



Final

**Fish Salvage & Temporary Tailrace Barrier Report for the
Wallowa Falls Hydroelectric Project Tailrace**

(FERC No. P-308)

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Table of Contents

1.0 INTRODUCTION..... 3

2.0 STUDY AREA..... 3

3.0 METHODS 5

4.0 RESULTS 6

5.0 CITATIONS 8

APPENDIX A.....9

APPENDIX B.....12

1.0 INTRODUCTION

The Federal Energy Regulatory Commission (FERC) issued a new operating license for the Wallowa Falls Hydroelectric Project (Project) on January 5, 2017. Elements of the new license address fishery resources within the Project area, specifically as they pertain to the Project tailrace. **Article 411** of the license calls for a *Fish Salvage Plan* to be developed within six months of license issuance, “*the licensee must file for Commission approval a fish salvage plan that describes its proposed procedures for capturing, handling, and relocating any fish trapped in the tailrace channel during planned or unplanned unit outage events that dewater the tailrace channel. The fish salvage plan must be implemented each year following license issuance until the permanent tailrace barrier required by Appendix A condition 2(a) and Article 409 is installed and operating. In addition to the handling procedures specified by Appendix C, condition 2, the plan must include the following provisions: (1) Salvaging of fish from the tailrace channel within two hours of the installation of any temporary fish passage barrier required by Appendix A, condition 2(b); and (2) Salvaging of fish from the tailrace channel prior to complete dewatering of the tailrace channel due to a planned or unplanned outage event.*”

Resident and migratory fish species currently inhabit the tailrace channel at varying densities, depending on time of year. Fish species encountered to date consist of rainbow trout (*Oncorhynchus mykiss*), bull trout (*Salvelinus confluentus*), brook trout (*Salvelinus fontinalis*), mountain whitefish (*Prosopium williamsoni*), kokanee (*Oncorhynchus nerka*), and cottid ssp. Infrequent unplanned unit trips with subsequent headgate closures, as well as an annually occurring planned plant outage for maintenance and annual installation of a temporary tailrace fish barrier, all cause the Project tailrace to be dewatered for a length of time great enough to drain the entire reach. During plant outages lasting longer than one hour in duration it is necessary to physically remove, or salvage, fish currently residing therein.

This Report and the information contained within fulfill Plan implementation reporting requirements of Article 411 of the FERC license as well as actions necessary to protect and preserve fishery resources within the Project area.

2.0 STUDY AREA

The Project is located on the East Fork Wallowa River approximately 11 miles outside of the City of Joseph in Northeastern Oregon. The Project (Figure 1) reservoir/forebay lies over 1,600 meters (m) above mean sea level (msl) and is approximately 0.2 surface acres (0.08 ha) in size and averages 5 feet (1.5 m) deep. Because the Project operates as run of river, there is no measurable storage. Though no measurable storage is present in the forebay, habitat in this area is lacustrine, and given the shallow water depth no thermal stratification is present. Substrate in the forebay consists of deposited silt, sand, and other glacial fines.

Water diverted at the forebay travels through the flow line and penstock to the generating turbine in the Project powerhouse. Water exits the turbine and is discharged into an approximately 985-foot (300 m) long tailrace discharge channel that empties into the West Fork Wallowa River. This channel has an average wetted-width of 10 feet (3.1 m) and an average depth of one foot

(0.3 m). The habitat type within the tailrace channel is dominated by high gradient riffle with very few pools.

