

**OFFICIAL COORDINATION REQUEST FOR
NON-ROUTINE OPERATIONS AND MAINTENANCE**

COORDINATION TITLE- 22BON009 MOC T11 BPA Outage

COORDINATION DATE- 05/04/2022

PROJECT- Bonneville Lock & Dam

RESPONSE DATE- 05/18/2022

Description of the problem:

Bonneville Power Administration (BPA) requires an outage at Bonneville Lock & Dam’s Powerhouse Two (PH2) on T11 (Main Units 11-14) to replace relays for the North Bonneville – BON 230 KV Line #3. This is non-routine work requiring attention as soon as possible to avoid a catastrophic failure of this line.

This work will be started on 18 July and continue through 05 August 2022 and will require Units 11, 12, 13, and 14 to remain Out of Service (OOS) for the duration of work. The outage was coordinated for the specified timeframe with the intention of minimizing impacts on fish (**Tables 1, 2, 3 and 4**), while addressing critical maintenance in a timely manner to avoid a catastrophic failure, which could potentially require a more time and cost intensive outage.

*This work was originally slated for 27 June to 15 July but was moved to this later date after discussions with FPOM representatives concerned with the timing of the outage and juvenile fish passage.

Type of outage required: The T11 outage will take four units (U11-14) OOS.

Impact on facility operation (FPP deviations):

This operation requires the outage of Main Units 11-14. During the specified dates, the Washington Shore Fishway ladder will remain within FPP operation criteria along with all other Bonneville fishway ladders. Unit priority will deviate from FPP section 4.1.1. The spillway and Powerhouse Two Corner Collector (B2CC) will remain in service according to FPP guidance for Summer Spill through 31 August. Fish Units 1 and 2 will remain in service during this outage. If the remaining serviceable PH2 and PH1 main units reach max capacity, increased spill may be implemented with coordination with RCC and BPA to compensate for excess river inflow. 10-year average outflow at BON can be found below (**Figure 1**).

Impact on unit priority: Starting 18 July, unit priority will be impacted due to the T11 outage:

Current FPP Unit Priority Order Criteria (BON 4.1, Table BON-13):

PH2: 11, 18, 12, 17, 13, 14, 15, 16

PH1: 1, 10, 3, 6, 9, 4, 5, 8, 7, 2

During T11 Outage:

PH2: 18, 17, 15, 16

PH1: 1, 10, 3, 6, 9, 4, 5, 8, 7, 2

Impact on forebay/tailwater operation: None

Impact on spill: None, the spillway will remain in service through 31 August, per FPP summer spill criteria. The B2CC will also be open through the entirety of the outage.

