 1 of Pend Oreille County (District or licensee) on July 11, 2005 (2005 License Order).<sup>1</sup> The project is located on the Pend Oreille River in Pend Oreille County, Washington, and Bonner County, Idaho. The project occupies 190.25 acres within the Colville National Forest and 493.03 acres of land within the Kalispel Indian Reservation (KIR). The national forest lands are under the U.S. Forest Service (Forest Service) supervision, and the Kalispel Reservation lands are under the U.S. Department of the Interior's (Interior) supervision (Figure 1). The license expires in 2055.

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<sup>1</sup> *Pub. Util. Dist. No. 1 of Pend Oreille Cnty.*, 112 FERC ¶ 61,055 (2005).

The project dam is located at river mile (RM) 34.4 of the Pend Oreille River, downstream of the Army Corps of Engineers' (Corps) Albeni Falls Hydroelectric Project (at RM 90.1) and discharges directly into the reservoir of Seattle City Light's (SCL) Boundary Hydroelectric Project (FERC No. 2144)<sup>2</sup> (RM 17). The major project features include: (a) Box Canyon Dam (BCD), a 62-foot-high, 260-foot-long concrete structure with an integral spillway; (b) a powerhouse containing four generating units with a combined capacity of 90 megawatts; (c) an 8,850-acre reservoir at a maximum operating pool elevation of 2,030.6 feet above mean sea level, as measured at the dam; and (d) the Calispell Creek pumping plant (CCPP), located about 30 miles upstream of the BCD at RM 0.5 on Calispell Creek (a tributary to the Pend Oreille River), which includes two pumping stations, outlet works, gates, culverts, and the railroad dike.

The project is a run-of-river facility that does not store water for power generation, but its gated spillway backs up the Pend Oreille River approximately 55 miles to Albeni Falls Dam. The normal elevation of the water surface at BCD is 2030.6 feet above mean sea level. The water surface is maintained using the spillway gates and the powerhouse hydraulic capacity (turbine capacity). When flows exceed the project's turbine capacity of 32,000 cubic feet per second (cfs), the spillway gate sections are incrementally raised out of the water to maintain run-of-river operation, and are lowered when the flow decreases. Flows greater than powerhouse capacity can occur at any time of year, but generally occur during the months of April, May and June. The licensee has upgraded all four of its turbines, which are vertical adjustable-blade propeller (Kaplan) turbines structured with four runner blades (instead of the original five blades in the old units). In addition to providing a more fish friendly feature, the upgraded turbines increase flow through the plant and reduce the time spill occurs. The licensee also completed spill gate modifications in spring 2015 to allow the spill gates to be raised in such a way as to provide a more horizontal flow rather than a plunging flow, which benefits water quality by reducing the amount of gas entrained during periods of spill.

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<sup>2</sup> SCL is the owner and licensee for the Boundary Hydroelectric Project No. 2144, which is located on the Pend Oreille River downstream of the Box Canyon Dam.

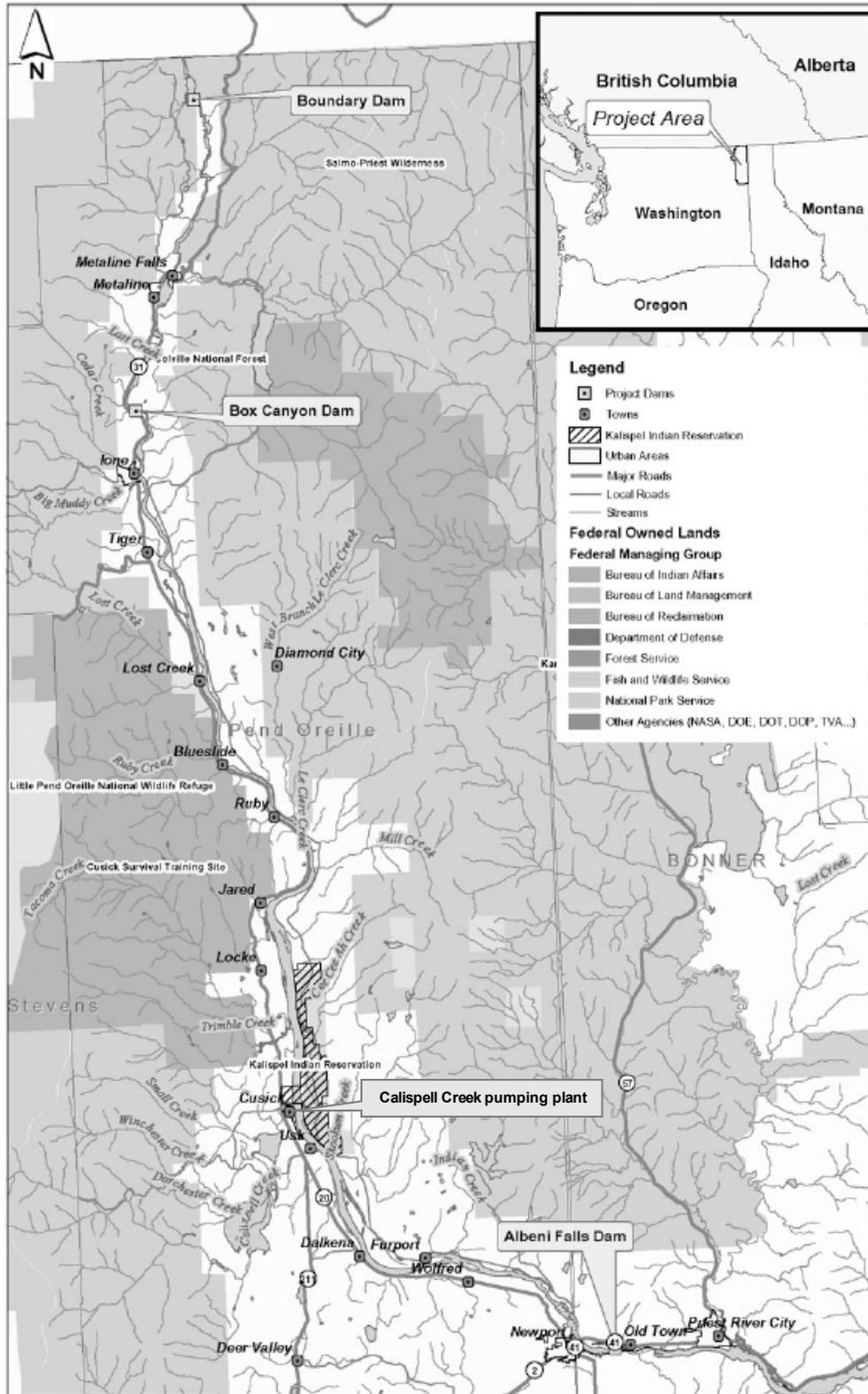


Figure 1. Location of the Box Canyon Project (Source: FERC 2004, modified by staff).

The licensee operates the CCPP, which is located about 30 miles upstream of the BCD near the mouth of Calispell Creek (a tributary of the Pend Oreille River). The pumping plant was originally constructed in the early 1900s to prevent flooding of agricultural lands along the Pend Oreille River. The plant pumps water from Calispell Creek over a railroad dike (near the mouth of the creek) into the project reservoir.<sup>3</sup> The pumping plant consists of two pump stations with six pumps and a total hydraulic capacity of 530 cfs. Operation of the CCPP allows the PUD to maintain a higher reservoir elevation for the project without flooding lands along Calispell Creek and thus produce more power. The pumps are operated under an agreement (Plan E) between the licensee and Diking District No. 2 of Pend Oreille County which describes how the pump plant operation is to be coordinated with Box Canyon operations. Plan E provides for the plant to be operated in high-flow conditions in a manner that approximates flow conditions in Calispell Creek that existed prior to the construction of BCD. This ensures that water levels in Calispell Creek do not exceed water levels in the reservoir under the current backwater constraint at Albeni Falls Dam, thus preventing flooding of lands near Calispell Creek. Article 404 of the 2005 License Order requires the licensee to operate CCPP in accordance with Plan E, and Plan E is attached as Appendix F of the 2005 License Order.

Construction of an upstream trap and haul fishway is currently underway at the BCD, in accordance with license requirements, and is expected to be operational in October 2021.<sup>4</sup> The facility will provide upstream fish passage in the Pend Oreille River for native species between Boundary Dam and Albeni Falls Dam, allowing native species uninhibited access to 55 miles of the Box Canyon Reservoir (BCR) and associated tributaries. Downstream fish passage at BCD currently occurs via the turbines and/or over the spillway during spill. There are no fish passage facilities at CCPP.

In part and as pertinent here, the 2005 License Order, revised on rehearing in 2006,<sup>5</sup> includes mandatory conditions<sup>6</sup> submitted by Interior under section 4(e) and section 18 of the Federal Power Act (FPA). Following this, the licensee, Interior, Forest Service, the Kalispel Tribe of Indians (Tribe), and the Ponderay Newsprint Company

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<sup>3</sup> The railroad dike is owned by the Diking District No. 2 of Pend Oreille County, while the majority of the pumping plant is located on lands within the KIR.

<sup>4</sup> Order Approving Extension of Time and Fishway Schedule Amendment Pursuant to Article 401, issued on Mar. 18, 2021.

<sup>5</sup> *Pub. Util. Dist. No. 1 of Pend Oreille Cnty.*, 117 FERC ¶ 61,205 (2006).

<sup>6</sup> Here, mandatory means the Commission's obligation to include them in any license it issues. See 16 U.S.C. §§ 797(e) and 810.

(PNC) (collectively, settlement parties) completed negotiations and executed a settlement agreement on January 28, 2009, with the purpose of resolving issues that were pending before the United States Court of Appeals for the District of Columbia Circuit regarding the 4(e) conditions and section 18 prescriptions. The licensee filed the offer of settlement with the Commission on March 24, 2009, and Interior filed revised 4(e) conditions 6 and 13 on April 9, 2009. The Commission amended the license to include the revised conditions and prescriptions in an order issued February 19, 2010 (2010 Settlement Order).<sup>7</sup>

As relevant here, Interior's revised 4(e) condition 6 in the 2010 Settlement Order requires implementation of a Trout Habitat Restoration Program (THRP). Under the THRP, the licensee would restore 164 miles of tributary habitat in prioritized watersheds within 25 years of the 2009 Settlement Agreement effective date. Further, Interior's revised section 18 prescription in the 2010 Settlement Order requires the licensee to provide upstream and downstream fish passage facilities at BCD and at the CCPP for bull trout (*Salvelinus confluentus*), mountain whitefish (*Prosopium williamsoni*), and westslope cutthroat trout (*Oncorhynchus clarkii lewisi*) (collectively, "target species"). Additional detail about the mandatory conditions is in *Section 3.3, Statutory and Regulatory Requirements*.

## 1.2 Purpose And Need For Action

On June 10, 2019, the settlement parties filed an Offer of Settlement (2019 Settlement) to amend the settlement parties' January 28, 2009 Settlement Agreement and a request to amend the license for the Box Canyon Project. The purpose of the 2019 Settlement is to address new information collected and developed since implementation of the 2009 Settlement Agreement. The 2019 Settlement and license amendment request will: (1) revise Interior's 4(e) condition 6 THRP; (2) remove several requirements in the section 18 fishway prescription for downstream fish passage facilities at BCD and for up- and downstream fish passage facilities at CCPP; and (3) make conforming administrative revisions to articles 401 and 402 of the project license to reflect the revised conditions and prescriptions. All other sections of the 2009 Settlement Agreement remain unchanged, are in full force and effect, and are incorporated by reference in the 2019 Settlement.

The Commission must decide whether to approve the licensee's proposed amendment of the THRP and fish passage requirements at the Box Canyon Project as described in the revised mandatory conditions, and what conditions should be in any amendment order issued. In deciding whether to approve the licensee's application, the Commission must determine that the proposed action (amendment of the license to

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<sup>7</sup> *Pub. Util. Dist. No. 1 of Pend Oreille Cnty., Washington*, 130 FERC ¶ 62,148 (2010).

include the revised 4(e) condition 6 THRP and revised section 18 fishway prescription) will be best adapted to a comprehensive plan for improving or developing a waterway. In addition to power and development, the Commission must give equal consideration to the purposes of energy conservation, the protection, mitigation of damage to and enhancement of fish and wildlife (including related spawning grounds and habitat), the protection of recreational opportunities, and the preservation of other aspects of environmental quality.

In accordance with the National Environmental Policy Act (NEPA) of 1969 and the Commission's regulations (18 CFR Part 380), this Environmental Assessment (EA) assesses the environmental effects of the proposed action and the No-Action Alternative. Important issues that are addressed include fish passage, threatened and endangered species, and fisheries habitat restoration.

## **2.0 PROPOSED ACTION AND ALTERNATIVES**

### **2.1 Proposed Action**

The licensee is proposing to amend the license to incorporate revised mandatory conditions filed by Interior on June 10, 2019, as described above. Project operation would not change, and the amendment does not require any new construction.

The revised 4(e) condition 6 THRP would require development of a Comprehensive Plan, through which the licensee would work with other stakeholders in the Pend Oreille River basin to develop goals for habitat restoration, prioritize restoration areas, establish how goals would be achieved (success criteria), and conduct monitoring to ensure that goals are being met. The success criteria would be identified for each restoration project and monitored over time to determine whether the criteria is met. If a restoration project fails to meet the identified success criteria, then the licensee would develop a remediation plan to correct the deficiencies. The Comprehensive Plan required under the revised THRP would facilitate future planning and project proposal development and may facilitate various regulatory approval processes by allowing programmatic review and approval of restoration efforts. The revised THRP maintains the 25-year restoration schedule for 164 miles of tributary habitat, but does not specify the spending limitations for the restoration measures. Other revisions to the THRP would better reflect the actual practice and future preferences of the Technical Committee,<sup>8</sup> developed over 13 years of cooperative experience, and do not materially change the substantive goals and conditions of the THRP. The restoration measures that may be enacted (e.g., channel improvements limited to geomorphologic improvements and

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<sup>8</sup> The Technical Committee includes the Licensee, Department of Interior (Bureau of Indian Affairs and U.S. Fish and Wildlife Service), U.S. Forest Service, Washington Department of Fish and Wildlife, the Kalispel Tribe, and Idaho Department of Fish and Game.

barrier removal; floodplain restoration; riparian corridor restoration; fencing; conservation easements and/or purchases; non-native fish removal; and reintroduction or supplementation of target fish species) and the target watersheds (e.g., Calispell, Cee Cee Ah, Cedar, LeClerc, Indian, Mill, Ruby, and Tacoma Creek watersheds) under the revised THRP are the same as the current THRP requirements.

The revised section 18 fishway prescriptions would not affect upstream passage at BCD, but would remove the requirement for downstream fish passage at BCD during the current license term. Under the revised prescription, the licensee would be required to monitor the impacts of project operations on downstream passage of target fish species to determine whether there are sufficient negative effects on population levels to warrant downstream fish passage at BCD. The information would be reported to the Secretary of Interior and would be used to inform whether development of downstream passage facilities is warranted. If monitoring indicates that downstream fish passage survival at the BCD is the predominant causative factor in the continued depression of target fish species populations in the lower Pend Oreille River, then the Secretary of Interior may, at his or her discretion, require the licensee to reinitiate fishway design. Specific goals of the potential facilities shall be developed over the current license term, in consultation with the Technical Committee, and shall reflect a basin-wide strategy to strengthen population levels of the target fish species to sustainable, harvestable levels. Further, if Interior determines during the current license term that a downstream passage facility at BCD is warranted, the licensee would be required to develop 60 percent design plans for downstream passage to be included in its next license application. The revised section 18 fishway prescriptions would eliminate the requirements for upstream and downstream passage at CCPP for the remainder of the current license term.

