

OFFICIAL COORDINATION REQUEST FOR NON-ROUTINE OPERATIONS AND MAINTENANCE

COORDINATION TITLE – 23 IHR 06 Fish Release Pipe Install Outage and Unit 3 Turbine Testing

COORDINATION DATE – 08/2/2023

PROJECT- Ice Harbor Dam

RESPONSE DATE – 08/16/2023

Description of the problem: Biological testing for the new Unit 3 at Ice Harbor Dam is scheduled from September 20 – October 25, 2023. Biological testing will involve release of tagged and sensor fish into the turbine intake via pipe attached to the STS supports (Figures 1 and 2). Installation and removal of the fish release pipe will require removing Unit 3 from operation for 2 to 3 days. We propose the installation to occur late September or early October. During removal of the pipes after the Unit 2 test in 2019, we discovered a U-bolt had broken and the pipe bent between installation and pipe removal. For safety, pipes will be removed after the conclusion of the Unit 3 evaluation. Also, part of this MOC is to request a deviation from unit priority in order to operate Unit 3 during the biological testing if flow only allows operation of a single unit (Figure 3).

Type of outage required

Turbine Outages– Unit 3 outage is estimated to be from 0700-1800 each day for 2 to 3 days during fish release pipe installation, September 18-19, 2023; then 0700-1800 each day for 2 to 3 days during fish release pipe removal after the biological testing, after November 2022.

Impact on facility operation (FPP deviations)

Remove Unit 3 from operation for 2 to 3 days in mid-September and again in early to mid-November for pipe installation and removal (FPP, Chapter 6, Table IHR-4). The wide date range is requested to allow flexibility with project operations. Operate Unit 3 out of priority if needed during evaluation period.

Impact on unit priority –

During the biological testing, we are requesting unit priority change from Unit 2 to Unit 3 (Unit 1 is out of operation for rehab) if flows only allow operation of a single unit. The Project will coordinate outages and unit test operations with BPA/RCC.

Impact on forebay/tailwater operation – During the biological testing, we are requesting as close to 96 ft of gross head as possible or a forebay elevation to be between 437.0 – 438.0 ft (these values are within the normal operating range listed in the 2023 Fish Operations Plan). Computational Fluid Dynamic models and physical models of the new unit were run at 96 ft of gross head and running the study at the near the same elevation will provide comparability to the models.

Impact on spill – There is no anticipated impact on spill operations.

Dates of impacts/repairs

- 1) Fish release pipe install = 2-3 day period sometime during the week of 18-22 September 2023.
- 2) Unit 3 operating priority for testing = 20 September-25 October 2023.
- 3) Fish release pipe removal = 2-3 day period before the 15th November 2023.

Length of time for repairs

Unit 3 outage is estimated to be out of operation for 2 to 3 days each for fish release pipe installation and removal. A unit priority change to operate and test Unit 3 up to 30 days is also requested. Additional days may be needed depending on flow conditions and study progress.

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;
 - i. On average, 13,375 Chinook salmon, 50,437 steelhead and 5,851 Coho salmon pass Ice Harbor Dam 18 September to 25 October
2. Statement about the current year's run (e.g., higher or lower than 10-year average);
 - a. Adult Chinook and coho salmon returns for 2023 are expected to be near the 10-year average. Adult steelhead are expected to be below the 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);
 - a. Approximately 14% of Chinook salmon (Figure 4), 59% of adult steelhead (Figure 5), and 75% of adult coho salmon will pass Ice Harbor Dam from September 18 to October 25, and a rare adult sockeye salmon (Figure 6) may pass during this time period, according to the 10-year average (DART 2023).
 - b. Bull trout passage is unknown during the outage and study period. The study will occur during the optimal bull trout spawning window which will reduce the likelihood of bull trout being in the vicinity of Ice Harbor Dam. The chances of a bull trout migrating downstream increase later in October as some adults migrate back into mainstem rivers to overwinter.
 - c. Approximately 5% of adult lamprey passing Ice Harbor Dam may pass during the study period according to the 10-year average (Figure 7).
 - d. Very few juvenile fish are expected to pass the project during this time period. The 10-year average at Lower Monumental Dam suggests numbers in the low 100's or less across species per day would be passing the Ice Harbor during this time (Figure 8).
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.);

- a. Change in unit priority, if needed, may cause some passage delay for adult salmon and steelhead. Trumbo et al. (2014) found no difference of biological significance in adult passage at the Ice Harbor Dam south fishway relative to turbine Unit 1 or Unit 3 operating singly, which suggests that any of units 1-3 operating singly would provide adequate attraction flow for the south fishway and would produce minimal delay. Adult bull trout and lamprey migrating upstream are also expected to be minimally affected.
- b. Change in unit priority, if needed, should have minimal impact to juvenile salmon passage.

