

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

**COORDINATION TITLE-** 23BON006 update MOC B-Branch Erosion Repair In-Water Work Extension

**COORDINATION DATE-** 13 March 2023

**PROJECT-** Bonneville Lock & Dam

**RESPONSE DATE-** 15 March 2023

**Description of the problem**

USACE is requesting an additional two-week extension to the already extended in-water work window to support installation of additional stone necessary to repair the failed riprap revetment in Bonneville's spillway, adjacent to the fish ladder. This extension will allow for the procurement and placement of an additional 1200 CY (3000 tons) of rock to protect the bank around the fish ladder. Failure to complete this work could result in modified spill patterns for the juvenile fish passage season.

Bays 1 and 18 will resume normal operation until the contractor is able to return to the spillway to complete the work.

On 15 September 2022, after flushing trash through Spillbays 1 & 18, project personnel observed erosion on the riprap apron of the B-Branch Fish Ladder on the south shore of the spillway tailrace (**Photo 1**). This erosion was further confirmed by an ROV, hydrosurvey, and land survey (as coordinated in *22BON089 MOC & MFR 22BON094 & 23BON005*). The erosion undermines the structural integrity of the ladder. The repairs on the riprap will begin 19 February 2023. Failure to repair may result in having to close the B-Branch ladder to avoid structural failure and modify spill for juvenile fish passage in April 2023. The contractor needs a two-week extension of the in-water work period to complete the repairs.



**Photo 1:** Left frame, close photo of damage to the B-Branch Fish Ladder apron. Right frame, overall photo of the damage. Photo obtained from MOC 22BON089.

**Type of outage required** – B-Branch Fish Ladder will not be dewatered; however, the spillway (bays 2-18) will be on sill and B-Branch fish valves FV4-3 and FV4-4 will be closed.

**Impact on facility operation** - If this emergency repair cannot be completed, there is a risk that continued erosion at the B-Branch fishway bank could ultimately lead to structural failure of the

B-Branch fishway, resulting in the closure of the fishway and changes to spillway operations impacting both adult upstream migration and juvenile migrants moving downstream.

Deviation from Section 2.2.4.4. *Regarding spillbay attraction flow adjacent operating ladder entrance.* Spillbay 18 cannot be open for attraction flow to B-Branch for the duration of repairs due to the barge located at the erosion site.

Deviation from Section 2.3.1.2. *Regarding avian lines.* Avian lines in the spillway tailrace will have to be uninstalled for duration of repairs to allow for barge crane use. Lines will be reinstalled once work is completed.

Deviation from Section 2.4.2.4. *Maintain head on all entrances, 1.5' preferred.* The B-Branch entrance head will be well below 1' with FV4-3 and FV4-4 being closed to permit spud barge securing for repairs.

**Impact on unit priority-** None, repairs to the B-Branch erosion site will not have impacts to unit priority. Powerhouse 1 is the priority powerhouse during Bonneville 2022/2023 winter maintenance and the in-water-work period. Once the Washington Shore fishways are watered up, the priority powerhouse will be Powerhouse 2. If the river inflow exceeds the hydraulic capacity of both powerhouses, BON must release discharge through the spillway causing a disruption to the contractor and evacuation of the worksite.

**Impact on forebay/tailwater operation** – B-Branch erosion repairs may impact tailwater operations for redd protection at Ives/Pierce Island. Bay 1 will operate 24 hours a day and could contribute to increased TDG.