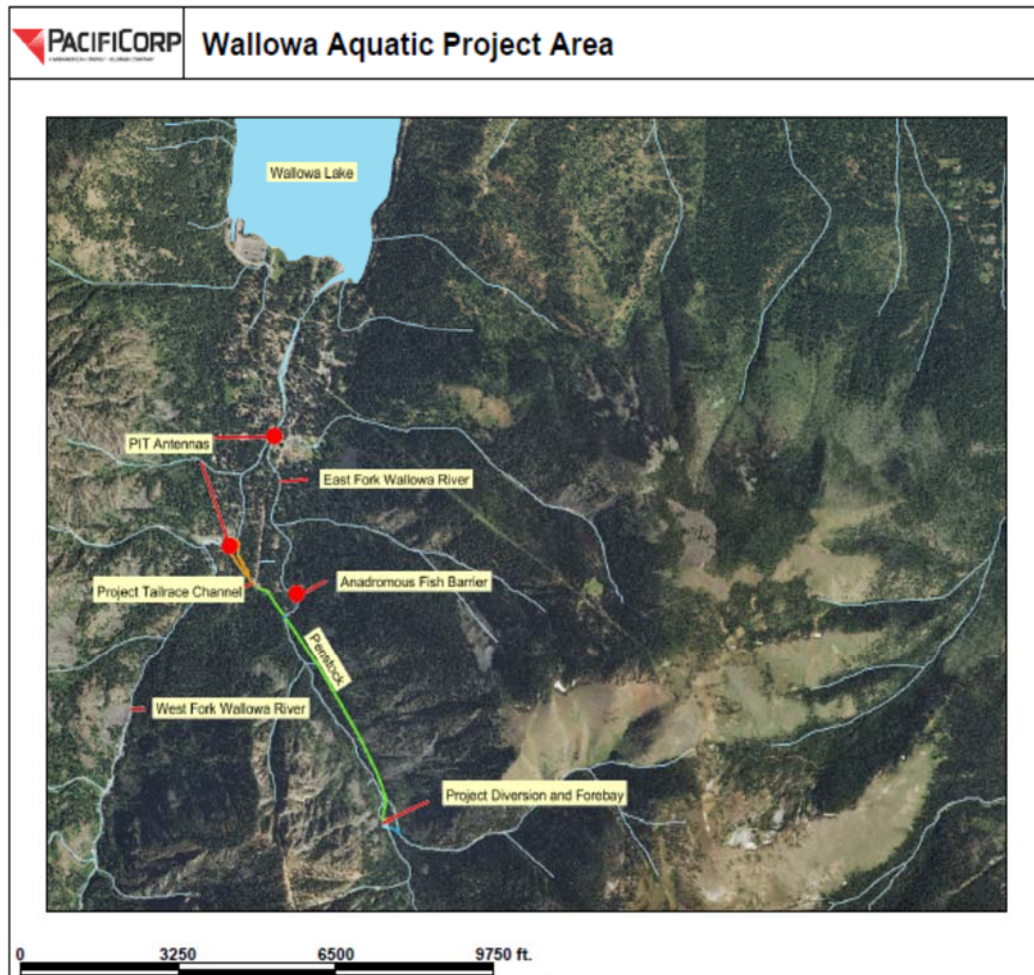


Figure 1 Wallowa Falls Hydroelectric Project.

3.0 METHODS

Onsite observations indicate when the unit trips and the headgate closes it takes approximately 90 minutes for the entire tailrace channel to drain completely of water. Conversely, if the unit trips and the headgate does not close a constant flow of approximately 3 cubic feet per second (cfs) is supplied to the tailrace channel. Thus a fish salvage event is only triggered if the unit trips along with a subsequent headgate closure. Unit trips that do not cause the headgate to close shall trigger no salvage response as the amount of water available within the tailrace channel during this scenario is sufficient for fish survival until the unit is brought back online and full flow once again commences.

Upon notification of a unit trip with corresponding headgate closure, regardless of time of day, a local on-call qualified biologist shall be immediately notified by an operator at Merwin Hydro Control and shall commence with physically rescuing stranded fish from the tailrace channel. The local qualified biologist shall live in such close proximity to the Project so as to be on-site and walking the tailrace channel within 60 minutes of the unplanned unit trip. A Smith-Root LR-24 (or similar model) backpack electrofisher or long-handled dip net shall be utilized to capture stranded fish. If a backpack electrofisher is utilized, it will be set to Direct Current (DC) and applied at the lowest voltage setting possible to still allow capture of stranded fish species. All electrofishing activities will follow protocols as set forth in the National Marine Fisheries Service Backpack Electrofishing Guidelines (NMFS 2000). To remain compliant with stipulations contained within USFWS issued Biological Opinion (BiOp) for the Wallowa Falls Hydroelectric Facility, PacifiCorp shall ensure that fish capture and removal operations are conducted by a qualified biologist, and that all staff participating in the operation have the necessary knowledge, skills, and abilities to ensure safe handling of fish. All planned unit outages with headgate closure will also occur early in the morning to ensure the lowest possible water temperatures for safe fish handling.

In 2017, any and all salvage activities began in the fenced area immediately downstream of the turbine discharge and proceeded in a downstream manner until all areas of the tailrace were thoroughly fished. All captured fish were held in five gallon buckets or small coolers with aerators until liberation into the West Fork Wallowa River downstream of the Project tailrace confluence. Fish capture and removal operations took all appropriate steps to minimize the amount and duration of handling. The operations maintained captured fish in water to the maximum extent possible during seining/netting, handling, and transfer for release, to prevent and minimize stress.

Prior to liberation, all captured fish were quantified and measured to their caudal fork. Due to the presence and possible capture of Endangered Species Act listed bull trout in the Project area, recording of information following contact with said species complied with stipulations contained within the USFWS issued BiOp for this Project which states, "PacifiCorp shall document all bull trout encountered during work site isolation by submitting a fish handling and injury-occurrence report to the Service. The report shall include: 1) the name and address of the supervisory fish biologist; 2) methods used to isolate the work area and minimize disturbances to bull trout; 3) stream conditions before and following placement and removal of temporary barriers; 4) the means of fish removal; 5) approximate the number of fish removed by species

and age class, the number of bull trout removed; 6) condition of all bull trout released; and 7) any incidence of observed injury or mortality to bull trout. Specifically, for all bull trout captured, we ask that the fisheries biologist in charge of handling record the date and time, capture location, capture method used, length and weight of the specimen, condition (if abnormal), search for and record identification numbers from any tags that may be present, and provide the collector's name.”

