

**MEMORANDUM FOR Biologist, Operations Division (CENWP-OD)**

**SUBJECT:** Bonneville Project, Fishway and Fish Activities for Week 29 of 2022, which covers the period from 10 to 16 July 2022.

**1. OPERATION SUMMARY:**

- a. Daily average river flows ranged from 240.0 to 271.0 kcfs. Daily average powerhouse forebay elevation ranged from 74.8' to 76.0' msl. Daily average project tailwater ranged from 19.1' to 20.7' msl. Secchi disk measurements ranged from 5.0' to 6.0'. Daily average water temperature ranged from 65 to 66°F.
- b. Daily average spill ranged from 94.7 to 96.4 kcfs.
- c. Unit Operation: **PH2** remains the priority powerhouse. Main unit drawdowns are measured every Monday and more frequently as needed.

• **Table 1. Main Unit Outages**

Unit	OOS	RTS	Reason	Duration
13	1628 on 18 Feb	---	F.O., Generator Ground	---
17	0719 on 18 Apr	1440 on 14 July	P.O., 4-Year Overhaul	87 days, 7 hours, 21 mins
12	0702 on 05 July	---	P.O., SU Panel Upgrade/Installation and Annual Overhaul	---
7	0857 on 11 July	---	P.O., 5-Year Overhaul	---
11	1415 on 11 July	1533 on 11 July	Forced For Switching	1 hour, 18 mins
14	1536 on 11 July	1703 on 11 July	Forced For Switching	1 hour, 27 mins

- d. Fish Units: Second Powerhouse Fish Units provide attraction flow for the Washington Shore (WS) fish ladder.

Fish Unit Outages: Fish Units are periodically placed into reserve service (RS) to float trash when debris differentials become excessive and trash raking is not possible.

• **Table 2. Fish Unit Outages.**

Unit	OOS/RS	RTS	Reason	Duration
F2	1142 on 28 June	---	F.O., Water in Hub	---

\*\*\*\* Single Fish Unit Ops Initiated on 28 June due to the Forced Outage of Fish Unit 2 (F2). Please see 22BON022 MFR PH2 Fish Unit 2 Outage for more details \*\*\*\*

• **Table 3. Fish Unit Drawdowns, in Feet.**

Date	F1	F2
07/10	0.8'	---
07/11	1.1'	---
07/12	0.6'	---
07/13	1.6'	---
07/15	0.3'	---
07/16	0.5'	--

**2. MAINTENANCE ACTIVITIES:**

a. Auxiliary Water System Closures:

- FV 3-9 was placed in manual for cleaning from 0906 to 0910 on 14 July.
- FV 1-1 was placed in manual for cleaning from 1344 to 1459 on 14 July.
- FV 3-7 and 3-9 were placed in manual for cleaning from 1514 to 1515 on 14 July.

b. STS/VBS Inspections: The July STS inspection results: No issues to report

UNIT	Previous STS HRS	Present readings	STS-A	STS-B	STS-C	HRS RUN	REMARKS
11	65902	66590				688	
12	50776	51275				499	
13	7950	*****				0	OOS
14	20282	20971				689	
15	27995	28686				691	
16	40409	41100				691	
17	9518	*****				0	OOS
18	11977	12667				690	

c. Dewatering and Fish Salvages:

- In the afternoon of 11 July, Fish Biologists conducted fish salvage operations in the Unit 7 (U7) scroll case. Approximately 300 juvenile salmonids, 70 adult shad, 3 smallmouth bass, 1 juvenile carp, 2 sculpin, and 1 stickleback were recovered. Approximately 25-30 juvenile salmonids and 5 adult shad mortalities occurred during this fish salvage and transportation. The fish were released at the BON NavLock due to a large group of people swimming at the Hamilton Island Boat Launch, blocking the ramp. U7 was dewatered as part of its 5-year overhaul planned outage.
- On the morning of 12 July, a Fish Biologist entered the U7 draft tube for fish salvage operations. Approximately 250 adult pacific lamprey and 1 sucker were recovered in great condition and released upstream.
- On the afternoon of 12 July, a Fish Biologist assisted in fish salvage operations for the U17 tail logs. Only 1 of the 6 tail logs was able to be removed on the 12<sup>th</sup> due to an excessive amount silt accumulated on the tail logs. Previous months' high tailwater and high flow at Bonneville are likely the cause of this excessive silt accumulation. 1 smallmouth bass and 13 sculpin were recovered in good condition and released downstream. The U17 was out of service as part of a planned 4-year overhaul.
- On 13 July, the remaining 5 tail logs from U17 were removed. Fish Biologists were able to recover 14 sculpin, 11 adult lamprey, and 76 ammocoete lamprey. This operation proved difficult as the ammocoetes were crawling deep in the many tons of silt remaining within the tail logs. 15 ammocoete lamprey mortalities were discovered under a deck plate when it was lifted off the roadway.