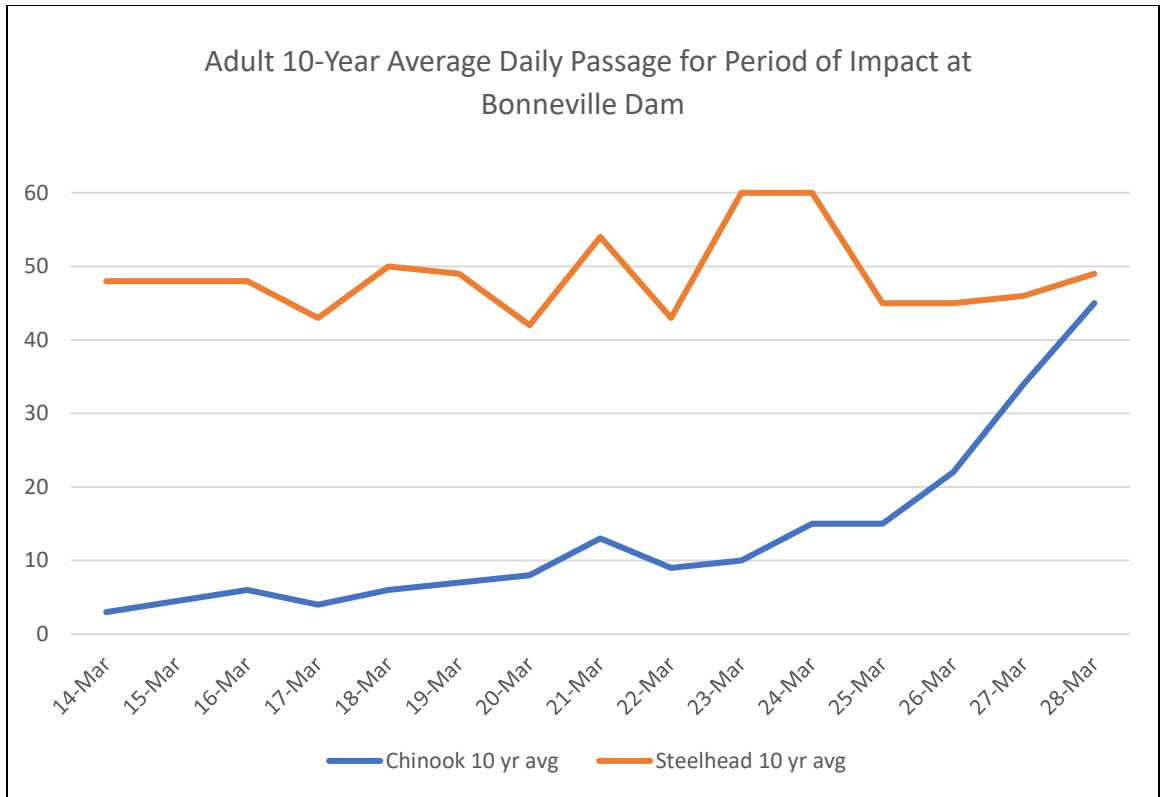
**Impact on spill** – Spill season starts 10 April. Bays 2-18 must be closed and on sill while the contractor is in the inner boat restricted zone (BRZ) of the spillway tailrace. Any discharge that exceeds the hydraulic capacity of both powerhouses will require BON to involuntary spill. Involuntary spill will require the contractor to evacuate the work site and the modified involuntary spill pattern must be followed as previously coordinated in *MOC 22BON096 BON Modified Involuntary Spill Patterns*.

**Dates of impacts/repairs** – 14 March – 31 March 2023.

**Length of time for repairs** – With contractors working 24/7, about 14 additional days. Bonneville will attempt to return the spillway and fish valves to service earlier, if feasible.

#### **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;**



**Figure 1** is the 10-year average (2013-2022) daily passage of adult Chinook and steelhead at Bonneville Dam during dates of impact between 14-28 March that are potentially exposed to the impacts of the B-Branch erosion repair. Data obtained from Columbia River DART daily adult query for Bonneville Dam,

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

- The 2022 spring Chinook run was higher than the 10-year average total spring Chinook run. The 2023 spring Chinook run is predicted to be higher than the 10-year average spring Chinook run.
- 2022 total steelhead run was lower than the 10-year average total steelhead run

Data obtained for current year and 10-year average run comparison from Columbia River DART (2022) daily adult query for Bonneville Dam.

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

- Percent run of adult steelhead exposed to impact 0.7%
- Percent run of adult spring Chinook exposed to impact 0.2%

Estimated exposure to impact by species was found by dividing 10-year average cumulative passage for dates of impact, divided by 10-year average total passage, multiplied by 100. Data was obtained from Columbia River DART (2022) using adult daily query for Bonneville Dam.

**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.);**

We expect upstream migrants in the spillway tailrace to be more attracted to the fully operational Cascades Island fishway which will also have adjacent spillbay attraction flow by operating Gate 1 to be open to 1 stop (0.5'). In addition to Cascades Island fishway being fully operational, all powerhouse fish ladder entrances will maintain proper FPP required entrance head differentials.

Any upstream migrants that are near the B-Branch fishway entrance may experience an increased delay in locating the operating B-Branch fish ladder entrance. This is because the B-Branch erosion repair requires little to no flow in the worksite area for barge access. The barge restrictions include no auxiliary water flow from the B-Branch fish valves which decreases head differential at the B-Branch entrances, and no adjacent spillbay attraction flow from Spillbay 18. The delay in locating the B-Branch Fish Ladder entrances will increase exposure to predators such as sea lions. However, this exposure is expected to be minimal since other fully operational ladders with proper attraction outflow will be open at both powerhouses and Cascades Island during the two week in-water work extension.