Summary statement - expected impacts on:

Downstream migrants

Minimal impact

Upstream migrants (including Bull Trout)

Minimal impact.

Lamprey

Minimal impact.

Comments from agencies

Final coordination results

After action update

Please email or call with questions or concerns. Thank you,

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References:

Trumbo BA, MK Shutters, JF Renholds, ML Ahmann and KE Crum. 2014. Ice Harbor Test Turbine Fixed Blade Runner Installation Considerations for Adult Salmonid Passage. Report of the US Army Corps of Engineers, Walla Walla District, Walla Walla, Washington.

DART (Data Acquisition in Real Time). 2023. Adult Passage Graphics & Text. Columbia Basin Research, University of Washington, Seattle, Washington. Available at: http://www.cbr.washington.edu/dart/query/adult_graph_text. 17 July June 2023.

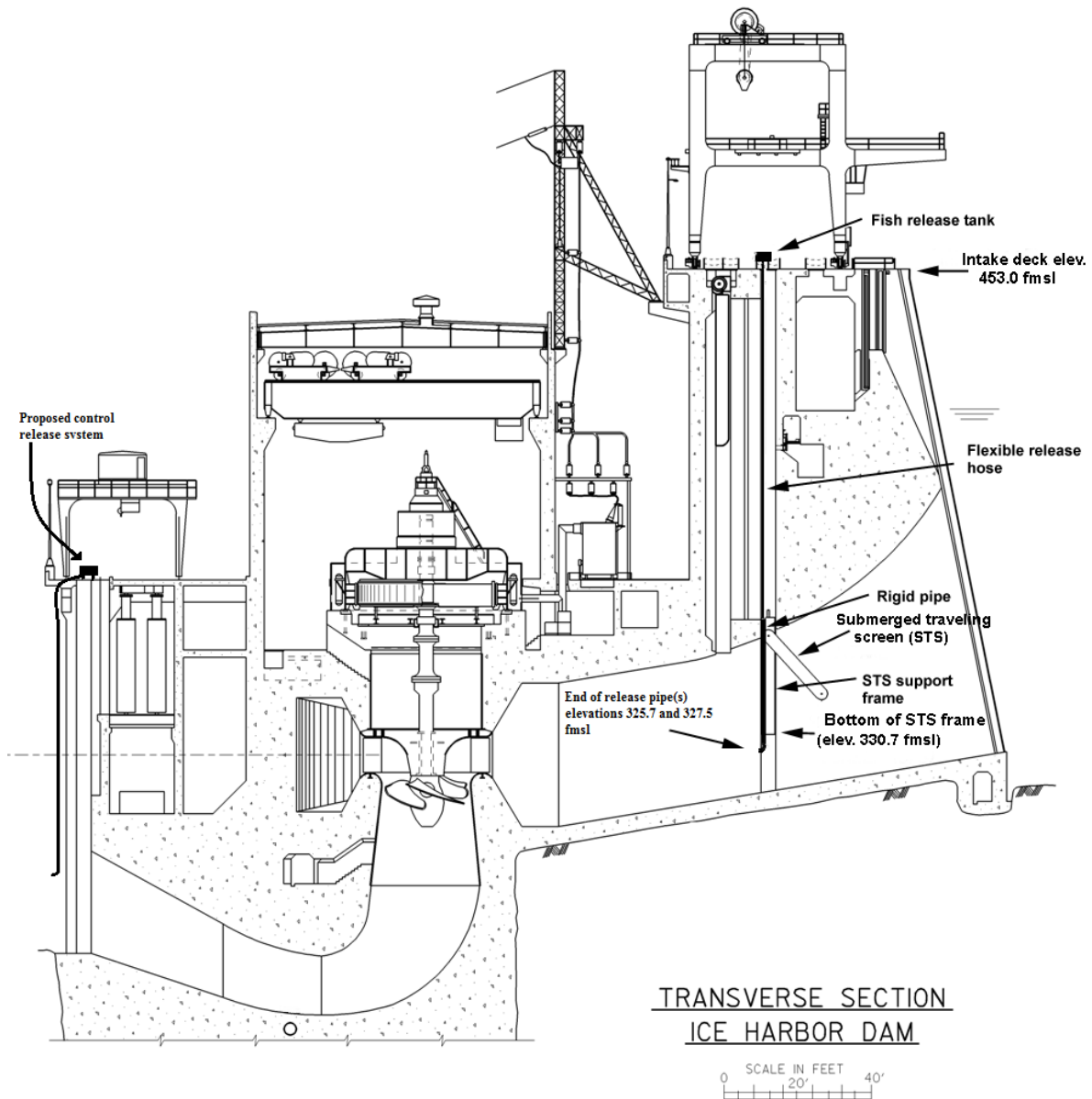
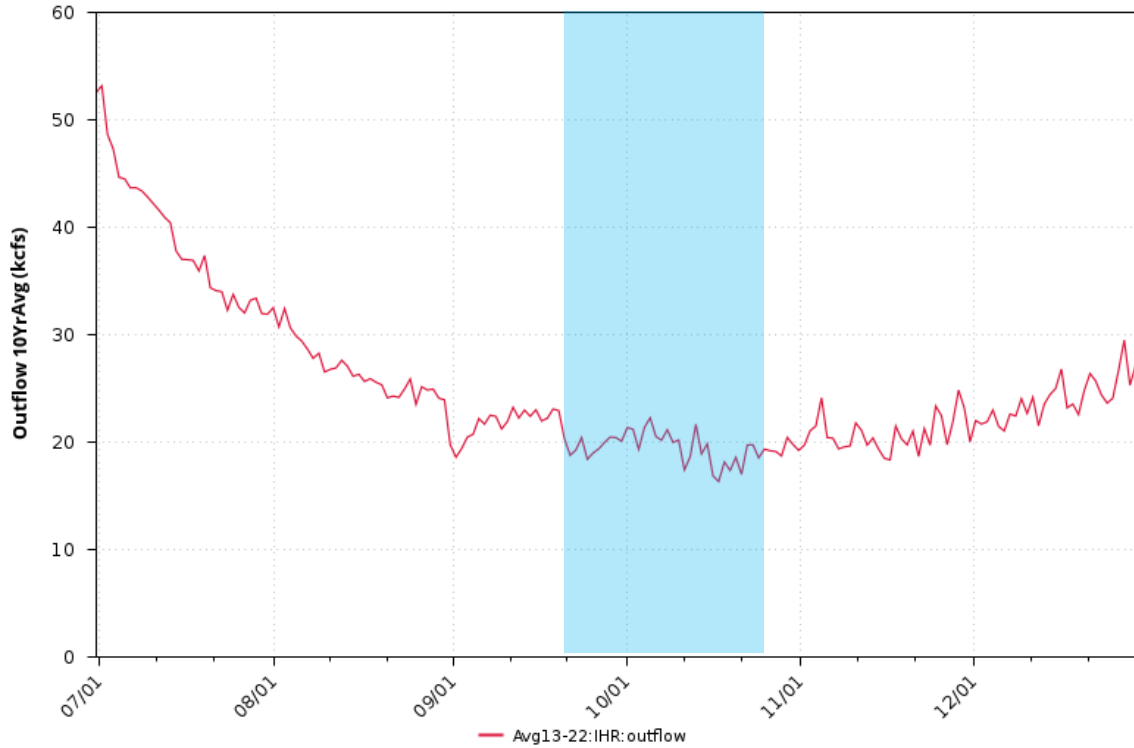


Figure 1: Cross-section of powerhouse and turbine showing the 2007 and proposed treatment release locations for juvenile Chinook salmon at Ice Harbor. Control fish will be released just downstream of the exit from the draft tube. Source U.S. Army Corps of Engineers.



Figure 2: Planned fish release pipes design and method of attachment to traveling fish screen frame (top left photo) 30 inches off-center toward the north. Normandeau recommends that pipe design and installation (provided by Corp) follow that utilized previously in the 2007 study. The exit end of release pipes were curved (top right photo) and oriented in a downstream direction when installed. Normandeau will provide the same type of induction system and release hoses (bottom photo) used in 2007.

