

MEMORANDUM FOR Biologist, Operations Division (CENWP-OD)

SUBJECT: Bonneville Lock & Dam, Fishway and Fish Activities for Week 29 of 2023, which covers the period from 16 to 22 July 2023.

1. OPERATION SUMMARY:

- a. Daily average river flows ranged from 127.6 to 156.0 kcfs. Daily average powerhouse forebay elevation ranged from 74.5' to 75.7' msl. Daily average project tailwater ranged from 11.4' to 13.5' msl. Secchi disk measurements ranged from 6.0 to 7.0+'. Daily average water temperature ranged from 70 to 71°F.
- b. Daily average spill ranged from 84.2 to 96.1 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
4	1631 on 29 Mar	---	F.O., Oil Leak Investigation/5-YR Overhaul	---
3	1105 on 12 Jun	---	F.O., Oil Leaks	---
14	0735 on 20 Jun	---	P.O., FGE Gatewell Improvement/Annual Overhaul/QTCI	---
15	0729 on 10 Jul	---	P.O., 4-Year Overhaul	---
11	0904 on 19 Jul	1037 on 19 Jul	P.O., Trash Raking	1 hour, 33 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 paced 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
F1	2300 on 15 Jul	0532 on 16 Jul	R.S., Nighttime Lamprey Ops	6 hours, 32 mins
F2	2256 on 16 Jul	0529 on 17 Jul	R.S., Nighttime Lamprey Ops	6 hours, 33 mins
F1	2259 on 17 Jul	0550 on 18 Jul	R.S., Nighttime Lamprey Ops	6 hours, 51 mins
F2	2259 on 18 Jul	0529 on 19 Jul	R.S., Nighttime Lamprey Ops	6 hours, 30 mins
F1	2259 on 19 Jul	0530 on 20 Jul	R.S., Nighttime Lamprey Ops	6 hours, 31 mins
F2	2257 on 20 Jul	0529 on 21 Jul	R.S., Nighttime Lamprey Ops	6 hours, 32 mins
F2	2300 on 21 Jul	0530 on 22 Jul	R.S., Nighttime Lamprey Ops	6 hours, 30 mins
F1	2300 on 22 Jul	---	R.S., Nighttime Lamprey Ops	---

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

Date	F1	F2
07/16	0.7'	1.7'
07/17	0.4'	0.7'
07/18	0.3'	1.7'
07/19	0.6'	0.9'
07/20	0.2'	4.2'
07/21	0.3'	1.0'
07/22	0.5'	0.4'

2. MAINTENANCE ACTIVITIES:

- Auxiliary Water System Closures:
 - FV 6-9 was placed into manual for cleaning from 0720 to 0730 on 20 July.
- STS/VBS Inspections: Nothing to report.
- Dewatering and Fish Salvages: Nothing to report.

3. RESEARCH

- 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](#).
- USFWS – Lamprey Metamorphosis Study: Juvenile lamprey researchers are onsite and the work is underway.
- 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 was light consisting mostly of aquatic macrophytes, a few sticks, and dead adult American shad. No fallbacks were observed this week.
Higher temperature sampling protocols were initiated on 15 July (sample end-date of 16 July) when daily average river temperatures at Bonneville ascended to 70°F. Modified sampling during higher temperatures means Index/Condition sampling will take place every other day until the average descends to 69.5°F. Sample and bypass mode will occur on alternating 20-hour periods (0700-0700).
Gas Bubble Trauma (GBT) examinations began on 10 April and are typically performed two days per week through the end of spill. However, due to current higher river temperatures, GBT monitoring was reduced to once per week. Results of this week’s GBT examinations: 100 subyearling Chinook examined with no GBT symptoms observed. Please follow this link <https://www.fpc.org/currentdaily/gbtsumbybatchdate.pdf> to the FPC web page for further 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. Non-salmonid GBT exams only occur when TDG levels are above 110% and water temperatures are below 68°F. No GBT exams were performed on non-salmonids this week as river temperatures were above the 68°F threshold. Please follow this link https://www.fpc.org/currentdaily/Summer_NS_gbtsumbybatchdate_realtime.pdf to the FPC web page for specific details.
A total of two fin clips were obtained from Pacific Lamprey macrophthalmia for Columbia River Inter-Tribal Fish Commission’s genetic studies this week.
- USDA – Pinniped and Avian Hazing: Deck-based avian hazing operations are underway.

- e. USGS TDG Monitoring: USGS placed TDG monitoring equipment back in service on Cascades Island above and below the Main Dam on 04 April. 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 19 April and typically occurs 5 days per week.
- g. CRITFC – Lamprey Translocation: Adult lamprey collection and translocation began on 05 June.