The licensee would enact the revised conditions upon receipt of approval from the Commission. The 25-year timeline for tributary restoration in the revised condition 6 THRP would continue forward and is not reset, so that the licensee would restore 164 miles of tributary habitat by February 19, 2035 (25 years after the Commission's February 19, 2010 Order on Settlement Agreement and Amending License). The Comprehensive Plan required under the revised THRP would be filed with the Commission within two years of approval of the 2019 Settlement. Pursuant to revised Section 18 Prescription, the licensee would prepare a Baseline Condition Report within 18 months of Commission approval of the 2019 Settlement Agreement, which would summarize data on the current population status and condition of target fish species in target watersheds of the Box Canyon Project reservoir (listed in the revised THRP) and Boundary Project reservoir (defined in coordination with the Technical Committee).

Articles 401 and 402 of the project license would be amended to reflect the revised condition and prescription. Article 401 lists the various plans and reports the licensee is required to prepare in consultation with state and federal agencies and for their approval, pursuant to the mandatory conditions. Article 401 requires that the plans and reports

must also be submitted to the Commission for approval, and provides a schedule for doing so. Article 401(e) specifies the schedule for filing plans and reports required by Interior's fishway prescription, and would be amended to reflect the revised prescription. Article 402 requires that within 60 days of the U.S. Fish and Wildlife Service (FWS) requesting the construction of volitional upstream fish passage facilities at BCD and/or CCPP, the licensee must provide the schedule for filing plans to construct the facilities with the Commission for approval. Article 402 would be amended to reflect the removal of upstream fish passage requirements at CCPP.

In addition to the 2019 Settlement, the licensee intends to implement a number of alternative conservation projects included in an Off-License Settlement Agreement (OLSA) executed between the licensee and the Tribe. Those conservation measures are beyond the scope of the Commission's jurisdiction, and therefore do not require the Commission's approval. While this EA analyzes the environmental effects of the OLSA in the relevant resource areas below in *Section 3.0 Environmental Analysis*, the Commission can only enforce those actions that serve project purposes and are within our jurisdiction.

## 2.2 No-Action Alternative

Under the No-Action Alternative, the licensee would not implement the revised 4(e) condition 6 or revised section 18 fishway prescriptions, but would continue to implement the license as amended by the 2010 Settlement Order.

The licensee would continue to implement the THRP pursuant to the 2010 4(e) condition 6 by restoring and maintaining the physical parameters of 164 miles of tributary habitat. The restoration schedule and financial planning specified in the condition requires the licensee to complete restoration efforts within 25 years of the 2009 Settlement Agreement for a total of \$9.25 million<sup>9</sup> over 25 years. Restoration activity proposals would need to include identification of a properly functioning system (i.e., a reference stream or reach) which would be used to develop the success criteria, and success of a restoration measure would be determined based on measurable parameters of properly functioning systems within specific reference stream reaches. In order to be considered successful, a restoration measure must meet a score of 85 percent or greater of the reference site, averaged over 3 years (if the score is not met, the restoration measure must be redesigned, abandoned, or replaced). Restoration activities in Calispell Creek would be developed and implemented as soon as possible to coincide with fish passage measures at the CCPP. Ideally, the licensee would coordinate with the Technical Committee in development of a Comprehensive Plan that would enable coordination of

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<sup>9</sup> All amounts specified in the financial planning would be adjusted at the time of payment to current dollars using the escalator set forth in Appendix E of the 2009 Settlement Agreement.

all 164 miles of restoration into a coherent basin-wide effort and facilitate future planning and proposal development and regulatory approval processes by allowing programmatic review of the restoration measures. However, the Comprehensive Plan is not solely the responsibility of the licensee and would not be required to proceed with restoration efforts.

The licensee would also continue to adhere to the section 18 fishway prescription attached to the 2010 Settlement Order. The licensee would be required to construct, operate, and maintain downstream fish passage facilities at BCD to accommodate effective (safe and timely) downstream movement of target fish species  $\geq 10.0$  inches (250 millimeters, mm) by a non-turbine route (through a fish bypass(es) and/or spillway(s)) from the forebay to the tailrace. The combined non-turbine routes shall have a fish guidance efficiency<sup>10</sup> of 95 percent for target fish species  $\geq 10.0$  inches (250 mm) in total length. The licensee would also be required to construct, operate, and maintain upstream and downstream fish passage facilities at CCPP to provide effective (safe and timely) passage of juvenile, sub-adult and adult target fish species  $\geq 4.0$  inches (~100 mm) in total length. The operational startup for downstream fish passage facilities at BCD is currently scheduled for July 2023, while the operational startup for upstream and downstream fish passage at the CCPP has been extended to January 2023 and July 2022, respectively.<sup>11</sup>

We use this alternative as the baseline environmental condition for comparison with the proposed action.

### **3.0 CONSULTATION AND COMPLIANCE**

#### **3.1 Pre-Filing Consultation**

The Commission's regulations (18 CFR section 4.38 and 6.1) require licensees to consult with appropriate resource agencies, tribes, and other entities before filing an application for an amendment of license. Pre-filing consultation must be complete and documented according to the Commission's regulations. This section describes the public outreach and resource agency consultation conducted by the licensee prior to filing its application with the Commission.

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<sup>10</sup> Fish guidance efficiency is defined as (fish passing through a non-turbine route/total fish passing the project) x 100, and will be verified by tagging fish moving downstream through BCD. Only fish that successfully pass through BCD to the tailrace area, without evidence of direct or indirect/delayed (48 hour) injury and/or mortality will be considered in meeting a 95 percent fish guidance efficiency.

<sup>11</sup> Order Granting Extension of Time, issued Oct. 10, 2019.

As described above, the licensee, Interior, Forest Service, Tribe, and PNC (collectively, settlement parties) completed negotiations and executed a settlement agreement on January 28, 2009. The Commission amended the project license in 2010 to include revised conditions and prescriptions negotiated and agreed to by the settlement parties. Since 2010, the licensee has been implementing the terms of the amended license, which requires the licensee to restore 164 miles of tributary habitat, establishes a Technical Committee that directs and oversees tributary restoration efforts, and establishes a timeline for installing upstream and downstream fishways at both BCD and CCPP. Based on new information collected and developed since the 2009 Settlement Agreement was first implemented in 2010, and with the intent of improving the processes and outcomes identified in the 2009 Settlement Agreement and more effectively addressing project effects on resources subject to Interior oversight and jurisdiction, the settlement parties have completed negotiations and entered into an Amended Settlement Agreement. Pursuant to sections 385.602 and 4.201 of the Commission's rules and regulations, on June 10, 2019, the settlement parties submitted the amended Offer of Settlement. The licensee is proposing to amend its license to substitute the revised conditions and prescriptions submitted by Interior, and requests that the Commission make conforming administrative revisions to articles 401 and 402 of the project license to reflect the revised conditions and prescriptions.

### 3.2 Public Notice

On July 9, 2019, Commission staff issued a notice of the settlement and amendment application, which set a 30-day period during which interventions, comments, and protests could be filed.<sup>12</sup> Six entities filed timely motions to intervene: Washington Department of Fish and Wildlife (Washington DFW); Tribe; Idaho Department of Fish and Game (Idaho DFG); Interior, on behalf of the Bureau of Indian Affairs (BIA) and FWS; SCL; and Forest Service. Idaho DFG and SCL also filed comments on the 2019 Settlement. There were no filings in opposition to the settlement or amendment application. Comments filed in response to the notice are addressed in the appropriate resource sections of this EA.

### 3.3 Statutory And Regulatory Requirements

The Box Canyon Project is subject to numerous requirements under the FPA and other applicable statutes. The major regulatory and statutory requirements relevant to analysis of the proposed action are described below.

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<sup>12</sup> On July 19, 2019, the Commission issued an errata notice to clarify the location of the project.

### 3.3.1 Clean Water Act

Under section 401(a)(1) of the Clean Water Act (CWA),<sup>13</sup> the Commission may not issue a license authorizing the construction or operation of a hydroelectric project unless the state water quality certifying agency has either issued a water quality certification (WQC) for the project or has waived certification by failing to act within a reasonable period of time, not to exceed one year. On December 30, 2002, Washington Department of Ecology (Washington DOE) issued a WQC for the project, which it amended on February 21, 2003.

Under section 518 of the CWA, 33 U.S.C. § 1377(e) (added in 1987), U.S. Environmental Protection Agency (EPA) is authorized to treat Indian tribes as states for purposes of certain sections of the CWA, including section 401. Section 401 requires an applicant for a federal license or permit for any activity that may result in a discharge to obtain certification from the state where the discharge originates that the activity complies with all applicable water quality standards. The CCPP discharges into BCR within the KIR. EPA issued certification for the CCPP on January 2, 2003, using Washington's water quality standards, because the Tribe's standards had not yet been approved. EPA subsequently approved the Tribe's water quality standards for the KIR on June 24, 2004. EPA's certification requires the District to mitigate for water quality impacts of waters discharged from Calispell Creek into the KIR.

Ordering paragraphs (G) and (H) of the 2005 License Order state that the new license is subject to the conditions of Washington DOE's and EPA's WQCs, as set forth in Appendices D and E, respectively.

### 3.3.2 Section 4(e) Conditions

Section 4(e) of the FPA provides that any license issued by the Commission for a project within a federal reservation, such as a National Forest or tribal land, shall be subject to and contain such conditions as the Secretary of the responsible federal land management agency deems necessary for the adequate protection and use of the reservation. On May 21, 2004, Interior filed 18 mandatory conditions under Section 4(e) of the FPA in response to the Commission's September 4, 2001, Ready for Environmental Analysis Notice for the relicensing of the Box Canyon Project.

In part and as relevant here, Interior's original 4(e) condition 6 required a plan and fund for trout assessment and restoration. The condition required the licensee to take actions that fall outside the scope of FPA section 4(e), specifically it required the licensee to undertake trout habitat restoration measures in tributary streams that are neither on the reservation nor within the project boundary. All of Interior's conditions were reprinted in Appendix A to the 2005 License Order, and ordering paragraph (D) of the 2005 License

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<sup>13</sup> 33 U.S.C. § 1341(a)(1).

Order includes them as mandatory FPA section 4(e) conditions, to the extent that those conditions apply to reservation lands or waters within the project boundary.

Following license issuance, Interior filed a revised 4(e) condition 6 on April 9, 2009. Revised condition 6 required the licensee to develop and implement the THRP and described specific financial obligations required of the licensee. Under the THRP, the licensee is required to restore and maintain the physical parameters of 164 miles of tributary habitat in several prioritized watersheds (or watersheds within the project area) within 25 years by implementing restoration projects and conducting monitoring to determine the success of restoration activities. As revised, success of the restoration activities would be determined based on the measurable parameters of properly functioning stream reaches, rather than by fish density criteria. Further, revised condition 6 established a Technical Committee, consisting of the licensee, BIA, FWS, Forest Service, Washington DFW, and the Tribe, which directs and oversees tributary restoration efforts. Interior's revised 4(e) condition 6 was made a condition of the license by ordering paragraph (B) of the 2010 Settlement Order and included in Appendix A to the same order.

Since implementation of the 2010 Settlement Order, Interior filed a revised 4(e) condition 6 by letter dated June 10, 2019, which is the subject of this EA. As revised, Condition 6 modifies the THRP by requiring the development of a Comprehensive Plan, through which the licensee would work with other stakeholders in the Pend Oreille River basin to develop goals for habitat restoration, prioritize restoration areas, and establish how goals will be achieved. The Comprehensive Plan would: describe the comprehensive goals for restoration of 164 miles of tributary habitat to aid in the recovery and conservation of the target species; prioritize restoration areas; articulate how the goals would be achieved; and include a monitoring program to ensure that goals are being met. Further, the Comprehensive Plan required under revised Condition 6 would facilitate future planning and project proposal development and may facilitate various regulatory approval processes by allowing programmatic review and approval of restoration efforts. Overall, the revisions to the THRP are primarily intended to better reflect the actual practice and future preferences of the Technical Committee, developed over 13 years' cooperative experience, and do not materially change the substantive goals and conditions of the program.

### 3.3.3 Section 18 Fishway Prescriptions

Section 18 of the FPA, 16 U.S.C. §811, states that the Commission is to require construction, operation, and maintenance by a licensee of such fishways as may be prescribed by the Secretaries of Commerce or the Interior. Interior provided preliminary fishway prescriptions by letter dated November 5, 2001 in response to the Commission's September 4, 2001, Ready for Environmental Analysis Notice for the relicensing of the Box Canyon Project, and provided modified section 18 prescriptions by letter dated May

21, 2004. These prescriptions were made conditions of the license by ordering paragraph (F) of the 2005 license order, and were attached in Appendix C of the license.

Interior's original fishway prescription includes measures for upstream and downstream passage of the target species at BCD and CCPP. It used a phased approach for upstream fish passage at BCD (i.e., temporary, interim, and permanent stages of passage facilities). For downstream passage, Interior prescribed an interim downstream fish passage facility at BCD, to be replaced by a permanent one if a specified effectiveness target is not met. At the CCPP, the prescription required the licensee to install and operate an interim trap-and-haul upstream fish passage facility, to be replaced later by a permanent upstream facility if notified by Interior, and to install and operate a permanent downstream fish passage facility. The prescription also included monitoring and effectiveness plans and studies.

Following license issuance, Interior revised its section 18 fishway prescriptions by letter provided April 9, 2009. The revised prescriptions were made conditions of the license by ordering paragraph (D) of the 2010 Settlement Order and were attached as Appendix C to the same order. The revised prescription eliminated the multi-phase approach, and instead provided a schedule for beginning conceptual design investigations and facility operation. Initially, the licensee was required to provide downstream fish passage at BCD before providing upstream passage, however, in order to help facilitate system connectivity for any fish that pass downstream via the spillways or turbines, the Commission approved a revised schedule which required upstream passage at BCD first.<sup>14</sup> The requirements to provide downstream passage at BCD were predicated on the assumption that passage through the spillways and turbines during downstream migrations represented a significant impact to the continued survival of those populations, however, the turbine and spillway injury and mortality study conducted at BCD in compliance with the fishway prescription suggests that the impacts of the spillways and turbines may not be as significant as originally believed (Normandeau 2012).

The section 18 fishway prescription for the CCPP established operational dates for the upstream and downstream fish passage 12.5 years and 12 years after the 2005 license issuance, respectively. Since the habitat conditions in the Calispell watershed were poor and there were no bull trout populations occupying the Calispell watershed, the protracted schedule for completing passage at the CCPP allowed time for development and implementation of habitat restoration activities as described in Interior's THRP in Calispell Creek.

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<sup>14</sup> *Pub. Util. Dist. No. 1 of Pend Oreille Cnty., Washington*, 137 FERC ¶ 62,010 (2011).