Adult downstream migrants are not expected to experience an increase delay to passage or predation due to repairs. Main unit turbines, Ice and Trash Sluiceway (ITS), Powerhouse 2 Downstream Migrant Channel (DSM2) and B2 Corner Collector (B2CC) will all be available for downstream passage during the updated extension request.

Juvenile downstream passage during the repair is low, as most juvenile passage occurs with spring and summer spill. As previously mentioned, the ITS will be available for downstream passage. Starting March 1, the DSM2 and the B2CC are also available for use. Spillbay 1 will be open one stop and would be an additional route that juveniles can use.

**Summary statement - expected impacts on:**

**Upstream migrants (including Bull Trout)**

Impacts are expected to be minimal since A-Branch, Cascades Island, and Washington shore fishways will be operating per FPP criteria during this timeframe. It is noted that upstream migrants that choose to use B-Branch may experience an increased delay and become more susceptible to predation. Pinniped abundance is typically low during this time of year and therein, potential predation exposure is minimal.

**Downstream migrants**

Expected impacts to downstream migrants are minimal. While the contractor is in the spillway tailrace, no involuntary spill may occur for the safety of the barge personnel and equipment. Out migrants can use main unit passage, DSM2, Spillbay 1, or surface flow outlets. However, we expect the repair impact to be minimal since downstream passage numbers are low during the repair dates.

**Lamprey**

Impacts to adult lamprey are expected to be minimal. Using the 10-year average, 95% of the run for adult lamprey has passed by the end of August, with the last passage day

average occurring on November 17 (Columbia River DART, 2022). Adult lamprey that are in the spillway tailrace searching for the B-Branch entrance may experience a slight delay due to the reduced ladder attraction flow and lack of entrance head differential. However, the reduced flow at B-Branch may act as an advantage for adult lamprey that enter the fishway since the typical FPP required head differential of 1.5 ft can be a hinderance to upstream lamprey movement (Keefer et al. 2012).

Expected impacts to juvenile lamprey are minimal. Out migrants will have main unit passage, DSM2, and surface flow routes available. If involuntary spill occurs during the erosion repair timeframe, the operating spillbays will provide additional downstream passage routes for juvenile lamprey.

**Updated MOC comments –**

-----Original Message-----

From: Mackey, Tammy M CIV USARMY CENWP (USA)

Sent: Friday, March 10, 2023 2:34 PM

Subject: FPOM: draft coordination - two week extension for B-Branch

A more complete MOC will be sent on Monday, we are still working on the fish numbers and impacts.

NWP is seeking concurrence for an additional two-week extension to the already extended in-water work window to support installation of additional stone necessary to repair the failed riprap revetment in Bonneville's spillway, adjacent to the fish ladder. This extension will allow for the procurement and placement of an additional 1200 CY (3000 tons) of rock to protect the bank around the fish ladder.

If funding is not secured, the two week extension is moot but we will need to discuss and coordinate a modified spill pattern to ensure the safety of the partially completed repair. More information will be available next week, I just want to get this to you for your thoughts as soon as possible.

Aside from the obvious fact that we are in fish passage season and not meeting FPP criteria, do you have other, specific concerns we should address in a MOC before it goes to the entire region?

Please let me know of any concerns or comments before noon on Monday, if you can.

I apologize for the short turn-around. Keep your fingers crossed we get the funding though so this issue can be dealt with.

Sincerely,  
Tammy

**CRITFC - -----Original Message-----**

From: Tom Lorz <lorz@critfc.org>

Sent: Tuesday, March 14, 2023 9:35 AM

Subject: [Non-DoD Source] Re: FPOM: Official Coordination -

I appreciate the need to get this work done, however this work can not and should not impact our ability to implement spill and make sure the spillway is ready ie avian lines. It is troubling that this work was not started much sooner in the winter work period to insure this work could be completed in a timely manor and not impact fish mitigation actions that are clearly outlined in the

Proposed Action and BiOp. We would request an after action report when the work is complete to find ways to insure this does not occur again. I am also greatly troubled that somehow there was not enough rock to complete to work and we are now scrambling to find funds and rocks. This seems to have been a serious oversight by someone who estimated the amount of rock needed and the cause for this type of error needs to be understood to make sure it does not happen again, or I can purchase the COE or contractor a 2022 geometry hand book to aid in volume calculations.

