

OFFICIAL COORDINATION REQUEST FOR NON-ROUTINE OPERATIONS AND MAINTENANCE

COORDINATION TITLE– 2020 IHR 04 MOC - JBS Early Shutdown for Maintenance

COORDINATION DATE - May 8, 2020

PROJECT- Ice Harbor Dam

RESPONSE DATE - May 22, 2020

Description of the problem

There are several upgrade/repair projects in the works for machinery and operating systems associated with juvenile bypass system (JBS). The intake gantry crane is a critical piece of equipment used to deploy submersible traveling screens (STSs), handle intake gates and maintenance bulkheads, and clear debris from the penstock intake trash racks. The intake gantry crane was constructed in 1994, and is in need of an upgrade to the operating control system, which is now obsolete. Should the control system fail, replacement parts would be difficult or impossible to obtain. In addition, other major crane components are needing replacement/rehabilitation, including the overhead trolley line conductor system, the tugger system, wire rope, geared couplings, gantry drives, and safety guard rails.

This work is planned for the upcoming 2020-2021 winter maintenance period and estimated to require at least four months. The typical JBS winter maintenance period is approximately three months (mid-December to mid-March) during which weather related delays are likely. An early start of the winter maintenance period by one month is anticipated to provide the contractor the time needed to accomplish the crane maintenance and upgrades. All of the STSs will need to be removed from the water by the crane prior to taking the crane out of service. Ice Harbor Project is proposing to pull STSs beginning November 16, followed by the unwatering of the JBS.

An extended winter maintenance period would also help accommodate project maintenance staff to complete other work in the juvenile fish channel. Four unwatering weirs in the channel are on the verge of failure and would be replaced with newly fabricated weirs, completing the replacement of all ten weirs and operating stem connection brackets. In addition, the air-burst cleaning system that is underneath the downstream end of the unwatering inclined floor screen will be expanded to be able to clean the entire floor screen. An expanded air-burst piping would provide a reliable, effective cleaning system for the floor screen, to complement or replace the aging mechanical screen cleaning system.

Type of outage required

Impact on facility operation (FPP deviations)

The STSs would be removed and the JBS would be unwatered November 16, one month early.

Impact on unit priority

None.

Impact on forebay/tailwater operation

None.

Impact on spill

None.

Dates of impacts/repairs

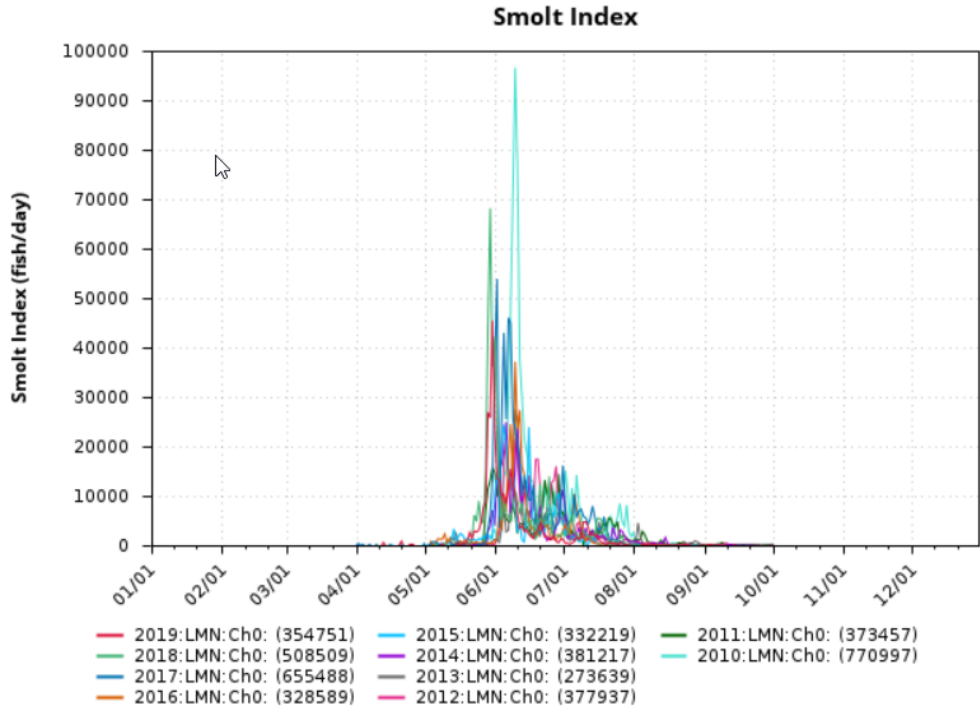
Begin JBS winter maintenance period on November 16, 2020, instead of December 16, 2020.