The upstream trap and haul fishway at BCD is currently under construction,<sup>15</sup> with operations expected in October 2021. The operational startup for downstream fish passage facilities at BCD has been delayed until July 2023, while the operational date for the upstream and downstream fish passage at the CCPP has been extended to January 2023 and July 2022, respectively.

Based on information obtained during the downstream fish passage study at BCD (Normandeau 2012) and during Interior's development of its Bull Trout Recovery Plan (FWS 2015a), Interior has concluded that, at present, downstream passage is not as high of a priority as other unfunded, high priority conservation actions needed throughout the Lower Pend Oreille River basin. Therefore, Interior filed revised its section 18 fishway prescriptions by letter provided June 10, 2019, which are the subject of this EA. The revised section 18 fishway prescriptions remove language requiring construction of downstream fish passage at BCD and up- and downstream passage at CCPP for the remainder of the license term (the license expires in 2055). The revised fishway prescription will require monitoring studies that will enable analysis of population trends for the target fish species, and would use that information to inform whether development of downstream passage facilities is warranted. The revisions require the licensee to undertake a monitoring program to determine impacts to target species populations from downstream passage through the turbines and spillways at BCD, and to file reports of the results with the Secretary of Interior no less than every 5 years. If there are sufficient negative effects on population levels of the target species, the licensee would be required to coordinate the scope of downstream fish passage measures with the level of project effects on the target species that cannot be offset through other appropriate means. Further, Interior may determine, no sooner than 2045, that a downstream passage facility at BCD is warranted, and if that determination is made the licensee would be required to develop 60 percent design plans for downstream passage to be included in its next license application.

### 3.3.4 Endangered Species Act

Section 7 of the Endangered Species Act (ESA) requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of federally-listed threatened or endangered species or result in the destruction or adverse modification of the critical habitat of such species.<sup>16</sup> Federally listed bull trout (*Salvelinus confluentus*), grizzly bear (*Ursus arctos horribilis*), and Canada lynx (*Lynx canadensis*) are species that may occur in the vicinity, but only bull trout, which are listed as threatened, occur within

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<sup>15</sup> The Commission's Division of Dam Safety and Inspections, Portland Regional Office, authorized construction for the upstream fishway on November 29, 2016.

<sup>16</sup> 16 U.S.C. § 1536.

the action area. The proposed action occurs in the Lake Pend Oreille (LPO) Core Area<sup>17</sup> of the Columbia Headwaters Recovery Unit for bull trout (FWS 2015a, 2015b), more specifically in the reach of the Lower Pend Oreille River downstream of Albeni Falls Dam to Boundary Dam, identified as LPO-C. Further, the activities are within the Clark Fork Critical Habitat Unit (CHU), and eight of the nine habitat components that are essential for the conservation of bull trout (physical and biological features, or PBFs) are found within the action area.

By letter issued January 30, 2020, Commission staff requested formal consultation with the FWS under section 7 of the ESA for the proposed amendment of mandatory conditions at the Box Canyon Project and provided the FWS with its Biological Assessment (BA). As discussed in *Section 4.5.2 Threatened and Endangered Species*, we concluded in our BA that amendment of the license to include revised mandatory conditions may affect, and is likely to adversely affect, bull trout and bull trout critical habitat. However, the implementation of restoration activities under the revised 4(e) condition 6 and activities under the 2019 Settlement and OLSA would result in improved conditions for bull trout in the LPO Core Area and improved habitat conditions within the Clark Fork CHU. Additionally, the BA determined that amendment of the license is not likely to adversely affect Canada lynx, grizzly bear, or grey wolf.<sup>18</sup>

On July 31, 2020, the FWS issued its Biological Opinion (2020 Opinion) for the Box Canyon Project, supplemented on August 28, 2020 with a revised table describing the take authorizations.<sup>19</sup> In the 2020 Opinion, including an Incidental Take Statement (ITS), the FWS determined that while some negative impacts from ongoing operations of the project are expected from downstream passage or entrainment, injury and mortality from research activities and the continued lost habitat access in Calispell Creek, the combined benefits of the proposed action (amendment of the license to include revised 4(e) conditions and Section 18 fishway prescriptions), implementation of the OLSA and the 2019 Settlement, and upcoming completion of upstream passage at BCD will result in improved conditions for bull trout across the entire LPO Core Area and habitat conditions

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<sup>17</sup> A core area is defined as a geographic area occupied by one or more local bull trout populations that overlap in their use of rearing, foraging, migratory, and overwintering habitat. Core areas are functionally similar to bull trout metapopulations in that bull trout within a core area are much more likely to interact, both spatially and temporally, than are bull trout from separate core areas.

<sup>18</sup> Since filing of the application, grey wolves have been delisted due to recovery (FWS 2020c).

<sup>19</sup> Biological Opinion, filed on Aug. 6, 2020; Supplemental Biological Opinion, filed on Aug. 31, 2020.

within the critical habitat unit, and will likely improve survival and recovery of bull trout within the Columbia Headwaters Recovery Unit. FWS concluded that the action, as proposed, is not likely to jeopardize the continued existence of the bull trout or is not likely to destroy or adversely modify designated bull trout critical habitat. The reasonable and prudent measures included in the ITS are requirements for monitoring and reporting. The terms and conditions, which implement the reasonable and prudent measures, require that if the authorized level of incidental take is exceeded during the course of the action, the Commission must immediately provide an explanation of the causes of the taking and review with the FWS the need for possible modification of the reasonable and prudent measures. Further, the FWS must be notified within three working days of discovery of a dead, injured or sick bull trout.

FWS also included two conservation recommendations in the 2020 Opinion. Conservation recommendations are discretionary agency activities<sup>20</sup> designed to minimize or avoid effects to listed species or critical habitat, to help implement recovery plans, or to develop information. FWS's conservation recommendations include: (1) implementation of collaborative efforts to address removal and long-term management of non-native predatory species (i.e. northern pike, walleye, smallmouth bass, and others) in the mainstem Pend Oreille River, and (2) participation in and/or funding for efforts to implement bull trout reintroduction or supplementation into the Pend Oreille River and its tributaries downstream of Albeni Falls Dam, upon completion of the upstream passage facilities at BCD and Albeni Falls Dam.

The potential effects to threatened and endangered species that may occur within the vicinity of the project area are described and discussed further in *Section 4.5 Threatened and Endangered Species*.

### 3.3.5 National Historic Preservation Act

Section 106 of the National Historic Preservation Act (NHPA)<sup>21</sup> and its implementing regulations<sup>22</sup> requires that the Commission take into account the effects of its actions on historic properties and afford the Advisory Council on Historic Preservation

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<sup>20</sup> 50 C.F.R. § 402.14(j) (2020) (“Conservation recommendations are advisory and are not intended to carry any binding legal force.”).

<sup>21</sup> 54 U.S.C. §§ 306108 et seq. The National Historic Preservation Act was recodified in Title 54 in December 2014.

<sup>22</sup> 36 C.F.R. 800.5(a)(2)(vii).

(Advisory Council) a reasonable opportunity to comment on the undertaking.<sup>23</sup> Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and culture that are listed or are eligible for listing in the National Register of Historic Places (National Register). In this document, we also use the term “cultural resources” for properties that have not been evaluated for eligibility for listing on the National Register. Cultural resources represent things, structures, places, or archaeological sites that can be either prehistoric or historic in origin. In most cases, cultural resources less than 50 years old are not considered historic. Section 106 also requires that the Commission seek concurrence with the state historic preservation office (SHPO) on any finding involving effects or no effects on historic properties, and consult with interested Indian tribes or Native Hawaiian organizations that attach religious or cultural significance to historic properties that may be affected by an undertaking.

To meet the requirements of section 106, the Commission executed a Programmatic Agreement (PA) with the Washington SHPO and Idaho SHPO for the protection of historic properties from the continued operation of the Box Canyon Project. The Tribe, the Colville National Forest and the licensee are concurring parties. The terms of the PA ensures that the applicant addresses the protection of all historic properties identified within the project’s area of potential effect (APE) through development of a Historic Properties Management Plan (HPMP). Article 413 of the project’s license requires the licensee to implement the PA and file a HPMP within one year of license issuance. On April 9, 2008, the Commission approved the HPMP.<sup>24</sup>

Cultural resource protection is discussed further in *Section 4.6, Cultural Resources*.

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<sup>23</sup> An undertaking means “a project, activity, or program funded in whole or in part under the direct or indirect jurisdiction of a Federal agency, including those carried out by or on behalf of a Federal agency; those carried out with Federal financial assistance; and those requiring a Federal permit, license, or approval.” 36 C.F.R. § 800.16(y). Here, the undertaking is the potential amendment of fish passage requirements and incorporation of 2019 Settlement, revised 4(e) condition, and revised section 18 fishway prescriptions into the Box Canyon Project license.

<sup>24</sup> *Pub. Util. Dist. No. 1 of Pend Oreille Cnty.*, 123 FERC ¶ 62,029 (2008).

## 4.0 ENVIRONMENTAL ANALYSIS<sup>25</sup>

In this section, we present our analysis of the proposed action and environmental measures contained in the 2020 Opinion. Sections are organized by resource area. Under each resource area, we first describe the current conditions. The existing condition is the baseline against which the environmental effects of the proposed action are compared, including an assessment of the effects of proposed mitigation, protection, and enhancement measures, and any potential cumulative effects. Our conclusions and recommended measures are discussed in Section 5.0, *Conclusions and Recommendations* of the EA.

The proposed action has the potential to affect water quality, aquatic resources, threatened and endangered species, and cultural resources. Detailed descriptions of these resources are provided in the licensee's various license compliance reports and in material prepared during the relicensing proceedings in the early 2000s. The following sections summarize the affected environment for these resource areas and the reader is referred to previous filings for additional background information, if necessary. Resources that would not be affected by the proposed action and are therefore not evaluated further include: geology and soils; water quantity; terrestrial resources; land use and aesthetics; recreational resources; socioeconomics; traffic and transportation; air quality; and noise.

### 4.1 General Description of The River Basin

The Box Canyon Project is located on the Pend Oreille River in northeastern Washington State (Figure 1). The dam and powerhouse are located near Ione in Pend Oreille County, Washington. The BCR extends 55.7 miles up the river to Albeni Falls Dam in Bonner County, Idaho. The upstream drainage area for the BCR is 24,930 square miles. There are 22 streams emptying into the BCR; Calispell and LeClerc creeks are the largest. The Pend Oreille River is the second largest river in Washington State.

Land use in the project area is mostly rural with large areas of forest, mountains, valleys, and open pastures with widely dispersed homes and ranches. Development consists largely of timber harvesting, grazing, mining, heavy industry, urban and rural residential development, and recreation. Other characteristics of the Pend Oreille River basin, including land use and development, socioeconomics, population centers, and

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<sup>25</sup> Unless otherwise indicated, our information is taken from the licensee's June 10, 2019 filing. We also reviewed Commission staff's final Environmental Impact Statement (EIS) issued on October 21, 2004, which analyzed the effects of licensing the project as proposed by the licensee in its January 21, 2000, application.

transportation routes are described in previous filings and issuances (see the licensee's Final License Application<sup>26</sup> and Shoreline Management Plan,<sup>27</sup> or FERC 2004).

## 4.2 Geographic and Temporal Scope

The geographic scope of this analysis is defined by physical limits or boundaries of: (1) the proposed action's effect on the resources, and (2) contributing effects from other hydropower and non-hydropower activities within the Pend Oreille River basin. Our overall scope of analysis encompasses the project boundary (the main stem of the Pend Oreille River and adjacent lands from the BCD upstream to Albeni Falls dam) and downstream to Boundary dam. This reach of the Pend Oreille River encompasses the entire project facility, plus those river reaches and other facilities on the river that affect or are affected by project operation. Due to the proposed actions in tributary habitats, we include major tributaries to the BCR. The temporal scope of this analysis is focused on the period 2004 through 2045, i.e., the term of the Box Canyon Project license, and concentrates on the effect on the resources from reasonably foreseeable future actions.

## 4.3 Water Quality

### 4.3.1 Affected Environment

Water quality management for the Box Canyon Project is complex because the project crosses the Idaho-Washington border and a portion of the reservoir is within the KIR. The Idaho Administrative Code (IDAPA 58.01.02 Water Quality Standards) designates the Pend Oreille River from Albeni Falls dam to the Idaho-Washington border for several beneficial uses including coldwater communities, primary contact recreation, and domestic water supply. The Washington Administrative Code (WAC 173-201A Water Quality Standards for Surface Waters of the State of Washington) designates beneficial uses for Pend Oreille River, including char (bull trout and Dolly Varden) spawning and rearing, primary contact recreation, water supply uses (e.g., domestic, industrial, agricultural) and miscellaneous uses (e.g., wildlife habitat, recreation, aesthetics). The Tribe's water quality standards designates beneficial uses of adult salmonid migration, primary contact recreation, agricultural water supply, wildlife habitat and hunting, ceremonial and cultural use, and aesthetic quality for surface waters of the Pend Oreille River, Calispell Creek, and Cee Cee Ah Creek within the KIR. In addition, the Tribe designates the beneficial use of brown trout spawning for Cee Cee Ah Creek. Tables 2, 3, and 4 of the project's 2004 licensing Environmental Impact Statement (EIS)

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<sup>26</sup> Final License Application, filed on Jan. 21, 2000.

<sup>27</sup> *Pub. Util. Dist. No. 1 of Pend Oreille Cnty.*, 149 FERC ¶ 62,009 (2014).

summarize the water quality standards from Idaho DEQ, Washington DOE, and Tribe (FERC 2004 at 41-45).

The 2004 EIS provides a thorough description of water quality concerns in the project area, including the effects of project operations at the time of relicensing and proposed project operations and license conditions on water temperature, dissolved oxygen (DO), pH, total dissolved gas (TDG), and nuisance aquatic plants in the BCR, Calispell Creek, and downstream of the project (FERC 2004 at 40-84). Here, we supplement the description of water quality issues discussed in the EIS with updated information from the water quality monitoring programs to describe the current condition.

The 2005 License Order requires compliance with the conditions of the WQCs issued by Washington DOE and EPA, which includes but is not limited to, requirements for the licensee to monitor water temperature and other water quality parameters, develop a dissolved gas management program, and implement abatement measures to bring TDG into compliance with water quality standards. The licensee has implemented water quality plans designed to provide methods for long-term water quality monitoring and reporting, track progress toward meeting and remaining in compliance with the relevant water quality standards, and respond to adaptive management goals.<sup>28</sup> The licensee files annual water quality monitoring reports<sup>29</sup> summarizing temperature, DO, pH, and TDG data, as monitored at 4 locations on the Pend Oreille River (BCD forebay and tailrace, mid-reservoir at the bridge at Usk, and in the tailrace of Albeni Falls Dam<sup>30</sup>). Since issuance of the 2005 License Order, Washington DOE has prepared a Total Maximum Daily Load (TMDL) Water Quality Improvement Report for the Pend Oreille River for water temperature (Baldwin et al 2011) and for TDG (Pickett and Jones 2007) to address the exceedances from the Washington State water quality standards, identify how much pollution needs to be reduced or eliminated to achieve applicable water quality standards,

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<sup>28</sup> *Pub. Util. Dist. No. 1 of Pend Oreille Cnty.*, 115 FERC ¶ 62,161 (2006); *Pub. Util. Dist. No. 1 of Pend Oreille Cnty.*, 115 FERC ¶ 62,159 (2006).