4. FISHWAYS:

- a. Project Biologists inspected 16 to 22 July.
- b. Fish Passage Plan observations:

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

Date	Location	FPP Violation	Cause	Response
PH1				
07/16 – 22	PH1 ITS	S. End Gate Inoperable and Chain Gates 1b Closed	S. End Gate Inoperable, 1b Closed for Safety Reasons	W.O.
07/16 – 22	PH1CC	FG 2-19 Stuck in the Mostly Closed Position, Should Be Open	Mechanically Bound	W.O.
Bradford Island				
07/16,19,20	A-Branch	A-Branch Staff Gauge High >1.1’	Unknown	N/A
Cascades Island				
07/16 – 18	CI Fishway	FG 6-6 Open, Should be Closed	Electrical Failure	W.O.
07/16 – 18	CI Fishway	FG 6-7 Partially Open, Should be Closed	Electrical Failure	W.O.
07/16 – 18	CI Fishway	FG 6-8 Open, Should be Closed	Electrical Failure	W.O.
07/16 – 18	CI Fishway	FG 6-10 Open, Should be Closed	Electrical Failure	W.O.
07/21,22	CI Fishway	FG 6-18 Open, Should be Closed	Mechanically Bound	W.O.
Washington Shore				
07/16 – 20, 22	WA Shore Fishway	Weir 37 High >1.1’	Investigation Underway	W.O.
07/17	WA Shore Fishway	Weir 38 High >1.1	Investigation Underway	W.O.

- 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 full dewater of the Cascades Island Fishway.
- Cascades Island Fishway diffuser FG 6-12 is mechanically bound in the open position for unknown reasons. A work order has been created and repairs will be made during the next full dewater of the

Cascades Island Fishway.

- Cascades Island Fishway diffuser FG 6-18 was found stuck in the open position with limiter problems in the fall of 2022. A work order has been created and repairs have been attempted, but full repair requires complete dewatering of the fishway. These repairs will be made during the next full dewater of the Cascades Island Fishway.

c. Adult Fishways:

- (1) The AFF remains in service.
- (2) Sensor calibration checks occurred on 17 July.
- (3) SLEDs are installed at all locations.
- (4) Bradford Island, Cascades Island, and Washington Shore Fishways remain in service and were returned to salmon mode on 11 July.

d. Juvenile Fishways:

- (1) The ITS remains in service.
 - Auto-chain gates 3B, 6C, & 10B remain operational.
 - Mechanical-chain gate 1A was opened on 10 January 2023 to increase downstream surface passage and reduce trash raking workloads on the FV 1-1 trash racks. For safety measures, an additional (7th) trash rack was installed in the 1A gate slot, extending the height of stacked trash racks to approx. +80' el. Without the 7th trash rack, the existing 6 trash racks extend from the river floor (approx. -2' el) to +68' el. This additional trash rack provides a safety barrier to block accidental sluiceway entry of a person, vessel, or other undesirable object floating uncontrollably downstream.
- (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) is in service.
- (3) The PH2 Lamprey Flume Structure (LFS) remains out of service.
- (4) The AFF Lamprey Trap and Cascades Island Lamprey Trap remain in service.
- (5) Avian Monitoring: Avian counts are recorded 01 April – 31 October.

Table 5. Avian Counts for 16 – 22 July.

Date	Gulls	Cormorants	Terns	Wh. Pelicans	Grebes
07/16	6	3	0	0	0
07/17	1	2	0	0	0
07/18	3	10	0	0	0
07/19	21	1	0	0	0
07/20	1	2	0	0	0
07/21	9	4	0	0	0
07/22	3	1	0	0	0

5. WATER QUALITY MONITORING:

- a. Fishway Temperatures: The fishway temperature monitoring system at Bonneville was halted temporarily due to a failure of equipment. New equipment was purchased and the probes were re-deployed on 19 Aug. Please see 23BON049 MFR Bonneville Dam Temperature Monitoring System Failure for further details regarding the monitoring system failure. Temperature monitoring and reporting was active again on 18/19 August.

Table 6. Daily Average Fishway Temperatures for 16 to 22 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
16-Jul	---	---	---	---	---	---	---	---	---	---	---
17-Jul	---	---	---	---	---	---	---	---	---	---	---
18-Jul	---	71.7	---	---	---	---	---	---	---	72.0	---
19-Jul	71.8	71.6	72.2	71.7	71.9	---	71.8	71.6	72.3	71.9	72.2
20-Jul	71.6	71.5	71.7	71.4	71.5	---	71.5	71.4	71.9	71.6	71.8
21-Jul	71.5	71.6	71.7	71.5	71.6	---	71.5	71.4	71.8	71.7	71.8
22-Jul	72.0	72.1	72.2	72.0	72.2	---	72.1	72.0	72.4	72.3	72.4

*The Cascades Island Entrance probe is currently unserviceable.

