



**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

<b>1.0</b>	<b>INTRODUCTION.....</b>	<b>3</b>
<b>2.0</b>	<b>STUDY AREA.....</b>	<b>3</b>
<b>3.0</b>	<b>METHODS.....</b>	<b>5</b>
<b>4.0</b>	<b>RESULTS.....</b>	<b>7</b>
<b>5.0</b>	<b>CITATIONS.....</b>	<b>8</b>
	<b>APPENDIX A.....</b>	<b>9</b>

## 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 (17 kilometers) outside of the City of Joseph in Northeastern Oregon. The Project (Figure 1) reservoir/forebay lies over 5,200 feet (1,600 meters) 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.

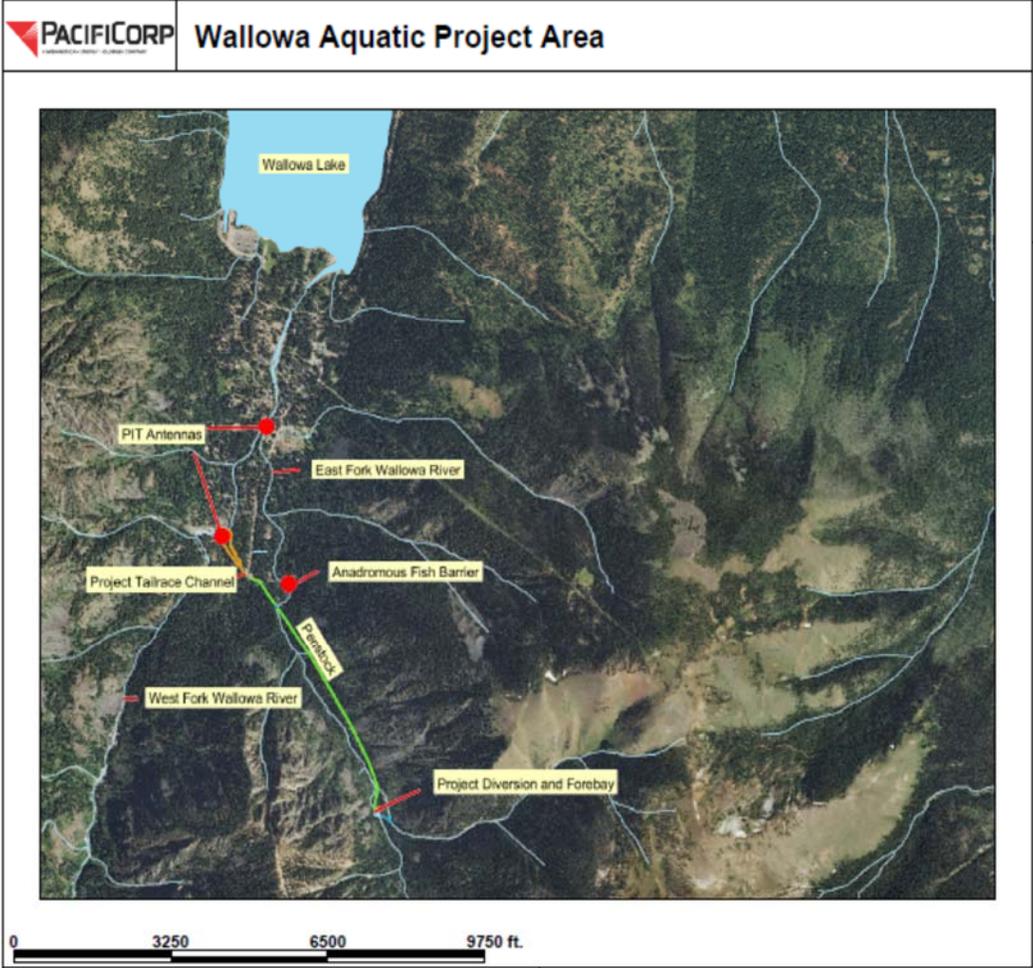


Figure 1 Wallowa Falls Hydroelectric Project.