Dates of impacts/repairs: 18 July to 05 August

Length of time for repairs: 19 days

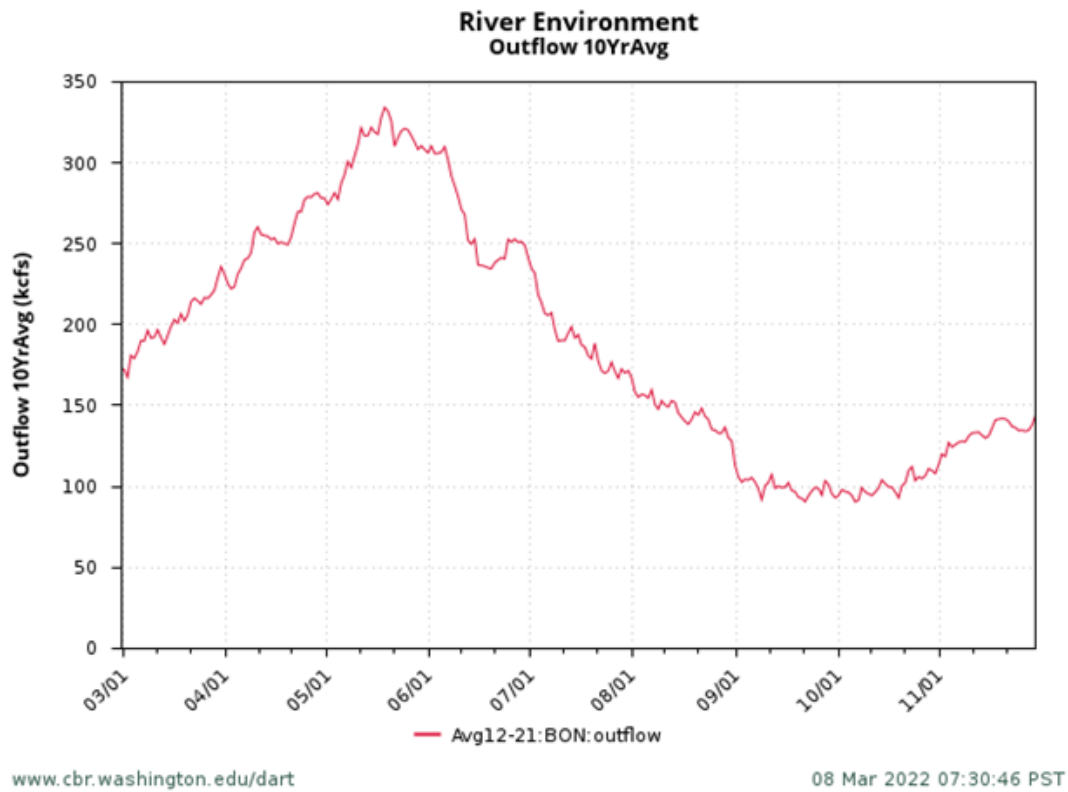


Figure 1. 10-year average outflow data during fish passage season at Bonneville. (Obtained from Columbia Basin Research, DART)

Analysis of potential impacts to fish

1. 10-year average passage by run during the period of impact for adults and juvenile listed species, as appropriate for the proposed action and time of year:

2021 fish passage and 10-year average fish passage data (Obtained from Columbia Basin Research, DART):

Table 1. BON 2021 Passage Data for Chinook, Steelhead, Sockeye, Lamprey, and Shad.

Date	Chinook 2021	Jack Chinook 2021	Steelhead 2021	Sockeye 2021	Lamprey 2021	Shad 2021
18-Jul	538	116	386	744	271	924
19-Jul	580	149	365	554	566	822
20-Jul	569	126	637	394	322	672
21-Jul	553	107	592	328	525	619
22-Jul	501	88	506	253	257	720
23-Jul	389	62	424	213	262	904
24-Jul	431	62	504	166	237	825
25-Jul	404	93	511	127	297	662
26-Jul	422	95	539	138	267	898
27-Jul	389	85	466	133	298	1211
28-Jul	301	60	435	124	157	928
29-Jul	220	41	342	106	141	521
30-Jul	227	38	351	92	184	631
31-Jul	273	79	373	81	91	461
1-Aug	213	72	331	74	182	414
2-Aug	139	47	304	57	347	501
3-Aug	131	23	192	55	278	354
4-Aug	235	42	317	64	220	396
5-Aug	382	71	532	46	100	248

Table 2. BON 10-Year Average Passage Data for Chinook, Steelhead, Sockeye, Lamprey, and Shad.

Date	Chinook 10-Yr Avg	Jack Chinook 10-Yr Avg	Steelhead 10-Yr Avg	Sockeye 10-Yr Avg	Lamprey 10-Yr Avg	Shad 10-Yr Avg
18-Jul	785	149	1781	1029	549	2679
19-Jul	758	148	1729	852	467	2064
20-Jul	805	143	1911	766	485	1819
21-Jul	684	149	1894	643	517	1592
22-Jul	686	147	2107	561	499	1422
23-Jul	610	141	2105	481	449	973
24-Jul	612	129	2365	378	531	837
25-Jul	619	131	2546	317	479	842
26-Jul	660	142	2885	279	484	824
27-Jul	620	151	3037	234	525	562
28-Jul	652	164	3179	191	468	584
29-Jul	675	142	3040	159	466	541
30-Jul	642	131	3415	122	440	463
31-Jul	543	116	3255	99	415	502
1-Aug	522	118	3553	86	376	524
2-Aug	479	112	3191	66	421	581
3-Aug	445	96	2994	56	304	517
4-Aug	438	99	2813	53	338	386
5-Aug	504	95	2857	53	359	395

Table 3. BON 2021 Smolt Passage Index.

Date	Sub-yearling Chinook 2021	Yearling Chinook 2021	Smolt Coho 2021	Smolt Sockeye 2021	Smolt Steelhead 2021
18-Jul					
19-Jul	10685				
20-Jul					
21-Jul	2207				
22-Jul					
23-Jul	635				
24-Jul					
25-Jul	158				
26-Jul					
27-Jul	700				41
28-Jul					
29-Jul	2007				
30-Jul					
31-Jul	293				
1-Aug					
2-Aug	99				
3-Aug					
4-Aug	116				
5-Aug					

Note: This is a passage index dataset derived by the Smolt Monitoring Program

Table 4. BON 10-Year Average Smolt Passage Index.

Date	Sub-yearling Chinook 10-Yr Avg	Yearling Chinook 10-Yr Avg	Smolt Coho 10-Yr Avg	Smolt Sockeye 10-Yr Avg	Smolt Steelhead 10-Yr Avg
18-Jul	38311	0	0	0	3
19-Jul	32990	18	0	0	0
20-Jul	45872	0	0	5	0
21-Jul	32046	84	74	131	0
22-Jul	43491	3	29	60	0
23-Jul	23998	0	8	60	20
24-Jul	38306	0	0	7	3
25-Jul	3027	0	0	24	0
26-Jul	30404	0	0	0	0
27-Jul	30461	0	0	131	14
28-Jul	15375	86	0	55	0
29-Jul	14527	0	0	28	0
30-Jul	12102	0	0	58	0
31-Jul	8650	0	0	50	0
1-Aug	11904	0	0	90	0
2-Aug	10130	34	0	0	0
3-Aug	9899	0	0	94	0
4-Aug	2616	0	0	0	0
5-Aug	7990	18	0	26	0

Note: This is a passage index dataset derived by the Smolt Monitoring program.