<sup>29</sup> Included in the Resource Coordination Implementation and Monitoring Plan annual reports which detail compliance with various Forest Service 4(e) conditions and Interior 4(e) conditions. *Pub. Util. Dist. No. 1 of Pend Oreille Cnty.*, 144 FERC ¶ 62,256 (2013); *Pub. Util. Dist. No. 1 of Pend Oreille Cnty.*, 146 FERC ¶ 62,002 (2014).

<sup>30</sup> This monitoring site was previously at Kelly Island (at RM 88) and was changed in 2015 to a location roughly 500 ft below Albeni Falls Dam. pH is not monitored at the Albeni Falls tailrace site.

and establish a strategy to achieve compliance. The temperature TMDL is not yet finalized and approved by EPA; the TDG TMDL was approved by the EPA in 2008.

The licensee’s water quality monitoring indicates that summer water temperatures exceeding the Washington State water quality standard<sup>31</sup> of 20°C commonly occur between late July and September (Table 1), and that temperatures in the river and tailrace exceeding 24°C can occur for multiple days in August. Temperature differences between the forebay and the tailrace monitoring stations tends to be less than 0.5°C.

**Table 1. Mean summer water temperatures (°C) in the tailrace of Box Canyon Dam between 2008 and 2019 (adapted from the licensee’s Implementation and Monitoring Plan annual reports and FWS 2015).**

Year	June	July	August	Sept
2008	13.7	20.9	20.6	17.8
2009	15.8	20.4	22.4	19.5
2010	14.3	19.6	22.2	16.8
2011	11.9	17.0	21.6	19.4
2012	12.4	19.9	22.8	18.9
2013	16.5	21.9	23.5	19.2
2014	15.0	20.7	22.9	18.6
2015	20.5	24.0	22.0	17.4
2016	17.3	20.9	22.4	18.1
2017	15.9	22.5	23.2	19.0
2018	16.1	20.8	22.7	17.9
2019	17.1	20.4	22.6	19.3

There is little opportunity for the licensee to dramatically lower summer water temperatures in the BCR through changes in project operations, since the project is operated as run-of-river and minimal vertical stratification occurs within the reservoir (FERC 2004 at 59). The BCR tributaries provide cool water thermal refugia for native

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<sup>31</sup> Temperature shall not exceed a 1-day maximum (1-DMax) of 20.0°C due to human activities, and when natural conditions exceed a 1-DMax of 20.0°C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3°C; nor shall such temperature increases, at any time, exceed  $t = 34 / (T + 9)$  (where “t” = the allowable temperature increase, and “T” represents the background temperature as measured at a point, or points, unaffected by the discharge and representative of the highest ambient water temperature in the vicinity of the discharge).

salmonids when summer temperatures are inhospitable, typically from July through September. The licensee is participating in the temperature TMDL process being conducted by Washington DOE for the Pend Oreille River, even though the TMDL is not yet finalized and approved by EPA, and is proceeding with water temperature improvement efforts already underway pursuant to the THRP, such as bank stability projects and efforts to increase shoreline and tributary shading. Following EPA approval of the temperature TMDL, a water quality implementation plan will be developed to identify specific tasks, responsible parties, and timelines to help reduce the water temperature, with the goal of meeting the state's water quality standards.

The licensee's annual water quality monitoring reports indicate that the Washington State water quality standard for DO (minimum concentration of 8 milligrams per liter (mg/l)) is generally met in the Pend Oreille River during the April through October monitoring season, with a seasonal downward trend in mid-summer due to increased water temperatures. Absolute DO levels (mg/l) tend to be somewhat lower in July, August, and September even though DO saturation tends to remain roughly around 100%. The high abundance of aquatic plant growth in BCR results in higher DO levels than the relatively warm water temperatures might imply. DO concentration tends to drop below 8 mg/l as water temperatures approach 22°C (depending on atmospheric pressure), even at 100 percent saturation. There is little the licensee can change operationally to affect DO concentrations (FERC 2004 at 59). The licensee is therefore addressing DO compliance through consideration of water temperatures, including the temperature TMDL process and water temperature improvement efforts as described above. Additionally, the 2005 License Order required implementation of an Integrated Aquatic Plant Management Plan,<sup>32</sup> in part because Commission staff concluded that management of aquatic vegetation could possibly improve DO concentrations near the water-substrate interface of some sloughs (FERC 2004 at 59) where decomposition of organic matter (i.e., mostly aquatic vegetation) and limited mixing caused by aquatic vegetation could be causing lower DO concentrations. Where aquatic weeds constitute a nuisance, the licensee manages aquatic weeds through harvesting and roto-ovation.

Water quality monitoring reports indicate pH exceeding the upper allowable limit of 8.5 units during June through September, with relatively infrequent exceedances in June and July and more frequent exceedances in August and September, consistent with trends described in the 2004 EIS (FERC 2004 at 61-62). The highest pH levels in the summer are likely a result of considerable aquatic macrophyte growth. Commission staff concluded in the 2004 EIS that management of aquatic vegetation to reduce plant densities could potentially reduce pH in localized areas, but would not substantially lower

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<sup>32</sup> *Pub. Util. Dist. No. 1 of Pend Oreille Cnty.*, 120 FERC ¶ 62,175 (2007).

pH levels in the BCR's main channel. The licensee manages aquatic vegetation through its Aquatic Plant Management Plan.

During the spring when spill occurs at upstream dams, TDG levels exceed the Washington State water quality standard for TDG, designated as a maximum of 110 percent of saturation.<sup>33</sup> TDG supersaturation entering the BCR can persist through the project and pass on downstream through the Boundary Hydroelectric Project and subsequent Canadian hydro projects. The TDG criterion is exceeded below the BCD when water spills over the top of the spillway gates and air is subsequently entrained. The 2004 EIS analyzed reasonable ways of limiting the effects of the project on TDG below the project (summarized in Table 7 of FERC 2004), and the licensee has since completed turbine upgrades and installation of the auxiliary spillway bypass gates pursuant to the Total Dissolved Gas Abatement Plan.<sup>34</sup> The turbine upgrades increase generator capacity at the dam, thereby reducing the spill necessary at those times when spill increases TDG levels the most, and the spill gate lift modifications allow gates to be lifted from lower in the water column, such that spill is converted from a plunging effect to a skimming effect (more horizontal flow) and therefore reducing TDG entrainment.

The licensee's 2006 TDG study indicated the presence of strong lateral TDG gradients during periods of spill at BCD due to the difference in TDG levels between powerhouse flow and spill flow and that complete mixing of the turbine and spill flows did not occur until approximately 5 miles downstream of BCD (EES 2007). The licensee completed a TDG matrix study in 2019 to test various spill gate configurations to determine the effects on TDG levels and distribution patterns downstream of BCD and to compare the TDG levels and distribution patterns to those that existed prior to the licensee's turbine upgrades and spill gate lift modifications to reduce TDG entrainment. The licensee has determined the optimal spill gate configuration to minimize increases in TDG saturation, and the results of the TDG matrix study indicated that the new spill gate configuration demonstrated approximately 4-5 percent increase in TDG saturation for every 10,000 cfs of spill. This is less than half of the approximately 10-12 percent increase in TDG saturation for every 10,000 cfs of spill reported during the 2006 study and in annual TDG monitoring reports from 2008 to 2015, suggesting that TDG increases in spill flow may be substantially reduced with the recently completed TDG reduction efforts (PUD 2019a, PUD 2021). The licensee's implementation of the TDG abatement plan provides a schedule and strategy for achieving compliance with the TDG standard;

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<sup>33</sup> This criterion does not apply to flows when the stream flow exceeds the 7-day, 10-year frequency flood flow.

<sup>34</sup> *Pub. Util. Dist. No. 1 of Pend Oreille Cnty.*, 115 FERC ¶ 62,163 (2006); *Pub. Util. Dist. No. 1 of Pend Oreille Cnty.*, 139 FERC ¶ 62,266 (2012).

adaptive management will be implemented if water quality monitoring shows that the TMDL targets are not being met (Pickett and Jones 2007 at 49, 51).

Commission staff found little additional information available to describe the current water quality conditions in Calispell Creek to supplement information in the 2004 EIS. The licensee's approved water quality monitoring plans do not include monitoring of Calispell Creek water quality, although Kalispel Natural Resource Department (KNRD) monitors temperature, DO, pH, and other water quality parameters on multiple tributaries to the Pend Oreille River.<sup>35</sup> A court case pertaining to the EPA's WQC for Calispell Creek has been stayed since 2007, pending potential settlement by the licensee, EPA, and the Tribe. Calispell Creek is not addressed by the temperature TMDL for the Pend Oreille River because a temperature model specifically for Calispell Creek is being developed separately, and that information will be used to either develop a TMDL or perform actions to improve temperatures in the future (Baldwin et al 2011).

As described in the 2004 EIS, DO concentrations in Calispell Creek are likely depressed by the reduced reaeration rate, caused by slower velocities, and decomposition of organic matter in the reach (2004 EIS at 60). Additionally, water temperatures downstream of Calispell Lake reach high levels during much of the year, and at the lake outflow and Calispell pumps temperatures can exceed 20.0° C during summer months (2004 EIS at 49). High temperatures in Calispell Creek may persist into the fall (October and November; Davenport 2018). Ongoing activities to restore riparian habitat in Calispell Creek can improve water quality conditions by preventing summer warming and providing future cool-water refugia. To date, the licensee implemented trout habitat restoration activities in 5.9 miles of the lower North Fork Calispell Creek and 9.4 miles of the Middle Fork Calispell Creek (PUD 2021). Currently, operational parameters for the CCPP in Plan E (set forth in Appendix F to the 2005 License Order), do not maintain continuous flow, therefore flow is sometimes substantially slower through the reach than would occur naturally. The operations at CCPP can therefore affect water temperature and other water quality parameters within the creek, as well as water discharged from the pumps into BCR.

#### 4.3.2 Environmental Effects

The proposed amendment will not alter project operations. The effects to water temperatures from the ongoing operation of the BCD will remain the same, and elevated TDG levels in the Pend Oreille River during the spring when spill occurs at upstream dams will not be reduced by this amendment. The licensee's continued implementation of the required water quality plans will provide monitoring and reporting on compliance with the water quality standards, as described in the revised TDG Abatement Plan, the Interim Temperature Management Plan, and the Water Quality Monitoring Plan. The

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<sup>35</sup> Kalispel Natural Resources Department, *Our Water*, <https://knrd.org/our-water/> (last visited June 15, 2021).

licensee will also continue management of invasive plant infestations pursuant to its approved Aquatic Plant Management Plan, which is expected to benefit localized DO and pH conditions. Further, other ongoing or proposed activities in the Pend Oreille River are expected to benefit water quality conditions, including but not limited to: Temperature TMDL; TDG TMDL; water quality monitoring (conducted by KNRD); bank stabilization (conducted by KNRD); and riparian fencing and planting (conducted by Washington DFW).

*Revised 4(e) Condition 6, Trout Habitat Restoration Program*

Implementation of FWS's revised THRP will ensure continuation of the focused restoration efforts already underway under the existing 4(e) condition 6. The proposed actions are not likely to measurably change or modify temperatures within the BCR due to existing river volumes, but some of the THRP measures, such as instream and riparian restoration and maintenance activities and purchase of land or conservation easements, will improve water temperatures and water quality in the tributaries to the reservoir (described in more detail in *Section 4.4.1, Aquatic Resources*). Specifically, through restoration and maintenance of riparian areas and land use control (i.e., installation of fencing to exclude livestock grazing and purchasing high-quality habitat areas on private and public land areas) the licensee will be able to maintain and conserve riparian areas and minimize stream bank erosion. Vegetation associated with the riparian zone provides shade which will keep water temperatures significantly cooler than areas in direct sunlight (FERC 2004 at 116), and provides an established root structure at the water's edge, slowing erosion and maintaining the integrity of the bank (EES 2006). Channel improvements, such as barrier removal and geomorphologic improvements (including placement of instream structures) will benefit water temperatures by increasing stream roughness and stream depth, which will provide instream shading, and stabilize stream banks to allow natural riparian revegetation. Many of the native salmonid habitat restoration measures implemented under this program are focused on reducing stream temperatures and increasing, maintaining, or stabilizing instream flows which provide cool water input to the mainstem throughout the year (PUD 2019b). Any temporary, short-term effects from in-stream and land-based restoration activities will not compromise the benefits of restoration. The tributary habitat restoration measures will contribute toward maintenance or enhancement of water quality and quantity conditions in the project area, and will result in a substantial improvement to existing aquatic conditions in the BCR tributaries (FERC 2004 at 174).

The administrative changes in revised condition 6 will modify specific planning, project development, and approval measures of the THRP in order to reflect specific direction of the Box Canyon Dam Resource Technical Committee, but will not have any direct effect to water quality conditions. The revised THRP requires the licensee to develop a Comprehensive Plan for stream restoration projects in Pend Oreille County. The Comprehensive Plan will enable: coordination between stakeholders for ongoing

restoration activities already underway; incorporation of other relevant plans developed for the Project area; identification of restoration goals; and prioritization of sites for restoration. Further, the Comprehensive Plan includes a monitoring program to ensure goals are being met. The Comprehensive Plan will indirectly improve water quality conditions in the tributary reaches by improving coordination and implementation of the restoration efforts.

#### *Revised Section 18 Fishway Prescription*

The revised section 18 will not alter water quality in the project area, as there will be no change from the current condition. Revised section 18 prescriptions eliminate the potential for construction-related effects to water quality that would be expected if the licensee was required to construct downstream passage facilities at BCD and up-and-downstream passage facilities CCPP. The revised section 18 prescription requires that the interim design plans for downstream fish passage (subsection 1.3.2 of the revised prescription), which may be developed as part of the pre-application consultation process for any future project license (other than an annual license) after expiration of the current license, are to ensure that the design and operation of the facility shall be consistent with any applicable water quality regulations for periods when the Pend Oreille River exceeds water quality criteria for temperature and TDG. The specific details of the interim downstream fish passage plan will potentially be developed in the future and therefore cannot be analyzed in this EA. In general, Commission staff expect that including considerations for water quality compliance in the interim design plan will help protect water quality and prevent operation of the facility from exacerbating water quality exceedances.

#### *Off-License Settlement Agreement*

The OLSA, which includes measures outside of the Commission's jurisdiction, will resolve long-standing issues with regard to water quality in Calispell Creek. The off-license Watershed Program and Conservation Program (to be established by the Tribe, with funding from the licensee) both include measures for water temperature abatement (the Conservation Program prioritizes projects that are most likely to yield water temperature benefits as measured within the Project boundary). Additionally, the OLSA will allow resolution between the licensee and Tribe regarding issues related to the licensee's compliance with State, Federal, and Tribal water quality laws and regulations. This will occur through the aforementioned Watershed Program and Conservation Program, and through future commitments from the Tribe and licensee<sup>36</sup> which are intended, in part, to ensure finalization of Washington DOE's 2011 Temperature TMDL

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<sup>36</sup> Pending Commission approval of the 2019 Settlement.

and to provide for revised operation of the CCPP to reduce water temperature in Calispell Creek.