River Environment Outflow 10YrAvg



www.cbr.washington.edu/dart

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Figure

3. 10-year average outflow at Ice Harbor Dam during the outage and study period (DART).

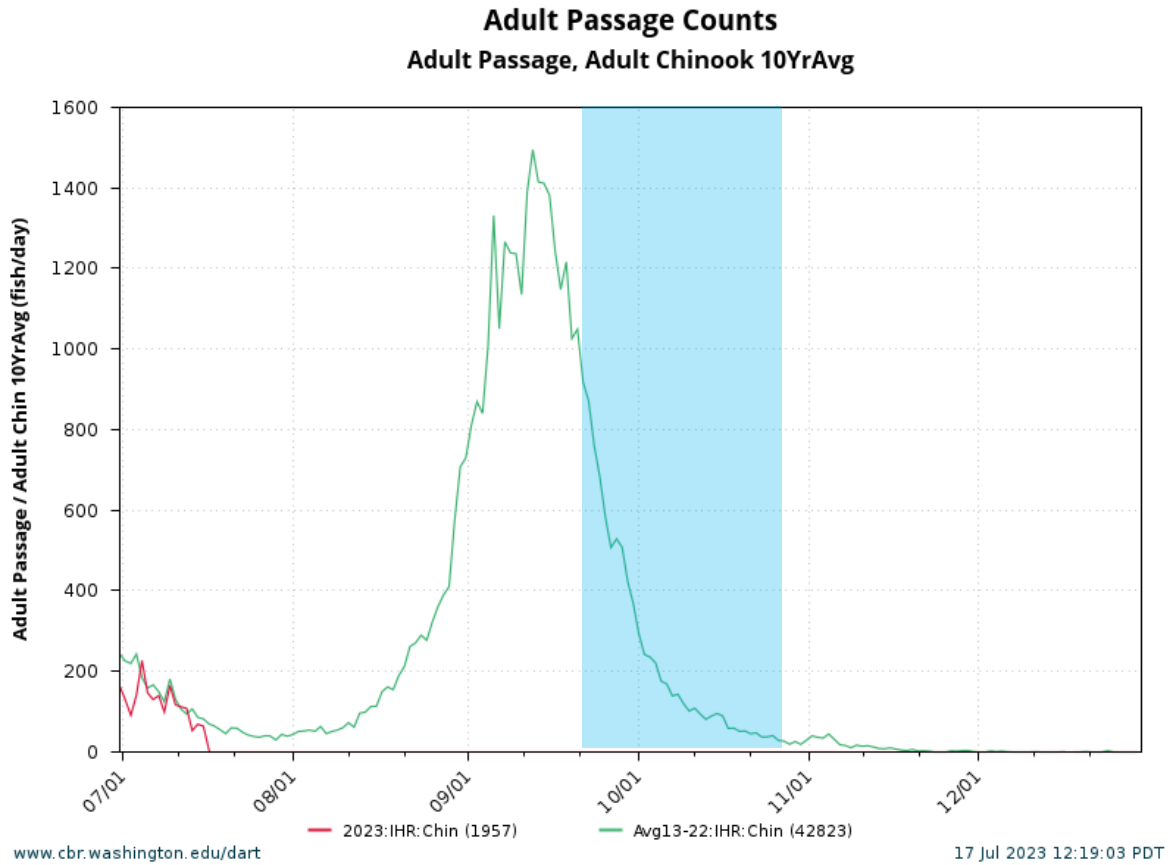


Figure 4. 10-year average adult fall Chinook salmon passage at Ice Harbor Dam during the outage and study period (DART). The blue shaded area is the approximate study window.

