Final

Bull Trout Redd Monitoring Report for the Wallowa Falls Hydroelectric Project

photo courtesy of Kendrick Moholt

(FERC No. P-308)

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1.0 INTRODUCTION

The United States Fish and Wildlife Service (USFWS) issued a new Biological Opinion (BiOp) for the Wallowa Falls Hydroelectric Project (Project) on October 14, 2016. Monitoring elements within the new BiOp specifically pertaining to Endangered Species Act (ESA) listed bull trout (*Salvelinus confluentus)* were triggered when the Federal Energy Regulatory Commission (FERC) issued a new operating license for the Project on January 7, 2017.

The USFWS listed five reasonable and prudent measures (RPM) to be undertaken in order to minimize incidental take of bull trout by Project operations. Elements within this Plan pertain specifically to RPM 4 which seeks to "*minimize the risk of adverse effects to bull trout from emergency shut-down and ramping".* Section 8.4 4(a) of the BiOp adds specific language and actions to be taken in order to achieve RPM 4.

Bull trout currently inhabit the East Fork Wallowa River (Study Area) at varying densities, depending on time of year. Past redd surveys of the Study Area have revealed bull trout actively constructing redds, while no bull trout redds have ever been observed within the neighboring West Fork.

This Report and the information contained therein fulfills reporting requirements per Section 8.4 4(a) of the USFWS issued BiOp as well as results pertinent to implementation of actions necessary to assess abundance and spatial distribution of bull trout redds within the East Fork Wallowa River.

2.0 STUDY AREA

The bypassed portion of the East Fork Wallowa River within and near the Project area is approximately 2,800 meters (m) long from the Project diversion dam to its confluence with the Wallowa River (Figure 1). Gradient in this reach is high, with the upper 1,600 m averaging 19 percent and the lower 1,200 m averaging 8.5 percent. Channel morphology within most of the upper reach is dominated mainly by steep bedrock, vertical waterfalls, and cascades over boulders; though the upper reaches are steep, the lower 800 m to the confluence with the Wallowa River has a shallower gradient, consisting of numerous riffles and pools. Over the course of its length, the bypassed East Fork Wallowa River drops approximately 365 m from the dam to the confluence with the Wallowa River. The upper and lower portions are divided by a 3.7 m vertical falls (Report cover photo), an impassible upstream migration fish barrier.