Commission staff expect that execution of the OLSA will result in additional specific information regarding the temperature TMDL and revised operation of the CCPP, however, these measures are dependent on future decisions of other parties (the Tribe and licensee as signatories to the OLSA; the EPA's approval of the TMDL) and future submittals to the Commission (the revised operation of the CCPP<sup>37</sup>), and therefore cannot be analyzed in this EA. In general, the activities included in the OLSA will advance programs which are designed to benefit water quality in the project area, as well as promote those administrative actions necessary to ensure the licensee's compliance with State, Federal, and Tribal water quality laws and regulations, and will therefore have a beneficial effect on water quality conditions in the project area.

#### 4.4 Aquatic Resources

##### 4.4.1 Affected Environment

The BCR supports a variety of native and non-native fish. Native species include bull trout (federally listed as threatened), westslope cutthroat trout, mountain whitefish, northern pikeminnow, pygmy whitefish, peamouth, redbside shiner, sculpin (various species), burbot, largescale sucker, and longnose sucker. Non-native or introduced fish species include brook trout, lake trout, rainbow trout, brown trout, kokanee, northern pike, brown bullhead, bass, yellow perch and sunfish. Fishery resources, including life history, aquatic habitat preferences, and fishery management within the project area are described in the 2004 EIS (FERC 2004 at 86-98; FERC 2004 tables 8 and 9). The affected environment remains largely the same for the purposes of this EA, as supplemented here with current information from the implementation of the license conditions and off-license measures.

The tributary habitats in the project area serve as important summer thermal refuge for resident coldwater fish species (i.e., native and non-native salmonids) due to the limited amount of coldwater habitat in BCR, and provide essential habitat for salmonid spawning and rearing (FERC 2004 at 46, 86, 88). Restoration of the tributary habitats is critical for re-establishing native salmonid populations in tributaries to the BCR, and the THRP includes an array of measures designed to improve water quality, habitat complexity, and habitat connectivity in several project area tributaries.

Under the existing THRP, the licensee has conducted general surveys (to identify potential restoration and reference sites, and to prioritize implementation of restoration measures) and targeted surveys (necessary for developing, monitoring, and demonstrating the success of specific restoration measures) in specific tributaries. The licensee has

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<sup>37</sup> Revised operation of the CCPP is not under review in this EA.

completed habitat restoration projects in a total of 64.3 miles of tributary between 2009-2019, which includes exotic species control or eradication, monitoring, and instream habitat projects such as large wood placement, riparian plantings, and various land management strategies (PUD 2021). Table 2 describes the restoration measures included in the THRP and the habitat benefits; the locations and specific activities implemented are summarized in annual reports.<sup>38</sup>

**Table 2. Tributary restoration measures and benefits (adapted from PUD 2019b).**

Restoration Measure	Benefits
Channel improvements (limited to geomorphologic improvements and barrier removal)	Barrier removal will improve habitat connectivity.  Installation of instream structures (such as large woody debris or engineered log jams) will increase stream roughness and stream depth, which will slow water velocity and increase ground water recharge. Installed features will improve fisheries habitat by providing instream cover/shading. Stabilized stream banks will promote natural riparian revegetation and improve canopy cover.
Floodplain restoration	Floodplain restoration will increase canopy/instream cover and improves ground water transfer, which will slow seasonal runoff events which can increase late summer cold water sources in the mainstem.
Riparian corridor restoration	Stream banks that are degraded by historic erosion events, logging, over-grazing, or developed properties will be stabilized with plantings, which will reduce water temperature directly through shading or indirectly by reducing erosion/sedimentation.
Fencing	Installing fencing will reduce livestock grazing in riparian habitat, which will allow natural riparian vegetation recruitment and stream shading.
Conservation easements and/or purchases	Land purchases and/or conservation easements will protect sections of the tributaries currently in good condition, protect sensitive parcels from a land use change that could increase stream temperatures, and

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<sup>38</sup> See *supra* note 29.

Restoration Measure	Benefits
	provide access for other restoration measures listed here.
Non-native fish removal	Removal of non-native fish will improve survival and recruitment of native species due to reduced competition with and predation by non-native fish.
Reintroduction or supplementation of target species	Conservation aquaculture will increase target species spawning populations, increase the rate of rebuilding the naturally spawning population, increase the genetic effective population

Under the existing THRP, additional priority was placed on restoration measures in Calispell Creek to coincide with provision of fish passage at CCPP as required under Interior’s fishway conditions. Although substantial habitat restoration work and culvert removal has been completed in several portions of the Calispell Creek watershed (Forest Service 2015 at 37), historical degradation and ongoing water and land use practices continue to severely impact water quality and fish habitat, such that there is limited pool habitat, bank erosion, low channel complexity, low overhead canopy, and reduced recruitment of large woody debris (KNRD 2001 and DE&S 2001, as cited in Forest Service 2015). There are no passage facilities installed at CCPP, and the CCPP prevents access to approximately 21 miles of natural barrier-free habitat within Calispell Creek and tributary streams (FERC 2020 at p. 63).

Since issuance of the 2005 License Order, various measures have been taken to control non-native fish populations in the project area. In the Pend Oreille watershed, 64 percent of the fish assemblage is composed of non-native species, which adversely affect native fish species through predation, direct and indirect competition, and hybridization (KNRD 2017). Smallmouth bass are the most common non-native predators, comprising 12 percent of all fish sampled in the reservoir including tributaries and tributary deltas (SCL 2009). Northern pike, first detected in the BCR in 2004, quickly increased in population and threaten the survival of native salmonids due to a high degree of habitat overlap, especially when native salmonids seek thermal refuge within the littoral zones (Avista 2021). The Kalispel Tribe and Washington DFW have implemented measures which have resulted in a significant reduction of northern pike in BCR since 2012 (Avista 2021; KNRD & Washington DFW 2020). Additionally, competing non-native salmonid species include brook trout, brown trout, lake trout, and rainbow trout, both triploid and wild. Non-native predator removal projects have recently eliminated brook trout from the upper reaches of Cee Cee Ah Creek and Smallee Creek (Wingert and Anderson 2007; SCL 2017), with the potential for future efforts to result in the long-term reduction of brook trout throughout the drainages. Following successful removal of brook trout from

the upper reaches of these creeks, reintroduction of native westslope cutthroat trout is underway at Cee Cee Ah Creek and proposed at Smallee Creek (Walker et al 2019).

The lack of upstream fish passage at BCD prevents fish from moving upstream from Boundary Dam Reservoir into BCR to access approximately 55 miles of the Pend Oreille River and its tributaries for forage, spawning, over-wintering habitat, and cold water refugia. The upstream trap and haul facility at BCD is expected to be operational by October 2021. Once operating, the licensee will provide upstream fish passage for the three target species as required by the license; non-native fish (other than nuisance fish) and non-native salmonids would be passed downstream; and nuisance fish would not be passed upstream or returned downstream (brook trout would be placed in Campbell Pond for youth catch-and-keep fishing; walleye and northern pike would will be dispatched) (PUD 2014, Table 1). Operation of the upstream passage facility will provide connectivity for migratory species from the Boundary Dam to Albeni Falls Dam, and will allow management of nuisance species.

The license currently requires installation of a permanent downstream fishway at BCD, which must provide effective (safe and timely) downstream movement of target fish species  $\geq 10.0$  inches (250 mm) by a non-turbine route from the forebay to the tailrace, and must meet a 95 percent fish guidance efficiency, which means that 95 percent of the target fish species  $\geq 10$  inches in length must successfully pass through BCD without evidence of direct or delayed injury and/or mortality. In 2010 and 2011, the licensee conducted a study to determine the direct effects of downstream fish passage (survival and condition) on juvenile and adult triploid rainbow trout (*Oncorhynchus mykiss*, serving as a surrogate for naturally-occurring salmonids in the Pend Oreille River) passed through Spillbay 2, an existing turbine (Unit 2), and at a newly installed turbine (Unit 4). The study assessed survival at 1 and 48 hours post-treatment, and established a malady category to include fish with visible injuries, scale loss, or loss of equilibrium, and designated fish without maladies as passing downstream malady free. During the study, juvenile and adult fish were purposely directed towards areas of the spillway considered to be most detrimental to passed fish, so the survival and malady free estimates for fish passing through most of the spillway should be equivalent to or better than the estimates from the study (Normandeau 2012). Because the majority of injuries experienced by fish passing via spill were minor and not life-threatening, a major malady-free estimate was calculated in a separate analysis performed with fish exhibiting only major (life threatening) injuries.

The results of the study indicated that juvenile fish (150-250 mm/5.9-9.8 inches) passing at the BCD turbines had high survival and low injury when compared to other Kaplan turbines. Specifically, for juvenile fish the 48-hour survival estimates through all downstream passage routes were greater than 96.0 percent; malady-free passage estimates were  $\geq 96.0$  percent for passage through Unit 2 and Unit 4, and major malady-free passage estimates through the spillway were 98.3 percent (Normandeau 2012). The

results of the study also indicated that adult fish (300-600 mm/11.8-23.6 inches) released at the BCD's existing and new turbine showed similar survival rates and lower injury rates when compared to other Kaplan turbine studies of various species of adult fish. The 48-hour survival estimate for passage was 97.0 percent through the spillway, 83.8 percent through Unit 2, and 84.9 percent through Unit 4 (Normandeau 2012). The adult fish malady-free passage estimate was 79.4 percent for Unit 2 and 84.3 percent Unit 4, and the major malady-free passage estimate for spillway passage was 97.5 percent (Normandeau 2012).

Since completion of the study, the licensee has completed the turbine replacements at BCD. At the time of license issuance, the hydraulic capacity of the four existing turbines at BCD was about 27,500 cfs; under current operations with the new turbines, flows up to 32,000 cfs pass through the turbines, with flows in excess of 32,000 cfs passing over the spillway. Under present routine operation of the facility, the spill-gates are closed except during the highest flows, which generally occur in May and June (although some large rain-on-snow events have created flood conditions in the winter), therefore the spillway is operational approximately 2 months per year and routinely passes between 50 and 100 percent of peak flows during that time. With the spillway gates at BCD closed for longer duration, during most of the year all Pend Oreille River flow is diverted from the forebay of BCD into the turbines, resulting in the entrainment of all fish attempting to migrate downstream past the dam. Increasing the project's hydraulic capacity was previously identified as having the potential to increase the risk of entrainment at the project (FERC 2004 at 55). Recent downstream passage behavior studies at BCD indicate the ratio of turbine versus spillway passage events closely match the ratio of flow following those two paths at the time fish choose to move downstream (McMillen Jacobs 2017, as cited in FERC 2020). Based on current operations and conclusions from passage studies, when spill is occurring the injury and mortality rates are expected to be somewhere between 6 and 16 percent, depending on route of passage.

#### 4.4.2 Environmental Effects

##### *Revised 4(e) Condition 6, Trout Habitat Restoration Program*

Amending the license to include the revised THRP will ensure continuation of the tributary restoration measures described in Table 2 to improve instream and riparian habitat conditions already underway pursuant to the current THRP. There is no change to the types of restoration measures that will be enacted, and the goals of enhancing native trout populations through habitat restoration, enhancements, and supplementation are consistent with the current THRP. The proposed action will not alter the scope, on-the-ground actions, or program goals of the measures, therefore the restoration measures will continue to contribute toward maintenance or enhancement of complex stream channels (currently present only in some of the tributary portions of the action area) and thermal refugia, which will improve aquatic habitat for and benefit fishery resources in the project

area (FERC 2004 at 116, 121, 122, 174, 326). For the restoration measures under the revised THRP, continuing to implement habitat enhancements and suppressing or eradicating non-native fish from tributary reaches will facilitate the recovery of native fish populations if there is sufficient recruitment of native salmonids, and reintroducing or supplementing target species through conservation aquaculture will support a positive population response to biological and habitat improvements in the tributaries. The target watersheds will be assessed as necessary to select and prioritize restoration measures, and restoration projects will include a combination (some or all) of the measures described in Table 2. The revised THRP is a long-term plan which will continue efforts toward the 25-year restoration schedule for 164 miles of tributary habitat (that is, 25 years after the 2010 Settlement Order), therefore benefits from it are expected during implementation of the current license.

The revised THRP will modify the success criteria for the proposed restoration projects. Each proposed restoration project will identify measurable success criteria and monitoring methods to determine whether the objectives of the restoration project have been met. If monitoring determines that success is not achieved, the licensee will develop a remediation plan to correct the deficiencies. This revision will allow development of site- and project-specific success criteria and permit an adaptive approach to restoration activities to assess how program projects and measures are performing. The success criteria will still require monitoring of restoration projects and agreement from the Technical Committee that restoration objectives are met, therefore the revised success criteria are not expected to adversely affect aquatic resources.

The revised THRP will no longer specify the spending limitations that apply to the implementation of the tributary restoration measures. The removal of spending limitations from the revised THRP will not interfere with or prevent implementation of the measures specified in the THRP, and therefore will not adversely affect aquatic resources.

The revised THRP will modify the planning, project development, and approval process in order to reflect specific direction of the Technical Committee. The modified administration of the program will ensure the THRP will follow the best available science and maximize program benefits to aquatic habitats and fishery resources. The revised 4(e) THRP will also require the licensee to facilitate, in coordination with the Technical Committee, the development of a Comprehensive Plan for stream restoration projects in Pend Oreille County. The plan will describe the comprehensive goals for restoration of 164 stream miles of tributary habitat to aid in the recovery and conservation of target species, prioritize restoration areas, articulate how the goals will be achieved, and include a monitoring program to ensure that goals are being met. The Comprehensive Plan will benefit aquatic resources by providing an effective framework to facilitate future restoration planning, project proposal development, and various regulatory approval processes.

In comments filed June 28, 2019, Idaho DFG requested to be a member of the Technical Committee, since the 2019 Settlement does not include them as a member. Idaho DFG is currently a member of the Technical Committee because the 2010 Settlement Order granted Idaho DFG a full seat on the Technical Committee for issues relating to the Section 18 fishway prescriptions and 4(e) conditions which pertain to measures that will occur in Idaho or impact its fishery resources. The revised THRP and Section 18 fishway prescription will affect Idaho and the fishery resources Idaho DFG manages. The restoration activities will potentially adversely affect Idaho waters and aquatic resources through introduction of non-native species, undesirable species, and/or fish pathogens into Idaho waters if appropriate measures are not taken, such as consideration for sequence of events pertaining to barrier removal and exotic species removal (EES 2006) and implementation of Best Management Practices to protect water quality and aquatic resources. These details would be considered by the Technical Committee during its review, modification, and approval of proposed restoration projects. Further, activities occurring in Idaho will benefit fishery resources affected by the Box Canyon Project, particularly once passage at Albeni Falls Dam is implemented.

Inclusion of Idaho DFG in the Technical Committee will allow it the ability to participate in discussions of issues which occur in Idaho or have the potential to affect Idaho fishery resources, and will be consistent with prior Commission decisions pertaining to Idaho DFG's participation in matters pertaining to Section 4(e) conditions and Section 18 prescription (2010 Settlement Order at P 12). Commission staff recommends Idaho DFG be included as a member of the Technical Committee.