**3. RESEARCH:**

- a. Four Peaks Environmental - Fish counting contract: Daytime visual counting (0500 to 2100 PDT) began on 01 April. Night video counting (2100 to 0500 PDT) began on 15 May. Fish counts can be viewed [here](#).
- b. USFWS – Lamprey Metamorphosis Study: Juvenile lamprey researchers are onsite, and the work is underway.
- c. Pacific States Marine Fisheries Commission - Smolt Monitoring: Sample collections at the Smolt Monitoring Facility (SMF) began at 0700 on 02 March. Debris at the primary dewatering structure (PDS)

and fish/debris separator ranged from light to moderate consisting mostly of aquatic macrophytes, a few sticks, and dead adult American shad. 15 salmon, and 14 steelhead fallbacks were observed this week. Gas Bubble Trauma (GBT) examinations began on 12 April and are typically performed two days per week through the end of spill. Results of this week's GBT examinations: 200 sub-yearling Chinook examined: one fish (0.5%) was observed with GBT symptoms. Please follow this link <https://www.fpc.org/currentdaily/gbtsumbybatchdate.pdf> to the FPC web page for more details.

Non-salmonid GBT Monitoring was initiated at Bonneville with the start of summer spill operations. This effort is paired in conjunction with salmonid GBT monitoring with the goal of examining up to 50 non-salmonids (native and non-native species) per session using the same procedures and protocols employed in the salmonid GBT Monitoring Program. Results of this week's Non-salmonid Gas Bubble Trauma (GBT) examinations: four fish in total were examined this week; one fish was observed with GBT symptoms. Please follow this link [https://www.fpc.org/currentdaily/Summer\\_NS\\_gbtsumbybatchdate\\_realtime.pdf](https://www.fpc.org/currentdaily/Summer_NS_gbtsumbybatchdate_realtime.pdf) to the FPC web page for specific details.

For research purposes, a total of five fin clips were obtained from Pacific lamprey macrophthalmia and one from Pacific Lamprey ammocoetes for Columbia River Inter-Tribal Fish Commission's (CRITFC) genetic studies this week.

- d. USDA – Pinniped and Avian Hazing: Deck-based pinniped hazing started 14 March and concluded for the Spring season on 31 May. Avian hazing started 01 April.
- e. USGS TDG Monitoring: USGS placed TDG monitoring equipment back in service on Cascades Island above and below the Main Dam on 31 March. Water-quality data collection will continue through the end of spill season.
- f. CRITFC – Adult Salmonid Sampling: Adult salmonid sampling in the Adult Fish Facility (AFF) began on 21 April and typically occurs 5 days per week.
- g. CRITFC – Lamprey Translocation: Adult lamprey collection and translocation began on 08 June and will occur daily through 30 September.
- h. ODFW – Adult Steelhead Sampling: Steelhead sampling in the AFF began on 05 July and occurs in conjunction with CRITFC Adult Salmonid Sampling.

#### **4. FISHWAYS:**

- a. Project biologists inspected from 10 – 16 July.

b. Fish Passage Plan observations:

• **Table 4. FPP Items Out of Criteria.**

Date	Location	FPP Violation	Cause	Response
07/10 – 16	BON	Unit Priority	U13 F.O., Generator Ground	Repairs in Process
07/11	BON	Unit Priority	U5 Ran Out of Unit Priority Order in Preparation for U7 Outage	N/A
PH1				
07/10 – 16	PH1 ITS	S. End Gate Inoperable and Chain Gates 1a & 1b Closed	S. End Gate Inoperable, 1a and 1b Closed for Safety Reasons	W.O.
07/10 – 16	PH1CC	FG 2-19 Stuck in the Mostly Closed Position, Should Be Open	Mechanically Bound	W.O.
07/10,12-13	PH1CC	North Entrance/TW Diff >2.0'	FV 1-1 Not Operating Correctly	W.O.
07/10,13	PH1CC	South Entrance/TW Diff >2.0'	FV 1-1 Not Operating Correctly	W.O.
Bradford Island				
07/12,14	A-Branch	A-Branch Staff Gauge High >1.4'	Unknown	N/A
Cascades Island				
07/10 – 10	CI Fishway	FG 6-11 Mechanically Bound in the Closed Position, Should Be Open	Mechanically Bound	W.O.
07/10 – 16	Cascades Island Tailrace	1 B2CC Avian Array Line is Broken	High Tailwater Elevations	N/A
Washington Shore				
07/10 – 16	PH2CC	A2 Diffuser Stuck Mid-Travel	Unknown	W.O.
07/11	WA Shore Fishway	NDE Ent/TW Diff <1.0'	Single Fish Unit Ops	W.O. and NDE Manipulation
07/10, 11	WA Shore Fishway	PH2 Collection Channel Low Velocity	Single Fish Unit Ops	W.O. and Gate Manipulation

- PH1 Collection Channel diffuser FG 2-19 was found mechanically bound in the mostly closed position on 02/24/22 by PH1 Mechanics. No repairs can be made until the PH1CC can be dewatered in the next Oregon Fishway Winter Maintenance Period (winter 2023/2024).
- The Cascades Island Fishway diffuser FG 6-11 is mechanically bound in the closed position due to stripped shaft threads. A work order has been created and repairs will be made during the next Washington Shore/Cascades Island Fishway Winter Maintenance Period (winter 2022/2023).

c. Adult Fishways:

- (1) The AFF remains in service.
- (2) Sensor calibrations were conducted on 14 July.
- (3) SLEDs are installed at all locations.
- (4) Bradford Island, Cascades Island, and Washington Shore Fishways remain in service and are in “Shad Mode” due to current fish passage numbers.

d. Juvenile Fishways:

- (1) The ITS remains in service (auto-chain gates 3B, 6C, & 10B only).
- (2) The hydro-cannon remains in service.
- (3) The B2CC remains in service.
- (4) The DSM remains in service.
- (5) STSs remain in service.

e. Lamprey Fishways:

- (1) BI, CI, and WA Shore LPS's remain in service.
- (2) The Bradford Island Wetted Wall (BIWW) remains out of service.
- (3) The PH2 Lamprey Flume Structure (LFS) remains out of service for the year.
- (4) The AFF lamprey trap and CI lamprey trap both remain in service.
- (5) Avian Monitoring: Avian counts are recorded 01 April – 31 October.

**Table 5.** *Avian Counts 10 – 16 July.*

<b>Date</b>	<b>Gulls</b>	<b>Cormorants</b>	<b>Terns</b>	<b>Wh. Pelicans</b>	<b>Grebes</b>
07/10	2	9	0	0	0
07/11	1	1	0	0	0
07/12	2	17	0	0	0
07/13	7	3	0	0	0
07/14	4	4	0	0	0
07/15	2	6	0	0	0
07/16	1	4	0	0	0