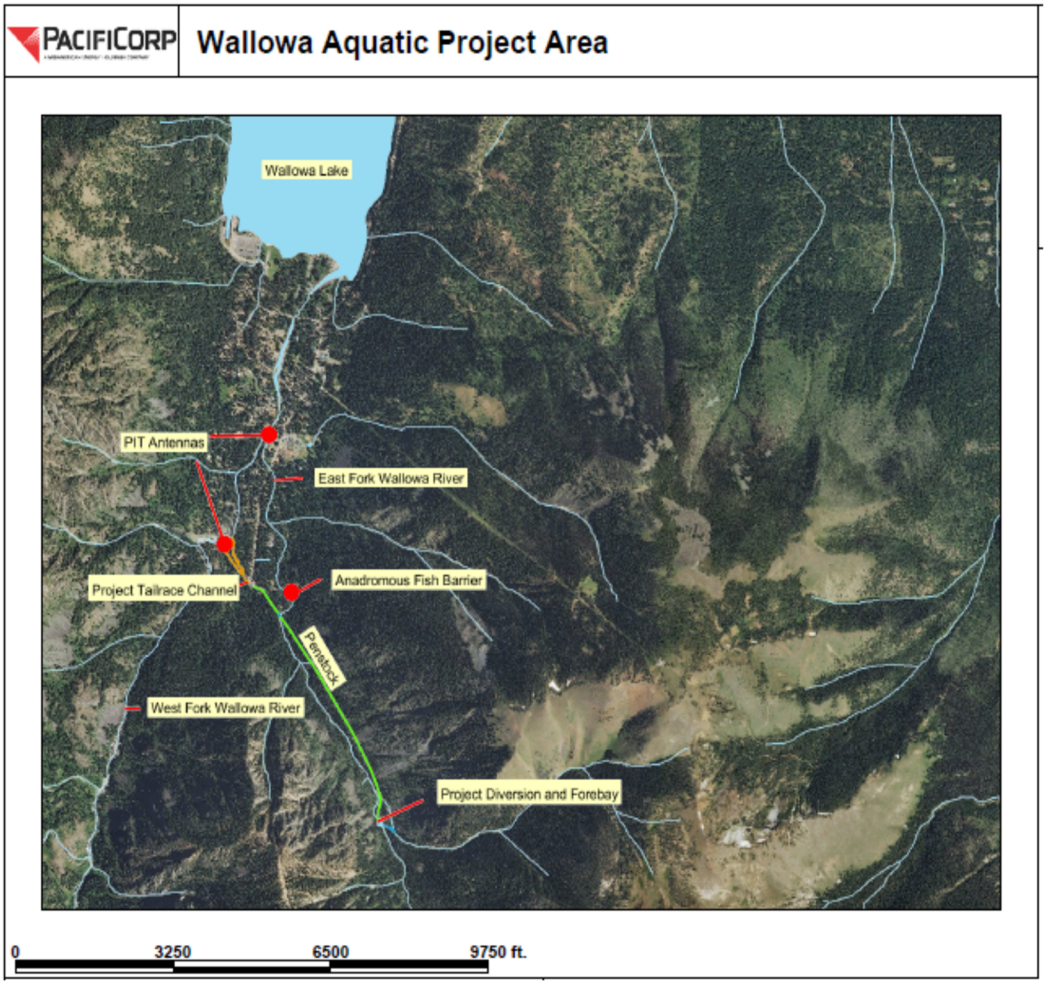


Figure 1. Wallowa Falls Hydroelectric Project.

3.0 METHODS

Section 8.4 4(a) of the BiOp states the following terms and conditions are necessary for the implementation of RPM 4, "*Conduct bull trout redd monitoring in the East Fork Wallowa River (from the upstream falls to the confluence with the Wallowa River) on an annual basis for 10 years to monitor take. FERC/PacifiCorp shall meet with the Service at the end of the 10 year period to determine whether additional years of redd monitoring are necessary GPS and map redds and photo document redds during survey. Measure the size of a redd and its location. Document bull trout observed (<6 inches in length, < 12 inches in length, <14 inches in length, and > 14 inches in length, while conducting redd count and document if bull trout occupy the redd). Note if brook trout are spawning with bull trout. Document flows during annual redd counts and during a shutdown and ramping. Conduct this redd monitoring in mid-September and October. If an emergency shutdown and ramping occurs during the spawning season, the East Fork Wallowa River spawning area will be field visited for any new redds built near the water's edge that could be dewatered due to shut down and ramping. Notify the Service of both positive and negative findings".*

Bull trout redd surveys of the lower portion of the East Fork Wallowa River began August 27, 2020 and continued weekly through October 23, 2020 for a total of ten redd surveys. During each survey the entire lower portion of the East Fork Wallowa River was walked by an experienced qualified biologist, from the confluence with the West Fork Wallowa River upstream 800 m to the migratory fish barrier. In order to standardize inherent observer error, the same experienced surveyor was utilized for all ten surveys in 2020.

All encountered bull trout redds were demarcated by handheld GPS, flagged for visual reference within the stream, measured, and photographed. During subsequent surveys, previously identified redds were revisited and assessed for visibility. Flagging was either marked Still Visible along with the survey date if redd could still be visually identified, or the flagging taken down if the redd was no longer visible. Time taken for redd to no longer remain visible within the stream was recorded in order to assess redd life. Though the Planning document called for only four redd surveys during the spawning period, this being the fourth year of study and redd life still being characterized, ten surveys were performed in order to gain an accurate understanding of visual redd persistence within this watershed. Average and minimum observed redd life will be utilized to adjust frequency of surveys moving forward. Flows during the survey period (Sep-Oct) remained relatively stable and measured between 9-20 cubic feet per second as measured at the United States Geological Survey gage.

All fish observed in the vicinity of identified redds were recorded to species if possible, as well as estimated for fork length.

4.0 RESULTS

Eleven bull trout redds were identified and marked by GPS during the ten redd surveys performed of the East Fork Wallowa River in 2020 (Figure 2). Seven of the bull trout redds were large and indicative of being constructed by large migratory-sized fish, while four were smaller and possibly indicative of being constructed from smaller resident-sized fish (Table 1). All redd observations

in 2020 occurred between September 9 and September 25, with the peak of six counted on September 11. Nine of the eleven observed redds had bull trout either on, actively constructing or in very close proximity to, the redd. First observed in 2020, was the apparent partial superimposition of a previously dug redd, as redd #2 and redd #10 were constructed in the same location. Other and inter-species superimposition will continue to be monitored during future surveys. Pictures of all eleven identified bull trout redds are included in Appendix A. The redd count in 2020 is the highest observed on record, 2017-2020 (Figure 3).