#### *Revised Section 18 Fishway Prescription*

The revised Section 18 fishway prescription removes the requirement to install and operate a downstream fishway capable of achieving 95 percent passage via a non-turbine route at BCD for the current license term. The intakes and turbines at BCD have the potential to entrain, and injure or kill, fish migrating downstream past the dam (when the project is operating) due to exposure to extreme pressure changes, strike events, sheer stress, turbulence, grinding, and cavitation (Čada and Rhinehart 2000, Čada 2001, FERC 2004 at 113). Additionally, delayed injury or mortality (usually measured for 48 hours after entrainment) could occur when fish are stunned and subject to predation by birds in the tailrace, or infection from wounds associated with passage through turbines. The percentage of fish subject to injury and mortality increases commensurate with the size of the fish passing through the turbines.

Without a downstream fish passage facility at BCD, downstream passage will continue to occur through the spillway (during periods of spill) and through the turbines. The annual injury and mortality rates for fish passing downstream through the turbines will remain roughly equivalent to the conclusions in Normandeau 2012. Therefore, as described above in *Section 4.4.1 Affected Environment*, survival will remain high for all fish passing downstream via spill, and fish >10 inches long (250 mm) will incur

maximally 16 percent mortality or injury through the turbines. Since the downstream fishway only required collecting and passing fish  $\geq 10.0$  inches (250 mm), the revised prescription will not change impacts to salmonids  $< 10$  inches (250 mm). Based on the passage study, we expect that even with 100 percent juvenile fish passage through the turbines, more than 97 percent will pass downstream unaffected.

While the downstream passage study results indicate that the impacts of the spillways and turbines may not be as significant as originally believed (e.g., 10-24 percent entrainment mortality for fishes less than 8 inches (200 mm) in length, and a higher percentage expected for fish larger than 8 inches (200 mm); FWS 2005), injury and mortality during downstream passage will be a factor in the continued depression of target species populations in the BCR. Further, entrainment mortality rates will be higher than what would occur following completion of downstream passage under the current fishway prescription (the no-action alternative) (FERC 2020). Operation of the project for the duration of the license will continue to result in passage delays for subadult and adult target species, as well as injury or mortality due to contact with structures within the facility and while staging for downstream passage.

The revised fishway prescription removes the requirements to provide downstream fish passage facilities at the CCPP, therefore the licensee will no longer be required to install a fish exclusion barrier (i.e., full screening of Calispell Creek) to prevent entrainment and impingement of downstream migrating target fish species  $\geq 4.0$  inches ( $\sim 100$  mm) in total length, and designed to guide target fish species to the screw pump (Hidrostal or Archimedes type pumps). Without downstream passage, effects to native and non-native fish passing downstream at CCPP will still have the potential to be entrained and injured or killed by the pumps at the CCPP (FERC 2004 at 113). For the target species, this will affect cutthroat trout moving downstream at the CCPP, but mountain whitefish and bull trout will not be affected as they are not present above CCPP. Effects of entrainment for fish in the system will remain unchanged from the current state, but the revised prescription will increase the potential for entrainment injury and mortality compared to what would occur if fish passage was provided.

The revised fishway prescription removes the requirements to provide upstream fish passage facilities at the CCPP, therefore the licensee will no longer be required to install upstream trap-and-haul fishway at CCPP for of juvenile, sub-adult and adult target fish species  $\geq 4.0$  inches ( $\sim 100$  mm) in length. For target species, only westslope cutthroat trout are found in Calispell Creek. In the Lower Pend Oreille Subbasin, the resident form of cutthroat trout reside in the tributaries, as the fluvial form of cutthroat trout has been largely lost due to mainstem dams. While several tributaries in the Pend Oreille River watershed support genetically distinct populations of westslope cutthroat trout (Shaklee and Young 2000; Young et al 2004), the genetic diversity of westslope cutthroat trout in Calispell Creek will continue to be limited due to the loss of the fluvial life history and the probability of hybridization with non-native rainbow trout that are

present in the system (POSRT 2007). Bull trout and mountain whitefish are not known to occur in Calispell Creek above the CAPP, and their access to approximately 21 miles of natural barrier-free waters in the creek and its tributary streams and potential for natural recolonization of Calispell Creek will continue to be prevented without installation of upstream passage.

The revised fishway prescription requires the licensee to undertake downstream fishway investigations and population monitoring, which will provide information about the baseline population status and condition of target fish species in target watersheds of the Box Canyon and Boundary reservoirs, and allow assessment of the population status and trends for the remainder of the license term. Since population data for the report is already available from existing monitoring efforts and data summaries, state and federal agencies, and Tribes, additional fieldwork (that is, in addition to what is already required of the licensee) is not expected for the preparation of the baseline condition report, unless no information otherwise exists for target tributaries. Following the baseline condition report, the licensee will undertake a monitoring program to assess the target fish species population status and trends, and will provide reports every five years. The implementation of the monitoring program will include analysis of movement data of adfluvial populations of the target fish species which are collected, handled, and tagged from the upstream fish passage facility at BCD and at other locations as appropriate. Target fish species will experience some stress as a result of the capture, handling, and tagging, which is expected to have a temporary adverse effect (Kelsch and Shields 1996, Rub et al 2014). However, the collection, handling, and tagging of target fish species is performed as part of ongoing studies related to other requirements, such as the upstream fishway effectiveness monitoring program,<sup>39</sup> therefore implementing the monitoring program under the revised fishway prescriptions will have few additional effects to target fish species.

We expect that the downstream fishway monitoring activities will provide information about downstream passage related injury and mortality at BCD, which can be compared to survival estimates reported in Normandeau 2012. Further, the monitoring efforts will be synchronized with other efforts in the Lower Pend Oreille River basin, including studies conducted by SCL at the Boundary Project. In comments included in its August 1, 2019, intervention, SCL stated that the revised section 18 fishway prescriptions could affect its fishery resources and interests at the Boundary Project, which is immediately downstream from the Box Canyon Project. The revised prescription will affect fisheries investigations and monitoring in the BCR and Boundary reservoir, and the licensee will need to cooperate with SCL to facilitate exchange of data or synchronization of monitoring. Some level of coordination and cooperation already occurs through both implementation of both licenses and other fisheries restoration

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<sup>39</sup> *Pub. Util. Dist. No. 1 of Pend Oreille Cnty.*, 154 FERC ¶ 62,026 (2016).

efforts in the Pend Oreille River basin, which is not expected to change as a consequence of the proposed action. We suggest that the licensee continue to cooperate with SCL during fisheries restoration efforts.

The monitoring program is expected to benefit target fish species by providing information important for guiding restoration and management activities in the Pend Oreille River basin, and for informing future fish passage needs at the BCD in particular.

#### *Off-License Settlement Agreement*

The OLSA will direct funding from the off-license Watershed Program and Conservation Program toward multiple efforts to benefit aquatic resources and habitat. The purposes of the Watershed Program will be to complete restoration measures in the mainstem Pend Oreille River and its tributaries in order to help mitigate the effects of the Project, and efforts under the Watershed Program will be coordinated with the conservation priorities identified in the Comprehensive Plan required by the revised THRP. The Conservation Program will mitigate Project effects in lieu of upstream and downstream fish passage at the CCPP, allowing the licensee to reallocate resources to alternate conservation measures that will more timely and effectively mitigate Project effects than would upstream and downstream fish passage at the CCPP. The Conservation Program also provides the Tribe with options for improving harvest opportunities, and to protect access to and use of natural resources of importance to the Tribe through measures such as fish passage and fish management (e.g. non-native fish control and target fish species supplementation) and acquisition of conservation easements and/or land to protect fish and wildlife habitat. Implementation of the OLSA will improve connectivity in the Pend Oreille River basin, benefit water quality and aquatic habitat conditions for target fish species.

### 4.5 Threatened and Endangered Species

#### 4.5.1 Affected Environment

Federally listed bull trout, grizzly bear, and Canada lynx may occur in the project vicinity (Table 3). Critical habitat for grizzly bear or lynx is not designated in Pend Oreille County, Washington, and Bonner County, Idaho, although the proposed activities may overlap with the ranges of these species. Of all the species, only bull trout are potentially present in the study area.

**Table 3. Species listed under the Endangered Species Act, their listing status, potential occurrence in the project area, and critical habitat.**

<b>Common Name (Scientific Name)</b>	<b>ESA Status and Year Listed</b>	<b>Critical Habitat Present</b>	<b>Status in Action Area</b>
Bull Trout ( <i>Salvelinus confluentus</i> )	Threatened; 1999 (64 FR 58910-58933)	Yes (75 FR 63898)	Present
Canada lynx ( <i>Lynx canadensis</i> )	Threatened; 2000 (65 FR 16052-06086)	No	Not known to be present
Grizzly bear ( <i>Ursus arctos horribilis</i> )	Threatened; 1975 (40 FR 31734-31736)	No	Not known to be present

Information about the listed species and their habitat is described in the 2004 EIS (FERC 2004 at 165-166; 169-170) and the affected environment remains largely the same for the purposes of this EA; we supplement it here with updated information from the FWS’s revised designation of critical habitat and issuance of the bull trout Recovery Plan (FWS 2015a) and Columbia Headwaters Recovery Unit Implementation Plan (FWS 2015b).

Commission staff issued a report on December 12, 2003 which reviewed the effects of the continued operation of the Box Canyon Project on proposed bull trout critical habitat<sup>40</sup> in the Pend Oreille River Critical Habitat Subunit, which concluded that although the project with Commission staff’s recommended measures is likely to adversely affect bull trout, it would not likely result in adverse modification or destruction of the critical habitat. Since issuance of the 2005 License Order, FWS issued a final revised critical habitat designation for the bull trout (FWS 2010), and finalized its Bull Trout Recovery Plan (FWS 2015a) and Columbia Headwaters Recovery Unit Implementation Plan (2015b). Designated bull trout critical habitat is of two primary use types: 1) spawning and rearing habitat, and 2) foraging, migration, and overwintering habitat. The final revised PBFs (habitat components that are essential for the conservation of bull trout) in FWS 2010 are similar to those previously in effect (FWS 2005), with the most significant modification being the addition of a ninth PBF to address the presence of non-native predatory or competitive fish species (Table 4). Eight of the

<sup>40</sup> FWS proposed to designate critical habitat for the Klamath River and Columbia River populations of bull trout on November 29, 2002 (FWS 2002a). The Commission’s report examined proposed project effects on the proposed bull trout critical habitat, which included the 9 PBF’s in Table 4.

nine PBFs are found within the action area; PBF 6 is not found in the action area. Bull trout critical habitat in the Box Canyon Project area is within the Clark Fork River Basin Critical Habitat Unit 31 and includes most mainstem and tributary habitats (FWS 2010).

**Table 4. Bull trout PBFs.**

No.	Description
1	Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.
2	Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers.
3	An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.
4	Complex river, stream, lake, reservoir, and marine shoreline aquatic environments, and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure.
5	Water temperature ranging from 2-15°C (36-49 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range would depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; stream flow; and local groundwater influence.
6	In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable for bull trout would be likely to vary from system to system.
7	A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph.
8	Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.
9	Sufficiently low levels of occurrence of non-native predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout.

The FWS issued a final recovery plan for bull trout in 2015. The goal of the bull trout recovery plan is to “*manage threats and ensure sufficient distribution and abundance to improve the status of bull trout throughout their extant range in the coterminous United States so that protection under the [ESA] is no longer necessary*” (FWS 2015a). Bull trout within the Box Canyon Project area are within the Columbia Headwaters Recovery Unit, more specifically within the lower basin of the LPO Core Area designated as LPO-C (FWS 2015b). Primary threats to the recovery of bull trout populations in LPO-C include historic and current upland or riparian land management practices, instream impacts, water quality issues, connectivity impairments, small population size, and non-native fishes (FWS 2015b). Since issuance of the 2005 License Order and as described above in *Section 4.4.1 Aquatic Resources*, tributary restoration projects under the THRP and efforts to reduce non-native fish populations have been underway. Bull trout populations in the LPO-C are very small (FWS 2008); since initiation of studies for the fish passage design investigations for BCD and CCPP in 2010, only 19 bull trout have been caught, observed, or sampled within the Boundary or Box Canyon reservoirs (FERC 2020). One extant local population in LeClerc Creek (a tributary to BCR) (FWS 2002b) was identified, but FWS later determined the LeClerc Creek local population was likely functionally extirpated (FWS 2008). Since 2001, bull trout juveniles or redds have not been documented (although surveys have been sporadic), and in 2014 a single bull trout adult was observed by FWS in LeClerc Creek during redd surveys, but no redds were observed. A few bull trout are observed or captured downstream of Albeni Falls Dam every year (Paluch et al 2020 in draft, as cited in FWS 2020b).

#### 4.5.2 Environmental Effects

The proposed revisions to Interior’s 4(e) condition 6 THRP and Interior’s revised section 18 fishway prescriptions are not likely to adversely affect Canada lynx or grizzly bear. Therefore, no effect to Canada lynx or grizzly bear is expected and these species will not be discussed further. The remainder of this section summarizes the effects of the proposed license amendment on bull trout and bull trout critical habitat.

##### *Revised 4(e) Condition 6, Trout Habitat Restoration Program*

There is no change to the restoration measures conducted pursuant to the THRP. The goals of enhancing native trout populations through habitat restoration, enhancements, and supplementation in the revised THRP are consistent with the current THRP and will ensure continuation of the tributary restoration measures already underway as described in Table 2. The aquatic habitat and water quality improvements in BCR tributaries due to the THRP are expected to contribute to native salmonid recovery, although the magnitude and timing of the improvements are uncertain, and whether bull trout recovery criteria will be achieved is uncertain. The beneficial effects of the THRP (e.g., increased stream complexity, suppression of non-natives, and improved water quality) will address many threats identified in the Final Recovery Plan

(Table D-2, at D-17-18; FWS 2015b). Many of the required habitat restoration actions in the THRP may offset the effects of climate change by restoring instream flow and riparian shading, both of which should be expected to result in lower stream temperatures. The continued implementation of the restoration measures under the THRP in the tributaries is not likely to have significant adverse effect to bull trout, and is expected to maintain or enhance critical habitat relative to PBF 3 (prey base), PBF 4 (habitat complexity and diversity), PBF 5 (water temperature and thermal refugia), PBF 8 (water quality and quantity), and PBF 9 (low levels of occurrence of non-native predatory, interbreeding, or competing species).

Implementation of the THRP will maintain and eventually improve conditions in the tributaries relative to PBF 3 by increasing instream habitat diversity and improving riparian conditions, which will likely increase the abundance of important forage fish species available for bull trout consumption. Measures in the THRP, such as instream and riparian restoration and maintenance activities, purchase of land or conservation easements, and barrier removal, will also improve habitat diversity in several project area tributaries, which will contribute toward maintenance or enhancement of complex stream channels relative to PBF 4. These measures will also contribute toward maintenance or enhancement of water quality and quantity conditions in the action area. Tributary streams currently provide thermal refugia, and several THRP measures, such as riparian restoration or placement of large woody debris to provide stream shading, will contribute to reducing or maintaining both tributary and mainstem temperatures (PBF 5) through the remainder of the license. Similarly, the THRP measures such as purchase of land or conservation easements, instream and riparian restoration, and barrier removal will also contribute toward maintenance or enhancement of water quality and quantity conditions (PBF 8). The efforts to remove non-native predatory fish species will improve conditions in the tributaries for bull trout relative to PBF 9 by reducing predation and competition.