2. Statement about the current year’s run (e.g., higher or lower than 10-year average):

Table 4. Run Prediction Forecasts Obtained From WDFW.

Chinook	Similar to last year’s actual return
Sockeye	Below 10-year average
Coho	Above 10-year average
Steelhead	Below 10-year average

3. Estimated exposure to impact by species and age class (i.e., number or percentage of run exposed to an impact by the action):

Table 5. 10-Year Average Totals for Outage Timeframe vs 10-Year Average Run Totals. (Obtained from Columbia Basin Research, DART)

Species	07/18 – 08/05 10-Year Average	10-Year Total Run Average	Percentage of Run Affected
Chinook	11,739	713,940	1.6%
Jack Chinook	2,503	101,809	2.5%
Steelhead	50,657	173,666	29.2%
Sockeye	6,425	300,663	2.1%
Lamprey	8,572	35,493	24.2%
Shad	18,107	4,041,274	0.4%
Sub-Yearling Chinook	412,099	3,923,838	10.5%
Yearling Chinook	243	2,018,064	0.01%
Smolt Coho	110	611,959	0.02%
Smolt Sockeye	816	419,772	0.2%
Smolt Steelhead	40	515,180	0%

4. Type of impact by species and age class (increased delay, exposure to predation, exposure to a route of higher injury/mortality rate, exposure to higher TDG, etc.):

With Unit 11 OOS, there will be no unit attraction flow for the south entrances of the Washington Shore Fishway, increasing the difficulty for fish to locate the south entrances. However, Fish Unit 1 and Fish Unit 2 will remain in service during this outage and will create appropriate fish ladder entrance differentials according to FPP criteria (BON 2.4.2.4) at each Washington Shore Fishway entrance.

Upstream migrating fish may be more attracted to the north entrances of the Washington Shore Fishway as well as the Cascades Island Fishway and Bradford Island Fishway. Fish that are delayed in finding the south monolith entrances may be at an increased risk of sea lion predation. However, sea lion abundance is relatively low during the summer months and historically have remained below the sea lion monitoring trigger during this work period (van der Leeuw & Tidwell, 2022).

With Units 11-14 OOS, there will be no attraction flow to the B2CC entrance and the submersible traveling screens (STSs) associated with these units will be non-operational during this outage, possibly delaying downstream migration. This delay could leave juvenile fish more vulnerable to

avian predators in the PH2 forebay. However, the Ice and Trash Sluiceway (ITS) at PH1, spillway, and B2CC will still be operational during this period for downstream passage.

Summary statement - expected impacts on:

Downstream migrants: The population of downstream migrants that is most likely to be impacted are the sub-yearling Chinook. Using 10-year averages, 10.5% of the total run of sub-yearling Chinook passage occurs from 18 July to 05 August. All other potential impacts to downstream migrant species populations are projected as minimal. (**Table 5**)

Upstream migrants (including Bull Trout): The impact is expected to be greatest on the upstream migration of steelhead, accounting for 29.2% of the 10-year total run averages (**Table 5**). However, all Bonneville Lock & Dam fishway ladders are scheduled to be fully operational during this time.

Lamprey: Possible. Using 10-year averages, about 24.2% of lamprey migration traditionally occurs during the timeframe of this outage (**Table 5**). It should be noted; the lamprey numbers included in this data only includes window counts at Bradford Island and Washington Shore. Lampreys that use the south shore fishway entrances may experience delays finding the entrances with no unit attraction flow. However, all fishway entrances will maintain proper differentials and all Lamprey Passage Structures (LPS) will be fully functional at this time.

Comments from agencies

220414 FPOM Draft Agenda:

[Apr 22] **BPA BON outage. ACTION:** Bettin will inquire about moving outage to 15 July. Mackey commented that MOCs should be produced for outages that affect priority units for situational awareness and the opportunity to comment.

- Response from BPA: 25APR22 – BPA changes date of outage from 27Jun-15Jul22 to 18Jul-05Aug22.

220512 FPOM Draft Minutes

NWP

22BON009 MOC T11 BPA Outage -No comments. Review period up on 5/18.

Final coordination results

The outage will proceed as scheduled on 18 Jul - 05 August 2022.

After Action update

Please email or call with questions or concerns.

Thank you,

Tammy Mackey

NWP Operations Division Fishery Section – Chief

Tammy.M.Mackey@usace.army.mil

Patricia Madson

Columbia River Coordinator (acting)

Patricia.L.Madson@usace.army.mil