Table 1. East Fork Wallowa River bull trout redd data.

Date	Survey Location	Redd #	Redd Dimension	Live bull trout				Survey Conditions	Redd location same as year prior
				<6 in.	<12 in.	<14 in.	>14 in.		
8/27/2020	EFW, mouth to barrier	n/a	n/a	n/a	n/a	n/a	1	Sunny, calm	n/a
9/5/2020	EFW, mouth to barrier	n/a	n/a	n/a	1	n/a	1	Sunny, calm	n/a
9/9/2020	EFW, mouth to barrier	1	135cm x 50cm	n/a	n/a	n/a	2	Sunny, calm	Yes
9/9/2020	EFW, mouth to barrier	2	115cm x 45cm	n/a	n/a	n/a	3	Sunny, calm	n/a
9/11/2020	EFW, mouth to barrier	3	66cm x 36cm	n/a	1	n/a	n/a	Sunny, calm	n/a
9/11/2020	EFW, mouth to barrier	4	56cm x 28cm	n/a	2	n/a	n/a	Sunny, calm	n/a
9/11/2020	EFW, mouth to barrier	5	120cm x 70cm	n/a	n/a	n/a	1	Sunny, calm	n/a
9/11/2020	EFW, mouth to barrier	6	130cm x 60cm	n/a	n/a	n/a	1	Sunny, calm	n/a
9/11/2020	EFW, mouth to barrier	7	125cm x 50cm	n/a	n/a	n/a	n/a	Sunny, calm	n/a
9/11/2020	EFW, mouth to barrier	8	135cm x 65cm	n/a	n/a	n/a	1	Sunny, calm	n/a
9/18/2020	EFW, mouth to barrier	9	86cm x 40cm	1	n/a	n/a	n/a	Sunny, calm	n/a
9/18/2020	EFW, mouth to barrier	10	120cm x 65cm	n/a	n/a	n/a	2	Sunny, calm	n/a
9/25/2020	EFW, mouth to barrier	11	80cm x 40cm	n/a	n/a	n/a	n/a	Sunny, calm	n/a
10/2/2020	EFW, mouth to barrier	n/a	n/a	n/a	n/a	n/a	n/a	Sunny, calm	n/a
10/9/2020	EFW, mouth to barrier	n/a	n/a	n/a	n/a	n/a	n/a	Sunny, calm	n/a
10/16/2020	EFW, mouth to barrier	n/a	n/a	n/a	n/a	n/a	n/a	Overcast, calm	n/a
10/23/2020	EFW, mouth to barrier	n/a	n/a	n/a	n/a	n/a	n/a	Overcast, calm	n/a