Length of time for repairs

November 16, 2020 to mid-March, 2021.

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; Juvenile fish passage is not estimated after October 31 at any of the four lower Snake River Dams. Ice Harbor Juvenile Fish Facility conducts very limited sampling in the spring and early summer (4 hours twice per week), with no sampling occurring during other times of the year. Thus juvenile passage at Ice Harbor is typically based on passage at Lower Monumental. Presumably, these passage numbers are representative for Ice Harbor, since there are no tributaries draining into the Snake River between Ice Harbor and Lower Monumental Dams. During the proposed early shut down of the Ice Harbor JBS typically only subyearling Chinook salmon are passing the dam. The 10-year average subyearling Chinook salmon passage at Lower Monumental Dam are presented in Figure 1.



www.cbr.washington.edu/dart

08 May 2020 14:34:12 PDT

Figure 1. Annual fall Chinook salmon passage at Lower Monumental Dam from 2010-2019.

Adult fallback estimates through the Ice Harbor JBS is very limited because the separator is only operated 2 days per week for up to 4-hours prior to mid-July associated with juvenile fish sampling. Thus adult JBS fallback at Ice Harbor is typically based on fallback estimates at Lower Monumental. Average monthly adult fallbacks through the JBS at Lower Monumental for the last three years are shown in the Table 1.

Table 1. Average Monthly Totals of Adult Salmonids Released from the Juvenile Fish Separator at Lower Monumental Dam, 2017-2019

Month	Chinook	Jack Chinook	Clipped Steelhead	Unclipped Steelhead	Sockeye	Coho	Total
April	0	0	96	117	0	0	213
May	15	1	117	220	0	0	353
June	38	7	21	32	0	0	98
July	14	4	2	1	0	0	21
August	6	1	2	3	0	0	12
September ¹	20	16	13	17	0	0	67
Total	93	29	251	390	0	0	764

¹September totals include fallbacks released from the separator on October 1, the last day of collecting fish.

Over the past 10-years only 2 adult steelhead (1 each in 2010 and 2017) have been detected passing downstream through the Ice Harbor Dam JBS full flow PIT-tag detector between November 15 and the dewatering of the JBS in mid-December.

The Ice Harbor JBS is typically unwatered after December 15 each year for annual winter maintenance. The adult salmonids that were recovered from the juvenile fish channel during these unwatering events are shown in Table 2 for the last three years. It is unknown if these fish fallback through the JBS recently or over a period of days or even weeks before the channel was unwatered.

Table 2. Number of Adult Salmonids Recovered During Unwatering of Ice Harbor JBS, 2017-2019

Date	Clipped Chinook	Unclipped Chinook	Clipped Steelhead	Unclipped Steelhead	Coho	Total
12/20/17	0	0	32	15	0	47
12/21/18	0	1	10	4	0	15
12/19/19	2	0	15	9	1	27

The JBS full flow PIT-tag detection system at Ice Harbor Dam became operational in 2005. Over the previous 15-years (2005-2019) only one PIT-tagged Bulltrout has been detected passing downstream through the Ice Harbor JBS full flow system. This fish was tagged in the Tuccannon River and passed through the JBS in June 2011. The numbers of PIT-tagged Bulltrout in the Columbia basin are relatively few compared to salmon and steelhead, however, the lack of detections over 15-years indicate Bulltrout are unlikely to be actively migrating downstream past Ice Harbor Dam through the JBS.