The THRP provides a list of potential restoration measures that may be enacted, but leaves the specific details and location of the restoration projects to future planning and decisions by the licensee and Technical Committee. Therefore, consultation will be necessary in the future in order to fully assess the total scope of benefits expected from implementation of the THRP relative to PBFs 3, 4, and 9. No other direct or indirect effects are anticipated to occur relative to PBF 1 (springs, seeps, groundwater sources, and subsurface water connectivity), PBF 2 (unimpeded migration corridor), PBF 6 (suitable spawning gravel) and PBF 7 (natural hydrograph) as a result of implementation of the revised THRP.

The revised THRP will modify the success criteria for the proposed restoration projects. Each proposed restoration project will identify measurable success criteria and monitoring methods to determine whether the objectives of the restoration project have been met. If monitoring determines that success is not achieved, the licensee will develop a remediation plan to correct the deficiencies. With this revision, the THRP will

no longer require comparison of a restored reach to a reference stream system to determine whether restoration goals are met. The revision permits an adaptive approach to assess how the restoration projects and measures are performing by establishing site- and project-specific restoration objectives. The success criteria will still require monitoring of restoration projects and agreement from the Technical Committee that restoration objectives are met, therefore the revised success criteria are not likely to adversely affect bull trout and bull trout critical habitat.

The revised THRP will no longer specify the spending limitations that apply to the implementation of the tributary restoration measures. Part of the primary strategy for recovery of bull trout is to improve the understanding of how various threat factors potentially affect the species, and to use that information to cooperatively design, fund, prioritize, and implement effective conservation actions in those areas that offer the greatest long-term benefit to sustain bull trout and where recovery can be achieved (FWS 2015a). The Columbia Headwaters Recovery Unit Implementation Plan describes primary threats in LPO-C (FWS 2015b at D-87 to D-90), and highlights and prioritizes management actions that will maximize conservation benefits for bull trout (FWS 2015, Table D5 at D-134 to D-136). The 2019 Settlement and the revised THRP reflect the parties' updated prioritization of presently unfunded, but high priority conservation actions needed throughout the Lower Pend Oreille River basin that are expected to have greater conservation value in the near term. The removal of the funding cap in the THRP will not interfere with or prevent implementation of the measures specified in the THRP, and is therefore not likely to adversely affect bull trout and bull trout critical habitat.

The revised THRP will modify the planning, project development, and approval process of the THRP in order to reflect specific direction of the Technical Committee. The modified administration of the program will ensure the THRP will follow the best available science and maximize program benefits to bull trout and bull trout critical habitat. The revised 4(e) THRP will also require the licensee to facilitate, in coordination with the Technical Committee, the development of a Comprehensive Plan for stream restoration projects in Pend Oreille County, through which the licensee will work with other stakeholders in the Pend Oreille River basin to develop goals for habitat restoration, prioritize restoration areas, and establish how goals will be achieved, and include a monitoring program to ensure that goals are being met. The parties have already voluntarily initiated the comprehensive planning process in order to make substantial headway in planning and prioritizing projects prior to Commission approval of the proposed amendment.

The Comprehensive Plan will benefit both bull trout and bull trout critical habitat by describing the comprehensive goals for restoration of 164 stream miles of tributary habitat and providing an effective framework to facilitate future restoration planning, project proposal development, and various regulatory approval processes. This approach is consistent with the Columbia Headwaters Recovery Unit Implementation Plan, which

highlights the importance of coordinated implementation of restoration actions to address primary habitat, demographic, and non-native species threats in the LPO-C (FWS 2015b at D87 to D-90).

### *Revised Section 18 Fishway Prescription*

The revised Section 18 fishway prescription removes the requirement to install and operate a downstream fishway capable of achieving 95 percent passage via a non-turbine route at BCD for the current license term. Without a downstream fish passage facility at BCD, downstream passage of bull trout will continue to occur through the spillway (during periods of spill) and through the turbines. When the project is operating, the intakes and turbines at BCD have the potential to entrain, and injure or kill, fish migrating due to exposure to extreme pressure changes, strike events, sheer stress, turbulence, grinding, and cavitation (Čada and Rhinehart 2000, Čada 2001; FERC 2004 at 113). Additionally, delayed injury or mortality (usually measured for 48 hours after entrainment) will occur when fish are stunned and subject to predation by birds in the tailrace, or infection from wounds associated with passage through turbines. Although study has shown the annual injury and mortality rates for trout passing downstream through the turbines are lower than initially anticipated at the time of licensing (Normandeau 2012; as summarized above in *Section 4.4.1 Affected Environment*), without installation of a dedicated downstream passage facility downstream migrating bull trout fish (i.e., adult, subadult, and juveniles) will continue to be adversely affected by entrainment through the turbine or passage at the spillway. Due to the currently low numbers of bull trout upstream of BCD, the adverse effect is expected to be minor, although chronic. Bull trout injury or mortality through spill will remain low (6 percent), and bull trout >10 inches long (250mm) will incur maximally 16 percent mortality or injury through the turbines (Normandeau 2012). While this is a lower rate of mortality than originally considered to occur at the project (FWS 2005), this is a higher rate of injury and mortality than would occur if the current fishway prescriptions were followed (FERC 2020). The revised fishway prescription for BCD will not change impacts to bull trout <10 inches (250mm), therefore we expect that even with 100 percent juvenile fish passage through the turbines, more than 97 percent will pass downstream malady-free.

In addition to injury and mortality that will occur during downstream passage, operation of the project for the duration of the license will continue to adversely affect bull trout by causing passage delays and modifications to natural migratory behavior. The behavior of some bull trout attempting to migrate downstream of BCD will continue to be adversely affected by the structure of the dam to the extent they will not migrate past the project to take advantage of downstream foraging, migration, and overwintering habitat; additionally, injury or mortality will occur due to contact with structures within the facility and while staging for downstream passage. The revised fishway prescription will continue to adversely affect bull trout critical habitat relative to PBF 2 (migration corridor) due to the potential for bull trout injury and mortality during turbine and

spillway passage and the potential for behavioral changes for bull trout attempting to migrate downstream of BCD.

The revised fishway prescription will remove the requirements to provide upstream and downstream fish passage facilities at the CCPP. Bull trout will not be affected by the removal of downstream passage requirements as they are not present above CCPP, and are therefore not subject to entrainment related injury or mortality at the pumping plant. The removal of the requirement to provide an upstream trap-and-haul fishway at CCPP for juvenile, sub-adult and adult bull trout  $\geq 4.0$  inches ( $\sim 100$  mm) in length will maintain the passage barrier at CCPP, preventing bull trout from access to approximately 21 miles (34 km) of natural barrier-free waters in the creek, 13.4 miles (21.6 km) of which are designated bull trout critical habitat, and its tributary streams. This will eliminate the potential for natural recolonization of the suitable and recoverable bull trout habitat in Calispell Creek. Since there are no bull trout populations occupying the Calispell Watershed, the revised fishway prescription will adversely affect bull trout critical habitat relative to PBF 2 (migration corridor) by continuing to prevent access to a substantial portion of recoverable bull trout habitat in the system.

The revised fishway prescription requires the licensee to conduct downstream fishway investigations and population monitoring, which will provide information about the baseline bull trout population status and condition in target watersheds of the Box Canyon and Boundary reservoirs, and allow assessment of the population status and trends for the remainder of the license term. The preparation of the baseline condition report will not adversely affect bull trout since population data for the report is available from existing monitoring efforts; no new fieldwork will be conducted unless information is otherwise unavailable for target tributaries. The licensee will then monitor population status and trends, analyzing movement data from bull trout that are collected, handled, and tagged from the upstream fish passage facility at BCD and at other locations as appropriate. Capture, handling, and tagging is expected to have a temporary adverse effect on adult and subadult bull trout individuals in both the Boundary Dam Reservoir, BCR, and associated tributaries, and the potential for injury or mortality exists due to the stress associated with capture, handling, and tagging and varying effectiveness of the methods (Kelsch and Shields 1996, Rub et al 2014). Because the collection, handling, and tagging of bull trout will be conducted as part of ongoing studies related to other requirements, such as the upstream fishway effectiveness monitoring program,<sup>41</sup> the revised fishway prescriptions will have few additional effects to bull trout.

Connectivity within the Pend Oreille River sub-basin is important for ensuring the long-term health and sustainability of bull trout by preserving the genetic integrity and reducing the risk of local extinctions through re-colonization (FWS 2005 at 51; FWS

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<sup>41</sup> *Pub. Util. Dist. No. 1 of Pend Oreille Cnty.*, 154 FERC ¶ 62,026 (2016).

2015 at D-49). The revised fishway prescriptions will not immediately address the connectivity impairment threats at the CCPP or for downstream passage at BCD. However, the Downstream Fishway Investigations Monitoring Program required by the revised fishway prescription is a long-term undertaking which is expected to benefit bull trout populations by providing information about downstream passage related injury and mortality at BCD and will be used to inform future downstream fish passage needs at the BCD (FERC 2004 at 107). Further, the required monitoring pursuant to the revised prescriptions will be synchronized with other efforts in the Lower Pend Oreille River basin, including studies conducted by SCL at the Boundary Project, and will benefit bull trout in the LPO-C by providing information important for guiding restoration and management activities in the Pend Oreille River basin.

#### *Off-License Settlement Agreement*

The OLSA will direct funding from the off-license Watershed Program and Conservation Program toward multiple efforts that will benefit bull trout and their critical habitat. The Watershed Program funds will be used to complete restoration measures in the mainstem Pend Oreille River and its tributaries, and prioritizes funding for upstream fish passage at Albeni Falls Dam, which (in conjunction with the imminent completion of upstream passage at BCD) will allow LPO-C bull trout access to high quality forage and refugia habitat. Other activities proposed for funding under the Watershed Program will be coordinated with the conservation priorities identified in the Comprehensive Plan required by the revised THRP.<sup>42</sup> The Conservation Program funds will be used to mitigate for anticipated effects of the revised fish passage requirements at the CCPP, with priority for projects most likely to yield water temperature benefits as measured within the project boundary. The off-license Watershed Program and Conservation Program includes (but is not limited to) activities such as non-native fish control and target fish species supplementation, water temperature abatement, land acquisition, and habitat restoration. The non-federal programs funded under the OLSA will help offset adverse effects to bull trout and bull trout critical habitat associated with continued project operations under the current license and the proposed action. The OLSA programs will benefit bull trout through restoration and research actions that will maintain or enhance critical habitat relative to PBF 2 (migratory corridors), PBF 3 (prey base), PBF 4 (habitat complexity and diversity), PBF 5 (water temperature and thermal refugia), PBF 8 (water quality and quantity), and PBF 9 (low levels of occurrence of non-native predatory, interbreeding, or competing species). The total scope of benefits through these programs is currently unknown due to lack of fully developed implementation plans in the OLSA, and therefore cannot be analyzed in this EA. However, the measures in the OLSA have been developed to better align recovery goals in the LPO Core Area to recovery actions

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<sup>42</sup> OLSA at 9.

undertaken by the licensee with the overarching goal is to yield basin-wide benefits for bull trout and other native species.

In comments contained in its intervention, SCL stated that while it agrees with the concept that fish passage at Albeni Falls Dam presents the best opportunity to restore bull trout in the Lower Pend Oreille River, it reserves its support for the amendment of the Box Canyon license pending review of the OLSA and a fuller understanding of its interrelationship with the proposed amendment and potential effects for the Boundary Project. The OLSA is publicly available on the licensee's website. Commission staff's 2011 EIS for relicensing the Boundary Project reviewed cumulative effects of various bull trout recovery activities in the watershed and determined that their implementation is expected to contribute to the recovery of bull trout during the term of the Boundary Project license, and therefore, it is likely that the incidence of bull trout using Boundary Reservoir, tailrace, or tributaries would increase (FERC 2011 at 252). The actions under the OLSA are also expected to contribute to the recovery of bull trout in the watershed, and the effects of its implementation on SCL's interests are expected to be the same.

### *Conclusion*

As discussed in above, the proposed action may affect, and is likely to adversely affect, bull trout and bull trout critical habitat. However, the proposed action will not jeopardize the continued existence of bull trout or result in adverse modification of designated critical habitat. Implementation of restoration and monitoring activities under the revised 4(e) condition 6, revised section 18 fishway prescription, and OLSA, along with the continued implementation of license requirements (including completion of upstream passage at BCD), will contribute to improved conditions for bull trout in the LPO Core Area and improved habitat conditions within the Clark Fork CHU.

### 4.5.3 FWS 2020 Biological Opinion

In its 2020 Biological Opinion, FWS states that the conservation measures negotiated in cooperation with the FWS and included as part of the 2019 Settlement and revised section 18 Fishway Prescriptions and section 4(e) conditions, in conjunction with the OLSA, constitute all of the reasonable measures necessary to minimize the impacts of incidental take (FWS 2020a). Therefore, the reasonable and prudent measures included in the ITS are requirements for monitoring and reporting. FWS also provides terms and conditions, which implement the reasonable and prudent measures and outline the reporting and monitoring requirements. The terms and conditions require that if the authorized level of incidental take is exceeded during the course of the action, the Commission must immediately provide an explanation of the causes of the taking and review with the FWS the need for possible modification of the reasonable and prudent measures. Further, the FWS must be notified within three working days of discovery of a dead, injured or sick bull trout.

Conservation recommendations are discretionary agency activities<sup>43</sup> designed to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. FWS's 2020 Opinion included two conservation recommendations, which are: (1) that the Commission and licensee assist and/or provide funding for the removal and long-term management of non-native predatory species (i.e. northern pike, walleye, smallmouth bass, and others) in the mainstem Pend Oreille River; and (2) that the Commission and licensee cooperatively participate and/or fund efforts to implement bull trout reintroduction or supplementation into the Pend Oreille River and its tributaries downstream of Albeni Falls Dam.

The Columbia Headwaters Recovery Unit Implementation Plan identified non-native fish as a primary threat in LPO-C (FWS 2015b). Due to the low abundance of bull trout in the LPO-C it is important for their recovery to minimize or eliminate the negative effects of interactions with non-native fish (e.g., predation, competition, and hybridization) (FWS 2015a). The presence of the reservoir has contributed to proliferation of non-natives (2004 EIS at 85) and non-native fish are a primary threat in the Columbia Headwaters Recovery Unit in part due to the relative ease with which they seem to be established in lacustrine foraging, migration, and overwintering habitat (FWS 2015b at D-176). The current and revised THRP includes measures to remove non-native fish in any tributary stream reach if considered necessary by the Technical Committee. Further, there are efforts outside of the license requirements which are addressing non-native fish in the project area: KNRD and Washington DFW have been removing northern pike from BCR since 2012 (KNRD and Washington DFW 2020), and the OLSA includes funding for non-native fish control under the Watershed Program and Conservation Program. The licensee will soon have the ability to sort and cull non-native predatory fish species at the upstream fish passage facility at BCD,<sup>44</sup> which will also allow for management of non-native fish at the project.