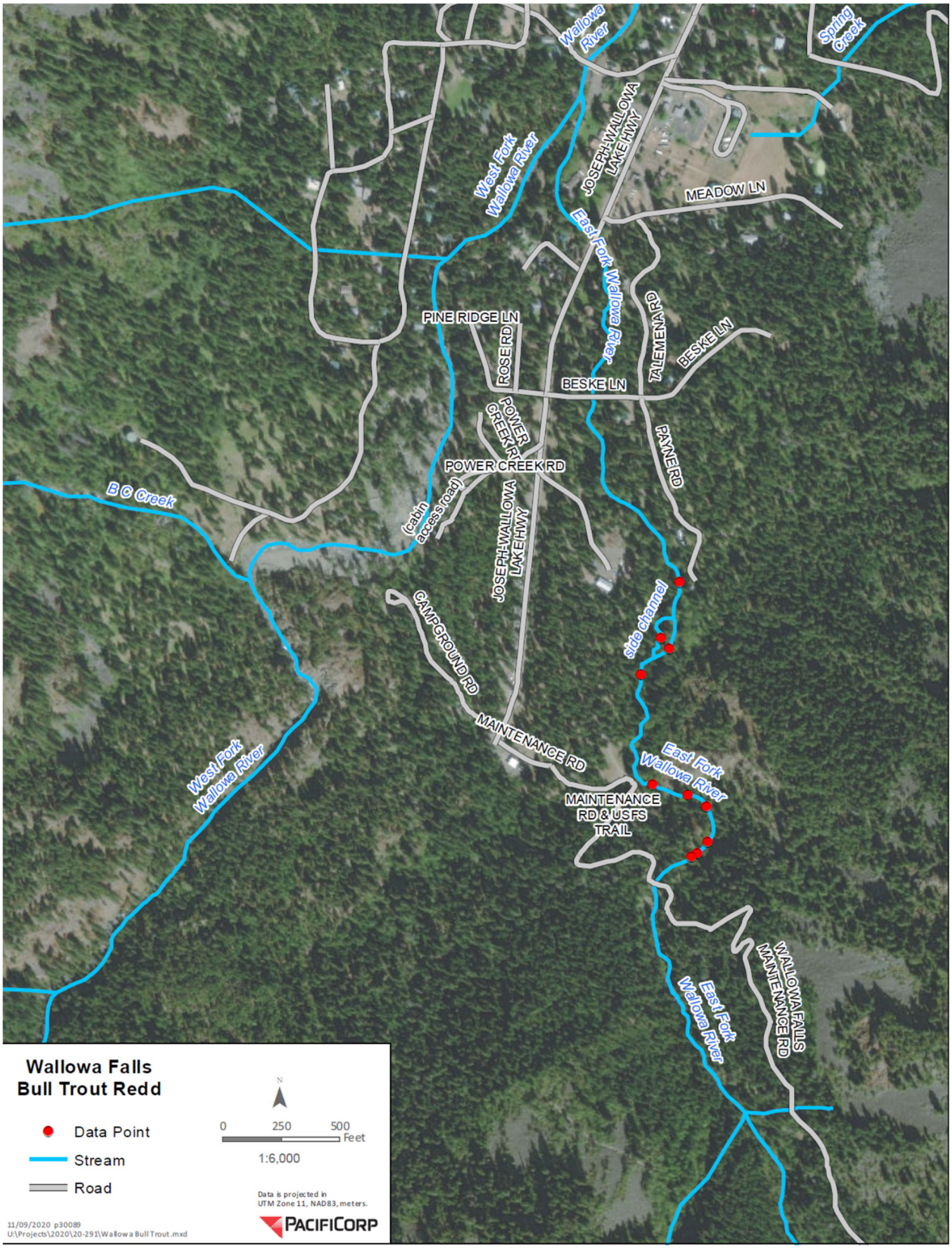


Figure 2. GPS marked locations (red dots, n=11) of bull trout redds within the East Fork Wallowa River

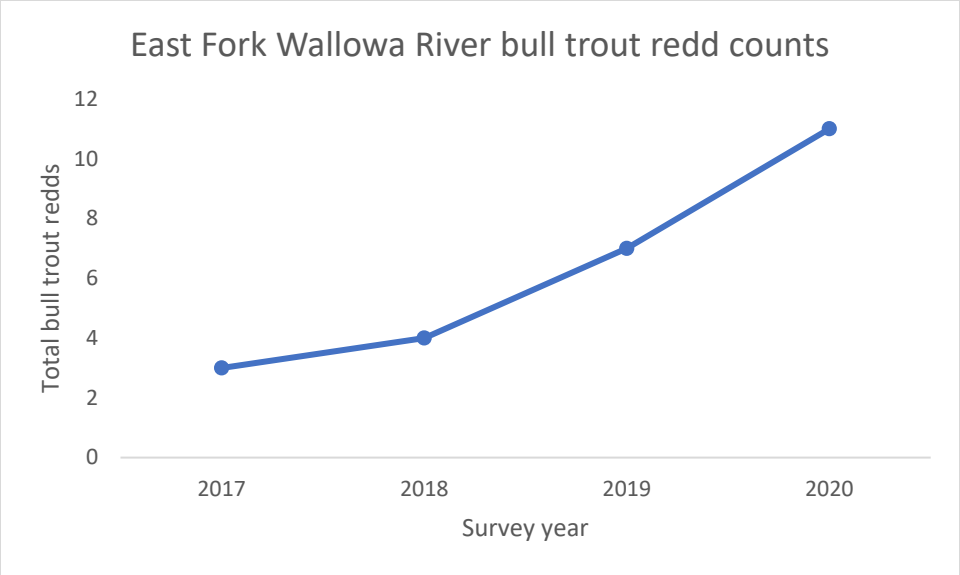


Figure 3. Bull trout redd counts by survey year (2017-2020).

All eleven bull trout redds were in the upper portion of available habitat below the barrier, with the uppermost redd~20 meters below the impassible falls. Redds in 2020 visually persisted for an average of 19 days, with the longest time a redd remained visible being 42 days, and the shortest 14 days. No brook trout were definitively observed during any 2020 East Wallowa River redd surveys.

The generating unit experienced a trip on September 6, increasing the water levels in the East Fork Wallowa River. Before bringing the unit back online on September 9, a redd survey was performed in order to assess if redds had been constructed during the higher than normal flows on the extreme stream margin. The September 9 survey found no redds in areas that could be susceptible to desiccation if the unit was brought back online, and as such the generating unit was turned on and stepped up. All prescribed ramp rates were followed during unit start-up.