At Lower Monumental Dam Bulltrout observations on either the separator or in the sample over the past 10-years have ranged from 0 to 6 fish per year. Observations of Bulltrout passing through the JBS at Lower Monumental Dam are inconsistent with no fish observed in 6 out of 10 years.

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

Subyearling fall Chinook will be the predominant juvenile fish passing Ice Harbor during the late-season period. Based on the 2019 adult fall Chinook counts at Ice Harbor, which were below the 10-year average (Figure 2), the 2020 wild subyearling fall Chinook juvenile passage is anticipated to be below the 10-year average. Hatchery fall Chinook numbers are anticipated to be similar to those from recent years.

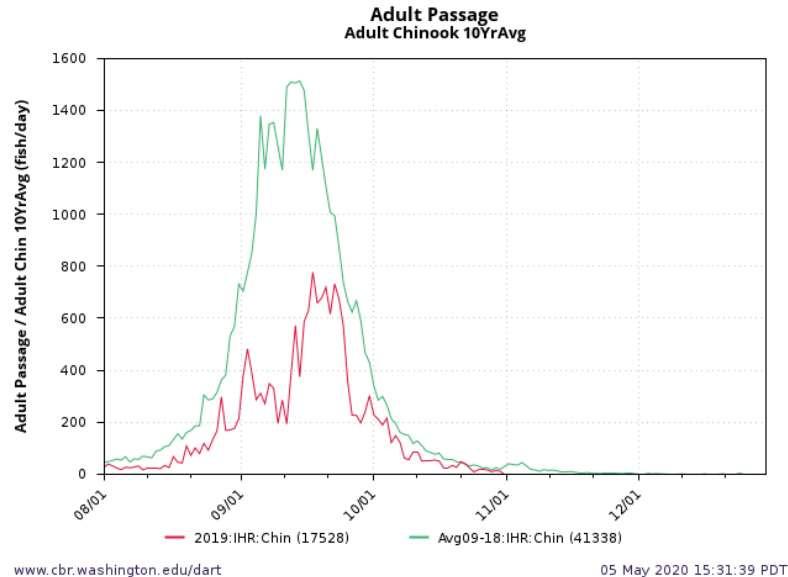


Figure 2. Ice Harbor adult fall Chinook salmon passage at Ice Harbor Dam in 2019 relative to the 10-year average.

State fishery agencies forecast that the 2020 Columbia and Snake River adult steelhead, fall Chinook, and coho runs will be well below the 10-year averages.

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

Juvenile fish passage is not estimated after October 31 at any of the four lower Snake River Dams. Ice Harbor Juvenile Fish Facility conducts very limited sampling in the spring and early summer (4 hours twice per week), with no sampling occurring during other times of the year. Thus impact for the early Ice Harbor JBS shutdown was estimated from observations at Lower Monumental Dam and PIT-tag detections in the JBS at Lower Monumental **and Ice Harbor dams**. Based on PIT-tag detection at Lower Monumental Dam **and Ice Harbor dams**, less than 0.5% of the subyearling population would be passing Ice Harbor November 15 through December 15 (Tables 3 **and 4**). While a relatively small portion of the total juvenile abundance pass through the JBS from November 15 through December 15, these winter migrants are an important part of diversity and have exhibited high survival.

Based on PIT-tag detections of JBS fallbacks and fish salvage (Table 5) during the dewatering of the JBS in December over the past 3-years it is estimated that < 0.1% of the adult fall Chinook, adult coho, or adult steelhead would be passing downstream at Ice Harbor from November 15 through December 15.