Also in 2017, a resistance type weir was constructed to serve as a temporary fish exclusionary device at the outlet of the tailrace channel and it's confluence with the West Fork Wallowa River. The resistance weir utilized 25.4 millimeter (mm) diameter polyvinyl chloride (PVC) set to a length of 2.4 meters (m) and spaced apart 6.35 mm by mechanically constructed stringers, the weir was stream-spanning (Figure 2). As extra precaution, a barrier net was also laid across the entire bottom of the upstream side of the weir. The openings of this barrier net were also 6.35 mm and the net was held in place by large sandbags placed end to end along the stream bottom and spanning the entire stream-width.



Figure 2

4.0 RESULTS

Fish Salvage

The Wallowa Falls Tailrace Channel was salvaged for aquatic species twice in 2017. Once on June 26, 2017 due to annual maintenance of the hydroelectric unit and subsequent dewatering of the tailrace channel, and again on July 24, 2017 after the temporary tailrace barrier was installed per Article 411 (1) of the operating license which stipulates that a fish salvage will be performed within two hours of a fish exclusionary device being installed within the channel.

In all, nine rainbow trout (*Oncorhynchus mykiss*) and one brook trout (*Salvelinus fontinalis*) ranging in fork lengths from 95 mm to 250 mm were captured within the tailrace channel. Of these ten captures, all were liberated to the West Fork Wallowa River (Table 1). All fish were captured by a Smith-Root model LR-24 backpack electrofisher set to straight direct current in order to minimize stress from initial capture and all protocols as set forth in the NOAA Electrofishing Guidelines Manual were followed.

Table 1

Date	Species	Fork Length (mm)	Location	Comments
6/26/17	RB	95	Tailrace	Salvage due to de-water for annual maintenance
6/26/17	RB	110	Tailrace	Salvage due to de-water for annual maintenance
6/26/17	RB	99	Tailrace	Salvage due to de-water for annual maintenance
6/26/17	RB	150	Tailrace	Salvage due to de-water for annual maintenance
6/26/17	RB	122	Tailrace	Salvage due to de-water for annual maintenance
7/24/17	RB	110	Tailrace	Salvage after temp. tailrace barrier construction
7/24/17	RB	120	Tailrace	Salvage after temp. tailrace barrier construction
7/24/17	RB	115	Tailrace	Salvage after temp. tailrace barrier construction
7/24/17	RB	250	Tailrace	Salvage after temp. tailrace barrier construction
7/24/17	BRKT	200	Tailrace	Salvage after temp. tailrace barrier construction

Temporary Fish Barrier

Per Article 410 of the operating license, a temporary fish barrier was installed at the outlet of the Wallowa Falls Tailrace Channel on July 24, 2017. This tailrace fish barrier was visually inspected twice per week until taken out on November 15, 2017. At no time during weekly inspections was the barrier visually assessed to be ineffective in precluding fish from entering the tailrace (Appendix A).

5.0 CITATIONS

National Marine Fisheries Service. 2000. National Marine Fisheries Service Backpack Electrofishing Guidelines.

United States Fish and Wildlife Service. 2016. Biological Opinion for the Wallowa Falls Hydroelectric Project.

APPENDIX A
TAILRACE BARRIER WEEKLY INSPECTION NOTES

Date	Observer	Comments
7/24/2017	J. Doyle	Weir completed and installed
7/28/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
7/31/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
8/3/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
8/7/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
8/10/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
8/14/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
8/17/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
8/21/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
8/24/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
8/28/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
8/31/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
9/4/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
9/7/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
9/11/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
9/14/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
9/18/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
9/21/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
9/25/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
9/28/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.

Date	Observer	Comments
10/2/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
10/5/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
10/9/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
10/12/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
10/16/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
10/19/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
10/23/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
10/26/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. Kokanee observed below weir in West Fork.
10/30/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
11/2/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
11/6/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
11/9/2017	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
11/15/2017	Bioresources staff	Weir disassembled and taken out of tailrace channel.

APPENDIX B
AGENCY COMMENTS

AGENCY	COMMENT	UTILITY RESPONSE
ODFW	On page 6, in the paragraph describing the construction and installation of the temporary tailrace barrier, please include the date on which the barrier was installed.	The description of construction of the tailrace barrier in question is in the Methods section of the Report. The date of installation is included in the Results section of the Report, located on page 7.
ODFW	Section 4.0, Results, reports that fish salvage was conducted on August 24, 2017, which appears to be a mistake. Table 1 indicates that fish were salvaged on June 26 and July 24 and the “Temporary Fish Barrier” results reports that the barrier was installed on July 24, 2017. Please make the necessary corrections.	Thank you, correction made to the body of the Report to reflect installation and salvage date of July 24, not August 24.