This same process was partially repeated on October 13. The unit was ramped to varying generation levels to perform a hydraulic evaluation of the new tailrace barrier during the bull trout spawn timeframe. This evaluation was completed within an 8 hour window, and as such did not require a redd survey to be performed prior to the unit being fully ramped back up.

Other than the above two deviations, flows during the survey period remained stable and never deviated below the prescribed minimum instream flow as measured at the United States Geological Survey gage site.

Given length of redd persistence within the East Fork Wallowa observed for the first four seasons of these surveys (average time of 26 days, 2017-2020), in 2021 it is anticipated bull trout redd surveys will occur on a 10-day rotation during the months of October and September.

5.0 CITATIONS

Oregon Department of Environmental Quality. 2016. 401 Water Quality Certification for the Wallowa Falls Hydroelectric Project.

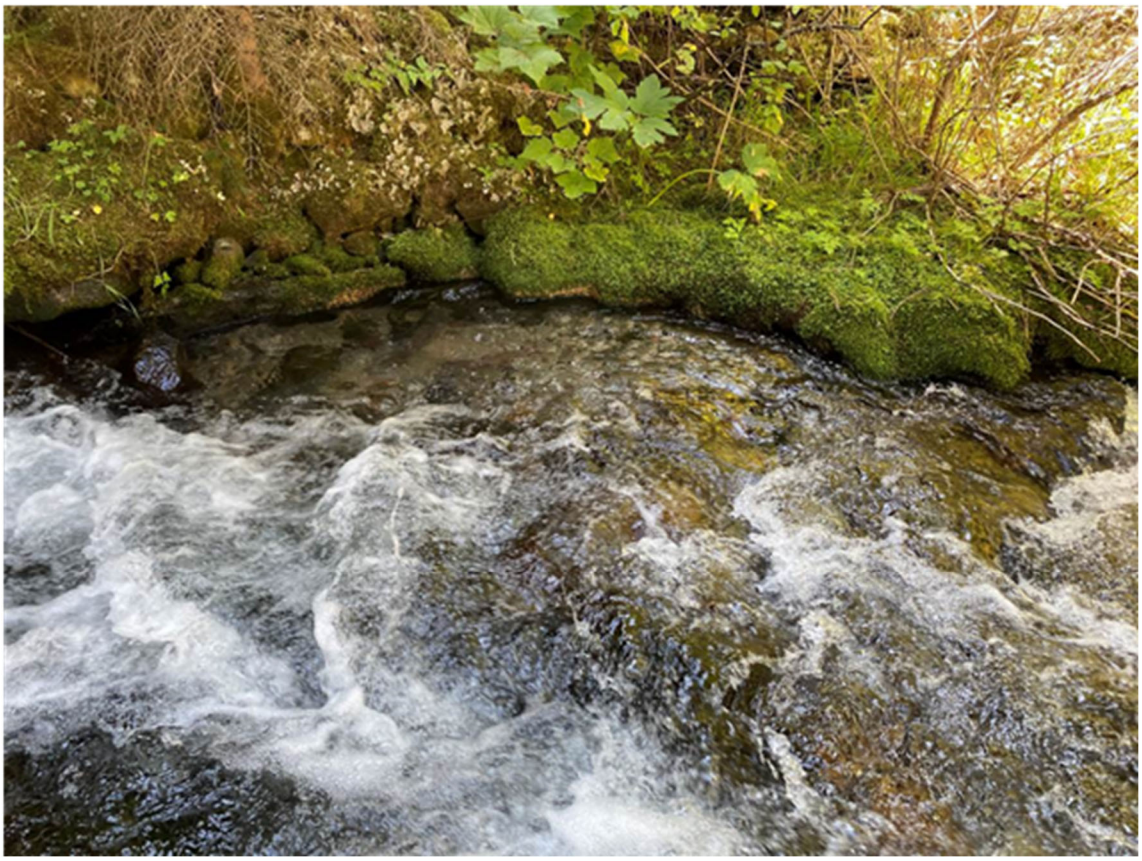
United States Fish and Wildlife Service. 2016. Biological Opinion for the Wallowa Falls Hydroelectric Project.

Appendix A

2020 Bull Trout Redd Photo Documentation

Redd #1

Redd #2



Redd #3

Redd #4

Redd #5

Redd #6

Redd #7

Redd #8

Redd #9

Redd #10

Redd #11