Bulltrout are unlikely to be passing downstream at Ice Harbor Dam from November 15 through December 15.

Table 3. Annual juvenile fall Chinook salmon PIT-tag detections (2015-2019), at Lower Monumental Dam as well as during the proposed Ice Harbor JBS outage, and percent of the run passing during the proposed outage.

Year	Nov 15- Dec 15	Annual Total	% of the run
2015	4	3,644	0.1%
2016	24	7,413	0.3%
2017	59	13,824	0.4%
2018	9	13,717	0.1%
2019	4	11,921	>0.1%
5-year Average	20	10,104	0.2%

Table 4. Annual juvenile fall Chinook salmon PIT-tag detections (2015-2019), at Ice Harbor Dam as well as during the proposed Ice Harbor JBS outage, and percent of the run passing during the proposed outage.

Year	Nov 15- Dec 15	Annual Total	% of the run
2015	2	3,399	0.1%
2016	4	2,741	0.1%
2017	42	7,871	0.5%
2018	2	4,358	<0.1%
2019	1	4,643	<0.1%
5-year Average	10	4,602	0.2%

Table 5. Ice Harbor annual adult passage and percent of the run encountered during JBS dewatering in December, 2017-2019.

Fall Chinook Salmon				
	2017	2018	2019	3-year Ave
Annual adult upstream passage	26,393	16,980	17,245	20,206
Salvage during JBS dewatering	0	1	2	1
% in the JBS during dewatering	0.0%	<0.0%	<0.0%	<0.1%
Coho Salmon				
Annual adult upstream passage	5,328	1,310	6,426	4,355
Salvage during JBS dewatering	0	0	1	0
% in the JBS during dewatering	0.0%	0.0%	<0.0%	<0.1%
Steelhead				
Annual adult upstream passage	61,961	48,262	31,824	47,349
Salvage during JBS dewatering	47	14	24	28
% in the JBS during dewatering	0.1%	<0.0%	0.1%	<0.1%

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.);
Voluntary spill for fish passage ends on August 31, and river flows are typically low in the late fall, so involuntary spill would most likely not be occurring. Fish that would be otherwise using the JBS during the last month of the season will instead follow the flow through the running turbines. Balloon tag juvenile fish passage survival through the fish-friendly turbine in unit 2 was estimated at 98%, while survival through conventional Kaplan turbines at Ice Harbor is approximately 87%. Subyearling Chinook survival through the Ice Harbor JBS has ranged from 96 to 99%.

Summary statement - expected impacts on:

Downstream migrants

Late-migrating wild juvenile fall Chinook which represent less than 0.5% of the population would be impacted by the early removal of the STSs. Passage survival through the turbines may be similar to or slightly lower than that of the JBS for these fish. Other runs of juvenile fish are unlikely to be impacted, since their run timing is earlier.

Adult fallbacks that use the JBS during the late-season would also be impacted. These fish are presumed to be a small fraction of the total number of fallbacks that use the JBS over the entire season.

The combination of few Bulltrout observed passing downstream at Lower Monumental and Ice Harbor dams indicate Bulltrout are not regularly migrating downstream through the lower Snake River are unlikely to be impacted.

Upstream migrants (including Bull Trout)

The early shutting down of the Ice Harbor JBS would not impact upstream passage for any species of fish.

Lamprey

There are very few adult and juvenile lamprey moving during that time of year, so the percentage of the population affected would be very small.