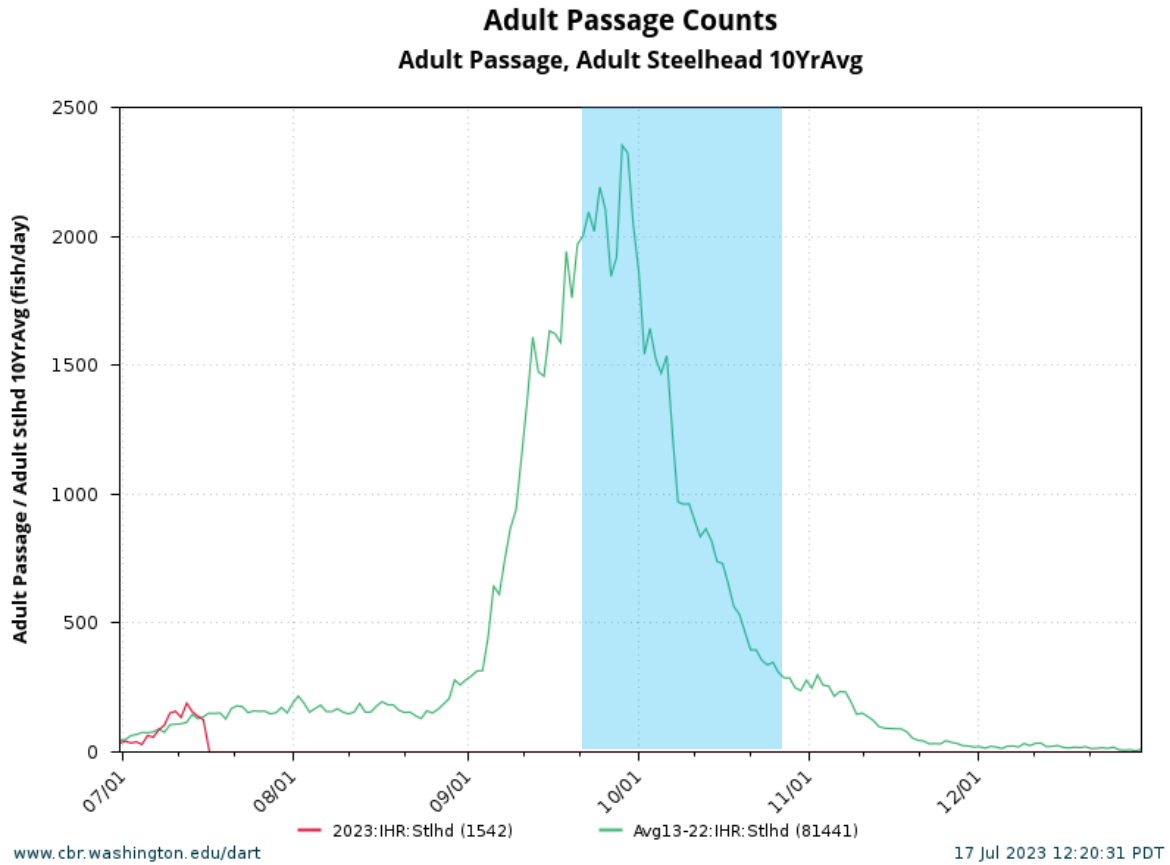


Figure 5. 10-year average adult steelhead passage at Ice Harbor Dam during the outage and study period (DART). The blue shaded area is the approximate study window.