**5. WATER QUALITY MONITORING:**

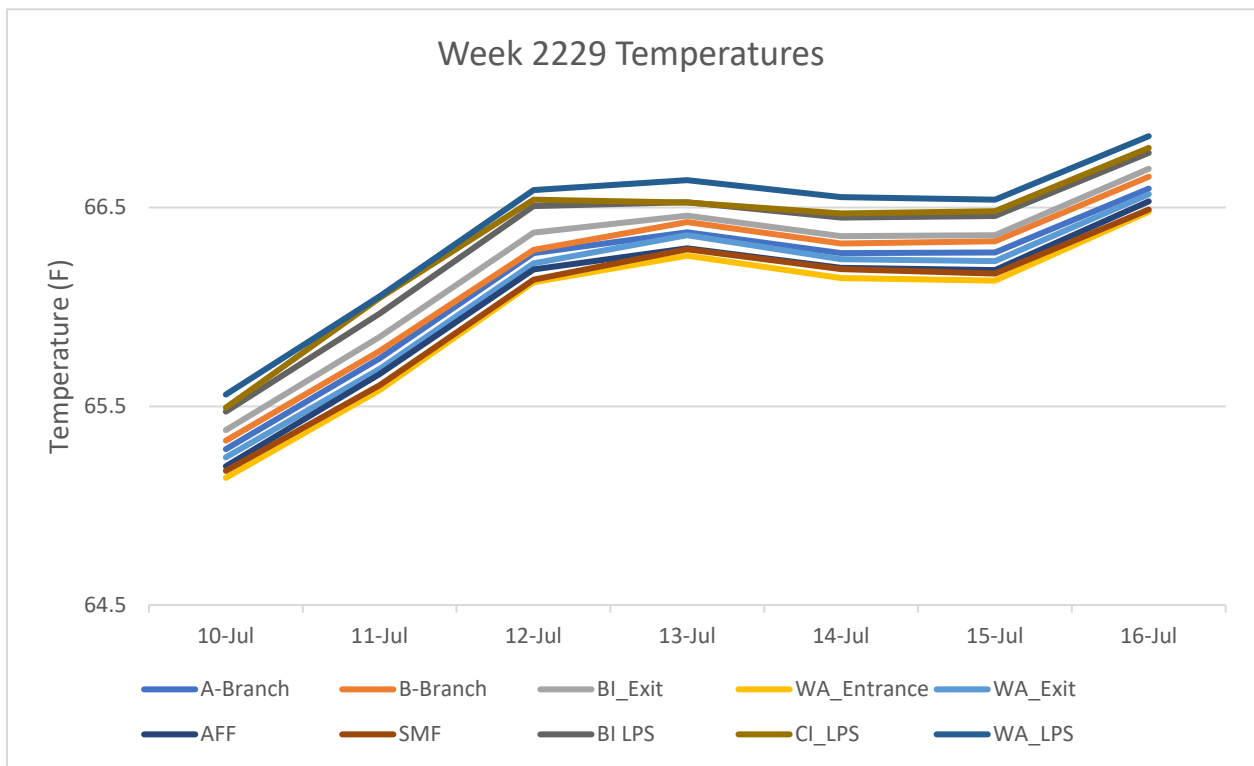
a. Fishway Temperatures: Fishway temperature monitoring is currently underway.

**Table 6.** Fishway Temperatures for 10 to 16 July at Bonneville Lock & Dam.

Date	A-Branch	B-Branch	BI_Exit	WA_Entrance	WA_Exit	CI_Entrance	AFF	SMF	BI_LPS	CI_LPS	WA_LPS	LFS
10-Jul	65.3	65.3	65.4	65.1	65.2		65.2	65.2	65.5	65.5	65.6	OOS
11-Jul	65.7	65.8	65.8	65.6	65.7		65.7	65.6	66.0	66.0	66.1	OOS
12-Jul	66.3	66.3	66.4	66.1	66.2		66.2	66.1	66.5	66.5	66.6	OOS
13-Jul	66.4	66.4	66.5	66.3	66.4		66.3	66.3	66.5	66.5	66.6	OOS
14-Jul	66.3	66.3	66.4	66.1	66.2		66.2	66.2	66.4	66.5	66.6	OOS
15-Jul	66.3	66.3	66.4	66.1	66.2		66.2	66.2	66.5	66.5	66.5	OOS
16-Jul	66.6	66.7	66.7	66.5	66.6		66.5	66.5	66.8	66.8	66.9	OOS

\*\* The Cascade Island Entrance probe is currently unserviceable.

\*\* The LFS was taken out of service on 16 June.



**Figure 1.** Average fishway temperatures for 10 to 16 July at Bonneville Lock & Dam.

b. Zebra Mussel Monitoring: No signs of colonization were observed this reporting week.

**6. CONSTRUCTION:** Nothing to report.

**7. HAZMAT, SPILLS AND CLEANUP:** Nothing to report.

## 8. TELETYPES CURRENTLY IN EFFECT:

- A teletype was sent 30 June regarding the Bonneville Forebay operations for treaty fishery. This operation includes Bonneville Pool operating within a 1.5-foot band, hard constraint for the periods listed below:
  - From 0600 Monday, 04 July to 1800 Friday, 08 July 2022
  - From 0600 Monday, 11 July to 1800 Friday, 15 July 2022

The goal of this operation is to limit pool fluctuation to avoid debris in fishing nets, reduce rapid water drops that may entangle nets, minimize boat access problems, and avoid nets being torn from their anchors. Please see teletype BON R 063022 1252 for more details