Comments from agencies

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

From: Hockersmith, Eric E CIV USARMY CENWW (USA)

Sent: Wednesday, May 13, 2020 7:31 AM

To: Josie Thompson - NOAA Federal <josie.thompson@noaa.gov>

Cc: Fone, Kenneth R CIV CENWW CENWD (USA)

<Kenneth.R.Fone@usace.army.mil>

Subject: RE: [Non-DoD Source] Re: 20 IHR 04 MOC - JBS Early Shut down for Maintenance

Josie,

For 100 ft. of head the operating ranges for Ice Harbor Turbines with screens removed are:

U1 is Kaplan with a 1% operating range of 8,580-14,500 cfs (Upper limit within the 1% range)

U2 is fixed-blade with a 1% operating range of 12,435-14,217 cfs (Upper limit within the 1% range)

U3 - OOS for replacement

U4-U6 have locked blades with operating ranges of 12,568-14,302 cfs

The 1% operating criteria ends November 1st.

Unit Priority from 11/16-11/30 is 1, 2, 6, 4, and then 5. From 12/1-2/28 there is no Unit Priority.

From November 16 to December 15 10-year average daily discharge at Ice Harbor has ranged from 14.7 to 25.5 kcfs. Based on this amount of flow, the project would probably operate 1 to 2 turbines from November 16th to December 15th. The units likely operated during this time would be Unit 1 because it provides station service followed by unit 2. Unit 2 can provide station service but requires the switching of buses.

Volitional passage survival for individual turbines has not been evaluated at Ice Harbor. In addition, no evaluation of survival or direct injury has been conducted for turbines 4, 5, or 6 for the current condition where the blades are fixed.

A balloon tag study of passage survival evaluated Unit 3 (Kaplan) in 2007 and a similar study evaluated Unit 2 (fixed blade) in 2019. Forty-eight hour survival in Unit 3 ranged from 94.9% to 96.7% and for Unit 2 ranged from 96.5% to 99.1%. Passage survival through Unit 1 would likely be similar to what was observed for Unit 3 in 2007 because the turbines are virtually identical.

Eric Hockersmith
Fishery Biologist
U.S. Army Corps of Engineers
Walla Walla District
201 N 3rd Ave.
Walla Walla, WA 99362
Phone: 509-527-7122
Cell: 509-520-4350

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

From: Josie Thompson - NOAA Federal [mailto:josie.thompson@noaa.gov]
Sent: Tuesday, May 12, 2020 9:48 AM
To: Hockersmith, Eric E CIV USARMY CENWW (USA)
<Eric.E.Hockersmith@usace.army.mil>; Fone, Kenneth R CIV CENWW CENWD (USA) <Kenneth.R.Fone@usace.army.mil>
Subject: [Non-DoD Source] Re: 20 IHR 04 MOC - JBS Early Shut down for Maintenance

Hello Eric and Ken,

Regarding this MOC for early JBS shutdown, I was wondering if you could tell me about which turbines would likely be operating from November 15

to December 15, given flows and the likely Unit Priority order at the time. And then for each one likely to be in operation, it would be good to know the type of Unit each one is (Kaplan vs. Fixed, etc.), or known / estimated fish survival for each.

Thanks! Josie

Josie Thompson
Columbia Hydropower Branch

Interior Columbia Basin Office
NOAA Fisheries, West Coast Region
503-231-2313
Josie.Thompson@noaa.gov <mailto:Josie.Thompson@noaa.gov>

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

From: Morrill, Charles (DFW) [mailto:Charles.Morrill@dfw.wa.gov]
Sent: Monday, May 11, 2020 4:03 PM
To: Hockersmith, Eric E CIV USARMY CENWW (USA) Subject: [Non-DoD Source] RE: 20 IHR 04 MOC - JBS Early Shut down for Maintenance

Hi Erick,

I see no reason to object to an early shut down of the JBS at IHR for the required maintenance ...

Charlie

Final coordination results

After Action update (After action statement stating what the effect of the action was on listed species. This statement could simply state that the MOC analysis was correct and the action went as expected, or it could explain how the actual action changed the expected effect (e.g., you didn't need to close that AWS valve after all, so there was no impact of the action). List any actual mortality noted as a result of the action)

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

Ken Fone
Fishery Biologist
Ice Harbor Dam
509-544-3137
kenneth.r.fone@usace.army.mil