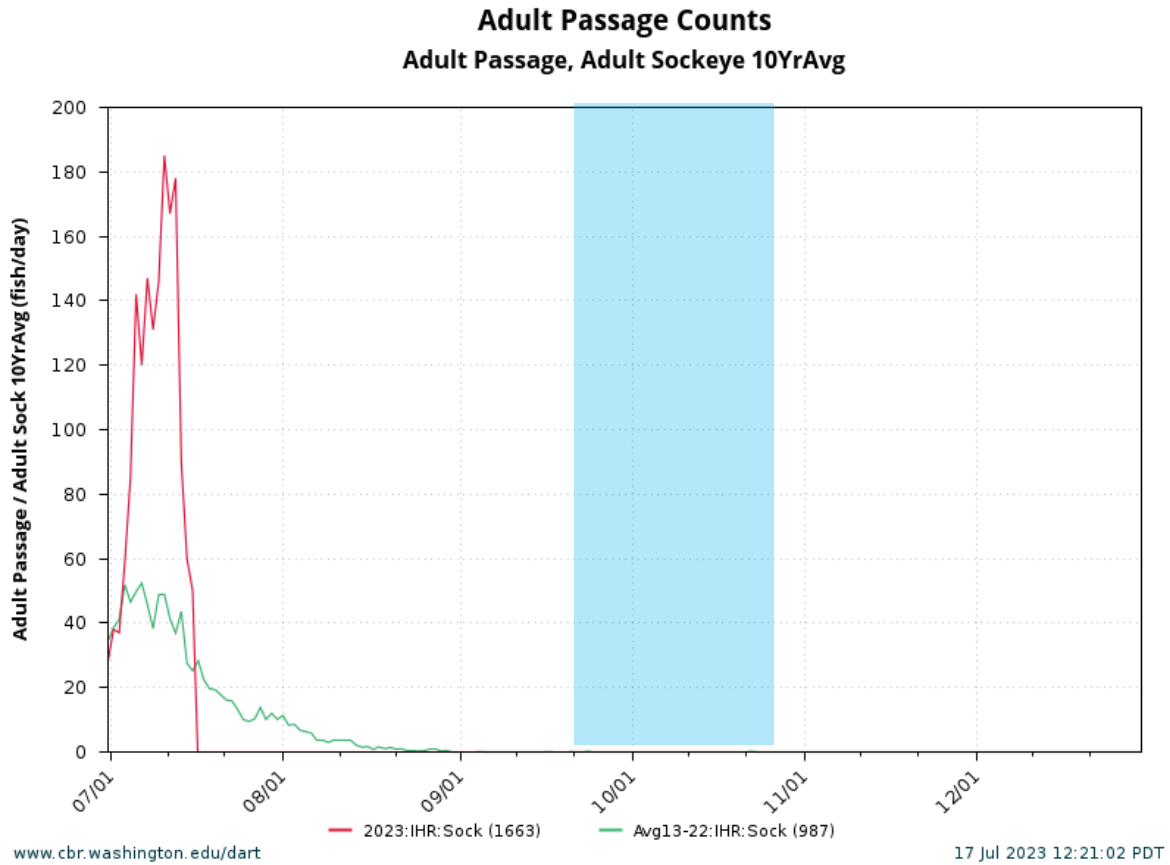


Figure 6. 10-year average adult sockeye passage at Ice Harbor Dam during the outage and study period (DART). The blue shaded area is the approximate study window.