- A teletype was sent on 14 July regarding the Bonneville Forebay operations for treaty fishery. This operation includes Bonneville Pool operating within a 1.5-foot band, hard constraint for the periods listed below:
  - From 0600 Monday, 18 July to 1800 Thursday, 21 July 2022
  - From 0600 Monday, 25 July to 1800 Thursday, 28 July 2022

The goal of this operation is to limit pool fluctuation to avoid debris in fishing nets, reduce rapid water drops that may entangle nets, minimize boat access problems, and avoid nets being torn from their anchors. Please see teletype BON R 071422 1059 for more details

- A teletype was sent on 13 June detailing Summer Spill Operations for fish passage at Bonneville Lock & Dam. Effective Thursday 16 June at 0001 HRS, through Wednesday August 31 at 2359 HRS, operate Bonneville Dam in accordance with the 2022 Fish Operations Plan (FOP) to provide Summer Spill for fish passage as described below:
  - Pursuant to FOP Table 4, the 2022 Summer Spill Operation at Bonneville Dam is as follows:
    - June 16 at 0001 HRS to August 14 at 2359 HRS: Target Spill = 95 kcfs
    - August 15 at 0001 HRS to August 31 at 2359 HRS: Target Spill = 50 kcfs
  - Distribute spill according to spill patterns in the 2022 Fish Passage Plan (FPP) Table BON-16. Follow the pattern spill rate that is closest to the target. Actual spill may range +/-3 kcfs from the target from the target due to Project operational limitations.
  - Continue to operate the Powerhouse 2 Corner Collector (B2CC) throughout Summer Spill, then close B2CC within one hour of the end of spill on 31 August. B2CC operating criteria are found in the FPP Section 2.3.2.5.v.
  - Maintain spill at the FOP target as long as it does not exceed the spill cap in Level 1 of the most recent Spill Priority List Teletype. Do not spill above the Level 1 Spill Cap except as required during involuntary spill, pursuant to the Spill Priority List Teletype.
  - If river flow is too low to maintain FOP spill and minimum generation requirements in FOP Table 1, operate at minimum generation and spill the remainder of outflow.
    - During periods of low flow, it may be necessary to operate outside the minimum operation range defined in FOP Table 1 in order to maintain reserves for transmission reliability, as defined below.
  - If notified that BPA has declared a “Transmission System Reliability Need” or “Transmission System Emergency”, adjust operations as instructed by BPA Hydro Scheduling or Transmission Dispatch (per FOP Section 4.4).  
Please see Teletype BON R 061322 0955 for more details.

- A teletype was sent on 18 July updating the Spill Priority List and is to be used until further notice. The teletype outlines maximum spill level estimated not to exceed the applicable TDG water quality standard and lack of load spill levels and order to which should be spilled. Please see teletype BON R 071822 1314 for more details.

- A teletype was distributed on 06 July outlining a high forebay operation for Bonneville Dam. This operation will be occurring Wednesday, July 13, from 0900 to 1500 HRS and consists of the following constraints:

Hard Constraint: 75.0 to 76.5 feet

Soft Constraint: 75.5 to 76.5 feet

The forebay constraint request is to operate as close as possible to 76.5 feet. The goal of this operation is to evaluate hydraulic conditions of the Washington Shore Auxiliary Water System (AWS) at the upper limit

of the Bonneville Dam Forebay operating range. At this time there are concerns associated with the performance of the AWS at the upper limit of the forebay operating range and this high forebay operation may inform any future actions needed to ensure effective operation of the AWS. Please see teletype BON R 070622 0700 for more details.

- A teletype was sent on 20 July regarding a second high forebay operation for Bonneville Dam. Effective Friday, July 22, from 0900 to 1500 hours, the following forebay operation will be implemented at Bonneville:

Hard Constraint: 75.5 to 77.0 feet

Soft Constraint: 76.0 to 77.0 feet

The intent of this operation is to have the forebay as high as possible for a 1-hour period within the specified time above. Once this operation is complete, Bonneville will return to its normal forebay operating range: 71.5 to 76.5 feet. The goal of this operation is to evaluate hydraulic conditions of the Washington Shore Auxiliary Water Supply (AWS) at the upper limit of the Bonneville Dam forebay operating range. At this time there are concerns associated with the performance of the AWS at the upper limit of the forebay operating range and this high forebay operation may inform of any future actions needed to ensure effective operation of the AWS. Please see teletype BON R 072022 0909 for further details.

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