### 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 was immediately notified by an operator at Merwin Hydro Control and commenced with physically rescuing stranded fish from the tailrace channel. The local qualified biologist lives in 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 was utilized to capture stranded fish. If a backpack electrofisher was utilized, it was set to Direct Current (DC) and applied at the lowest voltage setting possible to still allow capture of stranded fish species. All electrofishing activities followed protocols as set forth in the National Marine Fisheries Service Backpack Electrofishing Guidelines (NMFS 2000). To remain compliant with stipulations contained within the USFWS issued Biological Opinion (BiOp) for the Wallowa Falls Hydroelectric Facility, PacifiCorp ensured that fish capture and removal operations were conducted by a qualified biologist, and that all staff participating in the operation had the necessary knowledge, skills, and abilities to ensure safe handling of fish. All planned unit outages with headgate closure occurred early in the morning to ensure the lowest possible water temperatures for safe fish handling.

In 2018, 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.” This Report and information contained therein shall qualify also as the “fish handling and injury-occurrence report” as stipulated within the USFWS issued BiOp for the Project.

Also in 2018, 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. Photo of Wallowa Falls tailrace barrier in operation. Photo taken on August 2, 2018.**

## 4.0 RESULTS

### Fish Salvage

The Wallowa Falls Tailrace Channel was salvaged for aquatic species on four separate occasions in 2018. The first salvage occurred on May 25 and was due to a unit trip and subsequent headgate drop. No fish were initially observed or captured during salvage activities, but a visual inspection of the dried tailrace channel the next day encountered one dessicated rainbow trout mortality. The second salvage activity occurred on June 11 from planned dewatering due to maintenance of the generating unit. Two rainbow trout were captured and liberated downstream to the West Fork Wallowa River. The third salvage occurred on July 16 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. During this salvage four rainbow trout, two bull trout, and one *Salvelinus* hybrid were captured and liberated downstream to the West Fork Wallowa River. All *Salvelinus* captures were additionally sampled for genetic material to be analyzed at a later date.

In all, seven rainbow trout, two bull trout, and one *S.* hybrid ranging in fork lengths from 124 mm to 200 mm were captured within the tailrace channel. Of these ten captures, all live fish 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
5/25/18	RB	124	Tailrace	Salvage due to unplanned unit trip. MORT.
6/11/18	RB	125	Tailrace	Salvage due to unit maintenance
6/11/18	RB	150	Tailrace	Salvage due to unit maintenance
7/16/18	Bull	119	Tailrace	Salvage after temp tailrace barrier construction
7/16/18	Bull	132	Tailrace	Salvage after temp tailrace barrier construction
7/16/18	hybrid	134	Tailrace	Salvage after temp tailrace barrier construction
7/16/18	RB	200	Tailrace	Salvage after temp tailrace barrier construction
7/16/18	RB	170	Tailrace	Salvage after temp tailrace barrier construction
7/16/18	RB	192	Tailrace	Salvage after temp tailrace barrier construction
7/16/18	RB	168	Tailrace	Salvage after temp tailrace barrier construction
11/1/18	n/a	n/a	Tailrace	Salvage due to unit maintenance. No fish captured or observed.

### 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 16, 2018. This tailrace fish barrier was visually inspected twice per week until taken out on November 15, 2018. At no time during weekly inspections was the barrier visually assessed to be ineffective in precluding fish from entering the tailrace (Appendix A). Maintenance on the generating unit on November 1 granted the

opportunity to test the effectiveness of the tailrace barrier as the tailrace channel was drained dry prior to maintenance activities. No fish were captured or observed during fish salvage activities as the tailrace was dewatering and no fish mortalities were observed after the channel was completely dewatered.

## **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**

<b>Date</b>	<b>Observer</b>	<b>Comments</b>
7/16/2018	J. Doyle	Weir completed and installed
7/20/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
7/23/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
7/26/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
7/30/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
8/2/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. .
8/6/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
8/9/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
8/13/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
8/17/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
8/20/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
8/23/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
8/27/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
8/30/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
9/2/2018	J. Doyle	Weir in place, mechanically cleaned with push broom and working well.
9/6/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
9/10/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well. .
9/13/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
9/17/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
9/20/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.

<b>Date</b>	<b>Observer</b>	<b>Comments</b>
9/23/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
9/28/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
10/2/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
10/6/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
10/10/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
10/12/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
10/15/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
10/18/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
10/23/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
10/28/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
10/30/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
11/2/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
11/6/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
11/10/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
11/12/2018	Bioresources staff	Weir in place, mechanically cleaned with push broom and working well.
11/15/2018	Bioresources staff	Weir disassembled and taken out of tailrace channel.