Commission staff agree that removal and long-term management of non-native predatory species will improve conditions in the BCR for bull trout critical habitat relative to PBF 9 (low levels of occurrence of non-native predatory, interbreeding, or competing species), and is consistent with the recovery tasks described in the Columbia Headwaters Recovery Unit Implementation Plan (FWS 2015b at D-89). However, the license already requires sufficient measures to protect and enhance bull trout habitat, and various off-license measures also address control of non-native predators. The Commission generally does not favor environmental enhancement funds, preferring to require licensees to undertake specific measures to resolve specific project effects,

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<sup>43</sup> See *supra* note 20.

<sup>44</sup> *Pub. Util. Dist. No. 1 of Pend Oreille Cnty.*, 153 FERC ¶ 62,161 (2015).

particularly where it is not clear to what extent the funds will be used for activities that are related to the project.<sup>45</sup>

FWS's second conservation recommendation recommends that the Commission and licensee participate in and/or fund bull trout reintroduction or supplementation efforts. The 2004 EIS recognized hatchery supplementation would likely have a major role in the restoration of bull trout and westslope cutthroat trout, given the depressed status of native salmonids in BCR and its tributaries, and noted that funding of hatchery operations in combination with long-term habitat restoration efforts would help to restore native trout populations within the Box Canyon portion of the watershed (FERC 2004 at 124). The 2004 EIS did not recommend specific funding dedicated to a hatchery supplementation program, but Commission staff agreed that the licensee's trout restoration funding could be applied to reintroduction efforts (FERC 2004 at 312, C-66, and C-70). In watersheds where bull trout populations have been severely reduced or extirpated and connectivity impairment is likely to prevent natural recolonization, active reintroduction or supplementation of bull trout from appropriate source populations may help reestablish viable local populations to improve core area status (FWS 2015a at 29). Ongoing habitat restoration efforts and future improvements to mainstem connectivity will enable reintroductions to begin in recipient systems with adequate habitat for bull trout release, and a structured decision making process can be used to identify optimal sites and methods to achieve a successful reintroduction of bull trout (Hayes and Banish 2017, Benjamin et al 2019). Specifically in the Pend Oreille River, even with recolonization of habitats being more likely with the provision of upstream passage at BCD and Albeni Falls Dam, some level of translocation and reintroduction may be necessary to establish populations at sustainable levels (Dunham et al. 2014, as cited in FWS 2015b at D-29). We note that SCL will be constructing a fish propagation facility in compliance with its license for the Boundary Project, which could potentially be used for regional needs.<sup>46</sup>

Commission staff agree that bull trout reintroduction or supplementation would be helpful to reestablish viable local populations and is consistent with current management and recovery objectives for bull trout (FWS 2015a, 2015b). The OLSA and revised

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<sup>45</sup> See *Policy Statement on Hydropower Licensing Settlements*, 116 FERC ¶ 61,270, at PP 25-26 (2006).

<sup>46</sup> As relevant here, in a February 26, 2021 filing, SCL indicated that it is currently discussing use of the Native Salmonid Fish Conservation Facility with stakeholders (including PUD) to determine its operation as either a regional-use or SCL-only facility. SCL is hoping to go to bid in 2020 with the currently designed facility and Pend Oreille PUD as a partner. If this cannot be arranged, SCL is planning to reduce the size of the facility to meet only the needs of SCL (SCL 2020).

THRP include supplementation activities as potential restoration measures. However, as noted above, the Commission prefers to require a specific measure to be implemented at or close to the project rather than a general expenditure of funds. In this instance, we conclude that cooperatively participating and/or funding efforts to implement bull trout reintroduction or supplementation into the Pend Oreille River and its tributaries downstream of Albeni Falls Dam is too broad in scope to relate to project effects and purposes. Additionally, the Commission does not fund the activities of its licensees, or otherwise carry out any of the actions under the terms of a Commission-issued license, but authorizes the licensee to carry out those actions pursuant to the license terms.

For these reasons, Commission staff do not recommend adoption of these two conservation recommendations. The licensee may, of course, provide funds to FWS for non-native fish management and/or bull trout supplementation activities, or otherwise participate in these activities, outside of the license.

## 4.6 Cultural and Historic Resources

### 4.6.1 Affected Environment

The Commission, as the NEPA lead agency, must consider the effect of its federal action on properties listed or eligible for listing in the NRHP under Section 106 of the NHPA. Pursuant to Section 106 and the implementing regulation under 36 CFR Part 800, the Commission must consider whether any historic property could be affected by the proposed action within the project's APE. The APE is defined as "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR 800.16(d)).

The APE for the Box Canyon Project encompasses both banks of the Pend Oreille River for 55.7 miles between Albeni Falls dam and BCD, and roughly corresponds to the established FERC project boundary. The APE also includes 493 acres within the KIR and 190 acres within the Colville National Forest.

As discussed in the 2004 EIS, the project area occupies the aboriginal territory of the Kalispel Tribe of Indians. In 1955, the licensee constructed the first hydropower facility on the Pend Oreille River at Box Canyon, after acquiring the flowage easement rights from the Tribe. The primary defining attributes of the Pend Oreille drainage basin are the barrier falls which block migration of anadromous fish to the Pend Oreille River, the relatively high density of significant camas grounds supported by extensive wetlands along the river, and the relatively low gradient waters that allow for two-way canoe travel. This later allowed the Pend Oreille River to serve as an important trade route.

The Box Canyon Hydroelectric Project consists of the following primary components: the dam, main spillway, gantry crane, auxiliary spillway, the forebay,

intakes, powerhouse, and switchyard. Other features in the area include a Quonset hut workshop, a Quonset hut equipment storage shed, and recently constructed interpretive office building and park area. In 2006, a study recommended the primary components of the project as contributing resources of a National Register-eligible historic district.

Past studies have included background research and a survey managed by the Tribe in 1999 and 2000 that covered 512 acres along 43.1 miles of shoreline where owners granted access. The surveys identified 43 newly identified sites and 29 previously recorded sites (FERC 2004). The 72 sites included 48 prehistoric sites, 19 historic period sites, and 5 sites that have both prehistoric and historic components. Also in 2000, the Tribe conducted a locational surveys on the 2-acre Old Town Recreation Site and the 430-acre Reisley Ranch. In summer 2001, the Tribe conducted a locational survey of the Bryant property, a 241-parcel purchased by the licensee for habitat enhancement. This survey identified 16 sites, including 14 prehistoric sites and 2 historic sites.

On April 9, 2008, the Commission issued an Order Approving Historic Properties Management Plan,<sup>47</sup> which included the following: (1) identification of historic properties within project's APE; (2) continued use and maintenance of historic properties; (3) protection of historic properties threatened by shoreline erosion, other project-related ground-disturbing activities and vandalism; (4) mitigation of unavoidable adverse effects on historic properties; (5) treatment and disposition of any human remains that may be discovered, taking into account any applicable state laws and the Advisory Council's Policy Statement Regarding Treatment of Human Remains and Grave Goods; (6) compliance with the Native American Graves Protection and Repatriation Act if Tribal or Federal lands are within the project area; (7) protection of previously unidentified historic properties during project operations; (8) public interpretation of the historic and archaeological values of the project; and (9) coordination with the SHPOs and the interested persons during implementation of the HPMP. The HPMP establishes a process for identifying the nature and significance of historic properties that may be affected by project operation, establishing guidelines for routine maintenance, operation activities, proposed improvements to project facilities, and/or public access. The HPMP also defines goals for preservation of historic properties, establishing a decision-making process and outlining procedures for consulting with the SHPOs, the Forest Service, the Tribe, and other interested parties concerning the potential effects of the project on historic properties.

#### 4.6.2 Environmental Effects

Pursuant to section 8.4.1. of the project's approved HPMP, certain activities and locations are exempt from archaeological review such as activities that will not disturb

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<sup>47</sup> See *supra* note 24.

National Register-eligible archaeological sites because the activities occur within previously disturbed areas and outside of boundaries of known archaeological sites. Additionally, the licensee does not have to consult for watershed restoration activities such as planting, seeding and mulching if there is no ground disturbance pursuant to the project's approved HPMP. Further, the revised section 18 fishway prescriptions remove the requirements for providing downstream fish passage at BCD, and upstream and downstream fish passage at CCPP and therefore does not involve any new ground-disturbing activities, nor would impact any National Register-eligible sites. Pursuant to the terms of the project's approved HPMP, no additional consultation pursuant to section 106 of the NHPA is necessary.

## **5.0 CONCLUSIONS AND RECOMMENDATIONS**

Based on our independent review and evaluation of the environmental and development effects of the proposed action, the proposed action with additional staff modifications, and the no-action alternative, we recommend the proposed action, with implementation of the FWS' terms and conditions (*Section 4.5.3 FWS 2020 Biological Opinion*) and staff-recommended measures as the preferred alternative.

Given implementation of the measures in the revised Settlement Agreement described above, as well as the currently enacted above-listed water quality plans and other water quality protection measures, and implementation of the OLSA conditions, there are no anticipated adverse effects to water quality as a result of the proposed action.

The proposed amendment will remove the requirement for downstream passage at BCD, and for up- and downstream passage at CCPP. This will result in continued entrainment related mortality and injury for fish passing downstream at BCD and CCPP, and future colonization of usable critical habitat in Calispell Creek will continue to be prevented without upstream passage. If not appropriately mitigated, this has the potential to adversely affect to aquatic resources, including bull trout which is federally listed as threatened under the ESA. However, the revised THRP requires comprehensive planning for tributary habitat restoration activities and allows investment in high priority restoration activities, which will have beneficial effect for bull trout and other native salmonids. The continued tributary restoration activities will improve water quality, habitat diversity, and riparian conditions for target fish species, and will likely increase the abundance of important forage fish species available for consumption. Additionally, the non-federal OLSA will direct resources to high priority actions (including, but not limited to, provision of passage at Albeni Falls Dam), which will provide basin-wide benefits to bull trout through access to high quality habitats and improved spawning and rearing areas in tributaries. Given implementation of the revised THRP and the OLSA activities, as well as continued implementation of license requirements (such as provision of upstream passage at BCD), we conclude that the proposed action will result in improved water quality and aquatic habitat conditions for target fish species and federally

threatened bull trout. Improved habitat conditions within the lower Pend Oreille river basin (LPO-C) is important to the persistence and recovery of bull trout.

### 5.1 Staff Recommended Measure

Commission staff recommends that Idaho DFG be included as a member of the Technical Committee. This will allow Idaho DFG the ability to participate in discussions of issues which occur in Idaho or have the potential to impact Idaho fishery resources.

### 5.2 Unavoidable Adverse Effects

Some potential effects of the proposed action at the Box Canyon Project are unavoidable or cannot be completely eliminated by the licensee's proposed measures. There will continue to be unavoidable adverse effects due to entrainment and mortality at the dam CCPP and BCD, due to downstream passage through the generating units or when water is spilled. The CCPP will continue to be a barrier to migration and prevent access to potential spawning and rearing habitat in Calispell Creek. Fish mortality or injury during capture, handling, and tagging will be minimized to the extent possible but will remain an unavoidable adverse effect of the proposed monitoring required by the revised fishway prescription. These unavoidable adverse effects are long term and would occur throughout the term of the current license. The magnitude of these effects on native salmonids is difficult to evaluate, due to the small population of native salmonids residing in the BCR and the many non-project factors that also affect native salmonid population abundance in the Pend Oreille basin.

### 5.3 Consistency With Comprehensive Plans

Section 10(a)(2) of the FPA, 16 U.S.C., § 803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. We reviewed the following comprehensive plans that are applicable to the Box Canyon Project located in Washington and Idaho (Table 5). In addition, we considered relevant plans developed by the Tribe and agreements that include the Tribe.<sup>48</sup> Based on our review and analysis, no inconsistencies with these plans were identified.

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<sup>48</sup> (1) Kalispel Tribe of Indians Natural Resources Department. 1997. Fish and Wildlife Management Plan. n.p. (2) Kalispel Tribe of Indians. 1993. Memorandum of Understanding with Washington Dept. Wildlife for Fish Management. (3) Kalispel Tribe of Indians. 1994. Memorandum of Understanding with Washington Dept. Fish & Wildlife for Fishing Licensing and Access Permitting. (4) KNRD, 1994. Watershed/Water Quality Management Plan for the KIR. (5) KNRD. 2017. Resource Conservation Plan. Adopted March 2017.

**Table 5. Applicable Comprehensive Management Plans.**

Author	Title of Plan and Year
FWS	Undated. Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. <i>Undated.</i>
Forest Service	Colville National Forest land and resource management plan. Department of Agriculture, Colville, Washington. 1988.
Idaho Department of Water Quality	Water Quality Standards. 2018.
Idaho Department of Fish and Game	Fisheries management plan, 2013-2018. 2013
Idaho Department of Fish and Game	Management plan for the conservation of Westslope cutthroat trout in Idaho. 2013
Idaho Water Resource Board.	Idaho State water plan. 2012.
National Park Service	The Nationwide Rivers Inventory. Department of the Interior, Washington, D.C. 1993.
Northwest Power and Conservation Council	Columbia River Basin Fish and Wildlife Program. Portland, Oregon. Council Document 2014-12. 2014.
Northwest Power and Conservation Council	The Seventh Northwest Conservation and Electric Power Plan. Portland, Oregon. Council Document 2016-02. 2016.
State of Idaho. State of Oregon. State of Washington. Confederated Tribes of the Warm Springs Reservation of Oregon. Confederated Tribes of the Umatilla Indian Reservation. Nez Perce Tribe. Confederated Tribes and Bands of the Yakima Indian Nation	Settlement Agreement pursuant to the September 1, 1983, Order of the U.S. District Court for the District of Oregon in Case No. 68-5113. Columbia River fish management plan. Portland, Oregon. November 1987.
Washington Department of Community Development.	Resource protection planning process – Paleoindian study unit. 1987.

Author	Title of Plan and Year
Office of Archaeology and Historic Preservation	
Washington Department of Community Development. Office of Archaeology and Historic Preservation	A resource protection planning process identification component for the eastern Washington protohistoric study unit. 1987.
Washington DFW	Management recommendations for Washington's priority habitats: Riparian. 1997.
Washington State Energy Office	Washington State hydropower development/resource protection plan. 1992.

## 6.0 FINDING OF NO SIGNIFICANT IMPACT

If the proposed amendment is approved, with staff's additional recommended measure as discussed above, the project would continue to operate according to its license while providing protection and enhancements to water quality, aquatic resources, terrestrial resources, recreation, and cultural resources. The proposed amendment would remove fish passage requirements at the CCP and remove requirements for downstream passage at BCD for the term of the license. However, these adverse effects are believed to be minor when compared to the benefits associated with the proposed enhancement measures required by the revised THRP. The proposed amendment would provide for continued tributary habitat enhancement activities under the revised THRP, and will include Comprehensive Planning which will improve coordination of restoration activities to benefit native salmonid populations in the BCR and its tributaries. Off-license activities under the OLSA will contribute to restoration activities in the Pend Oreille River and will help offset adverse effects to bull trout and bull trout critical habitat associated with project operations and the proposed amendment. The proposed action is not likely to result in adverse modification or destruction of bull trout critical habitat. Based on our independent analysis, approval of the proposed amendment with the staff-recommended measure would not constitute a major federal action significantly affecting the quality of the human environment.

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