We look forward to an update prior to the next FPOM meeting

Tom Lorz  
CRITFC

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**Comments from agencies – for original two week extension.**

CRITFC - -----Original Message-----

From: Mackey, Tammy M CIV USARMY CENWP (USA)

Sent: Wednesday, February 22, 2023 1:49 PM

To: Tom Lorz <[lorz@critfc.org](mailto:lorz@critfc.org)>; [trevor.conder@noaa.gov](mailto:trevor.conder@noaa.gov)

Cc: Cates, Rebecca I CIV USARMY CENWP (USA) <[Rebecca.I.Cates@usace.army.mil](mailto:Rebecca.I.Cates@usace.army.mil)>

Subject: RE: FPOM: Official Coordination - 23BON006 MOC B-Branch erosion repair IWW extension - DUE 27 February

Yes, we were intending to complete the work within the IWW. We are going to extend beyond that winter maintenance season.

This work did not start sooner because there was a delay in contract award and thus contractor mobilization.

The contractor is expected to work 24/7 after initial assessment and surveys are completed this week.

Your concerns are understood and shared.

Tammy

-----Original Message-----

From: Tom Lorz <[lorz@critfc.org](mailto:lorz@critfc.org)>

Sent: Wednesday, February 22, 2023 1:26 PM

To: Mackey, Tammy M CIV USARMY CENWP (USA) <[Tammy.M.Mackey@usace.army.mil](mailto:Tammy.M.Mackey@usace.army.mil)>; [trevor.conder@noaa.gov](mailto:trevor.conder@noaa.gov)

Subject: [Non-DoD Source] Re: FPOM: Official Coordination - 23BON006 MOC B-Branch erosion repair IWW extension - DUE 27 February

Ok just getting back to this one. This work needs to be completed as soon as possible. It looks like this will delay the return of B branch and spillway attraction spill during the repair period. Anything to move this forward as quick as possible is desirable. Was I wrong in that I thought this work was to be completed during the in water work period (ie the end of Feb) and it seems that it is going to extend past? What led to this delay and why did this work not start sooner since we had all winter maintenance to complete this. Given that this work needs to be completed prior to the start of spill all efforts should be made to complete this work as quickly as possible.

Thank you

Tom Lorz  
CRITFC

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**NOAA Fisheries –**

-----Original Message-----

From: Trevor Conder - NOAA Federal <trevor.conder@noaa.gov>

Sent: Wednesday, February 22, 2023 1:52 PM

To: Mackey, Tammy M CIV USARMY CENWP (USA)

Subject: [Non-DoD Source] Re: FW: FPOM: Official Coordination - 23BON006 MOC B-Branch erosion repair IWW extension - DUE 27 February

I support this work and stress getting it done as soon as possible which I believe is the intent. There appears to be an error in the Moc that references 1.5 fps as a hindrance to lamprey. Normal ladder entrance velocity is much higher velocity than 1.5fps. Maybe the authors meant 1.5ft of differential?

**Final coordination results**

The B-Branch Erosion Team informed the contractor they have an additional two weeks (until 14 March) to complete the work. RCC issued a teletype instructing the opening of Bay1 to provide attraction flow for Cascades Island fishway.

Updated results - The hydro-surveys were completed the week of 19 March and the contractor will return to the spillway on 27 March. Rock placement is expected to be completed by 31 March and final hydro-surveys completed the first week of April. BON Project will have avian lines replaced prior to the start of spill on 10 April.

**After Action update –**

Please email or call with questions or concerns.

Thank you,

**Tammy Mackey**

NWP Operations Division Fishery Section

503-961-5733

Tammy.m.mackey@usace.army.mil

**Becca Cates**

Fisheries Biologist

U.S. Army Corps of Engineers

Rebecca.i.cates@usace.army.mil

## **Citations**

### **Bonneville adult passage data obtained from:**

#### **DART Data Citation**

Columbia River DART, Columbia Basin Research, University of Washington. (2022). Adult Passage Daily Counts. Available from [https://www.cbr.washington.edu/dart/query/adult\\_daily](https://www.cbr.washington.edu/dart/query/adult_daily)

### **Bonneville FPP criteria obtained from:**

U.S. Army Corps of Engineers. (2022). Final 2022 fish passage plan (FPP) Chapter 2 – Bonneville Dam. Fish Passage Operations and Maintenance (FPOM). Retrieved November 21, 2022, from <https://pweb.crohms.org/tmt/documents/fpp/2022/>

Keefer, M., T. Clabough, M. Jepson, E. Johnson, C. Boggs, and C. Caudill, 2012. Adult Pacific Lamprey

Passage: Data Synthesis and Fishway Improvement Prioritization Tools. Technical Report 2012-8 of University of Idaho to U.S. Army Corps of Engineers, Portland, OR.