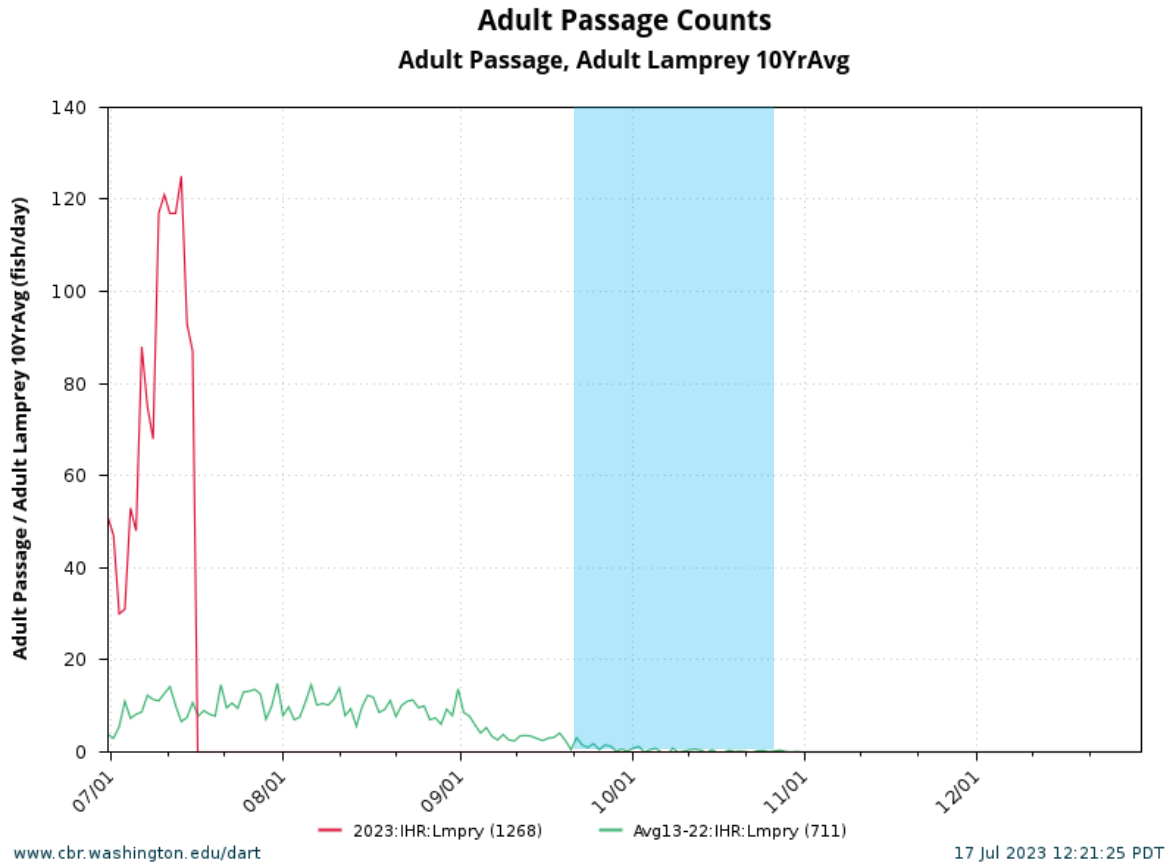


Figure 7. 10-year average adult lamprey passage at Ice Harbor Dam during the outage and study period (DART). The blue shaded area is the approximate study window.

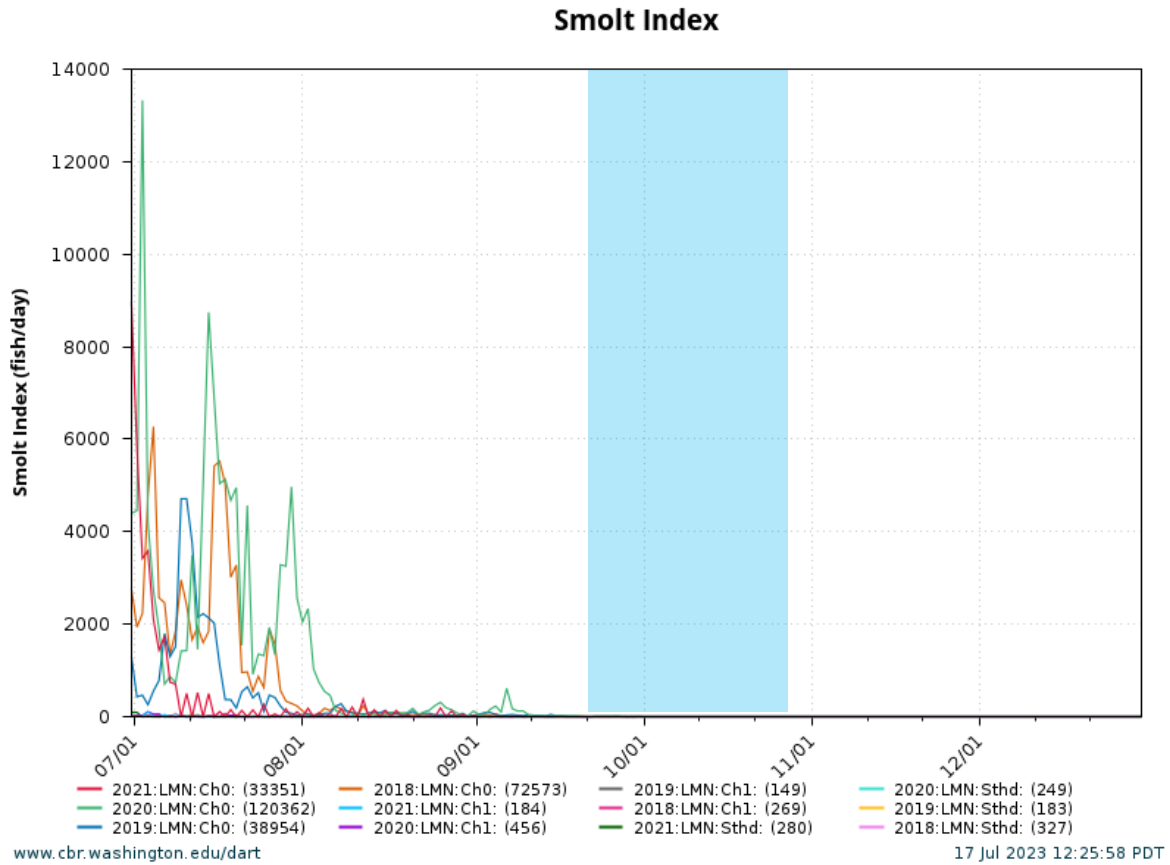


Figure 8. 10-year average juvenile passage at Lower Monumental and Little Goose dams during the outage and study period. Passage numbers are not estimated after October 1 at Lower Monumental Dam or after November 1 at Little Goose Dam. The blue shaded area is the approximate study window.