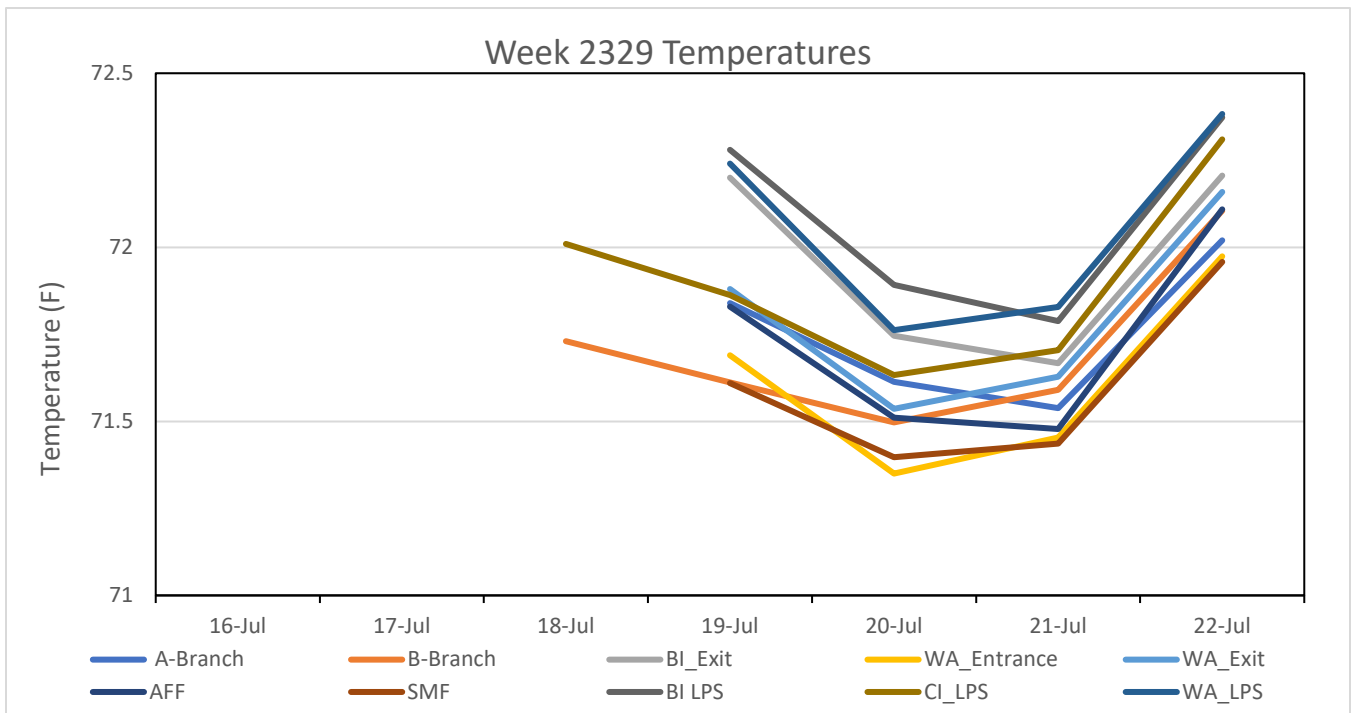


Figure 1. Average Fishway Temperatures for 16 to 22 July at Bonneville Lock & Dam

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

7. CONSTRUCTION:

- FGE modification work on U14 gatewells is currently underway.

8. HAZMAT, SPILLS AND CLEANUP: Nothing to report.

9. TELETYPES CURRENTLY IN EFFECT:

- A teletype was distributed on 15 June updates Summer Spill Caps. Effective 0001 hours on June 16, operate Bonneville Dam in accordance with table listed in teletype BON R 061523 0839. Per the FOP (Level 1) spill to 140kcfs, levels beyond that cap spill at 150kcfs.
- A teletype was distributed on 12 June regarding FOP Summer Spill for fish passage. Effective 16 June through 31 August, operate Bonneville Dam in accordance with the 2023 Fish Operations Plan (FOP) to provide summer spill for fish passage, as described below.
 - Pursuant to FOP Table 4, the 2023 Summer Spill operation at Bonneville Dam is as follows:
 - 16 June, 0001 HRS – 14 August, 2359 HRS: Spill 95 kcfs, 24 HRS/DAY
 - 15 August, 0001 HRS – 31 August, 2359 HRS: Spill 50 kcfs, 24 HRS/DAY
 - Distribute spill according to spill patterns in the 2023 Fish Passage Plan (FPP) Table BON-16. Follow the spill pattern that is closest to the intended spill rate. Actual spill may vary up to +/- 3 kcfs from the target due to Project operational limitations described in the FOP sections 3 and 8.8.3.
 - Continue to operate the Powerhouse 2 Corner Collector (B2CC) throughout Summer Spill, then close the B2CC within one hour of the end of spill on 31 August. B2CC operating criteria are defined in FPP Section 2.3.2.5.v (Page BON-20).
 - 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 forced 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. This operation supports power system reliability during low flows.
 - During periods of low flow, it may be necessary to operate outside of the minimum generation 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).
 - If the adjustment results in a deviation from the FOP target spill level, or results in operating outside of the minimum generation requirements in the FOP Table 1, describe details of the event in the Project Operator Logbook and provide to RCC upon request for reporting requirements.

Please see teletype BON R 061223 1145 for details.

- A teletype was distributed on 14 July regarding a Bonneville high pool operation. The request was for BPA to make best effort to operate the Bonneville Forebay above 75.5 ft, soft constraint, on 17 July from 1000 to 1800 HRS. The purpose of this operation was to help create favorable conditions for the Big Air Kiteboard Event being held in Hood River, OR. Please see teletype BON R 071423 1215 for further details.

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