

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

**COORDINATION DATE-** 15 IHR 006 Ice Harbor Spillbay 2 Ogee/Deflector Post-Construction Evaluation

**PROJECT-** Ice Harbor Dam

**RESPONSE DATE-** 12 March 2015 (FPOM Meeting)

**Description of the problem:** A research study is being planned for Ice Harbor Dam titled "Spillbay 2 Ogee/Deflector Post-Construction Evaluation" (Section 6.2.2 in the 2015 FPP Appendix A). This study requires the installation of a fish release pipe at the RSW in spillbay 2. Installation will require a mobile crane to hoist the release pipe over the spillway forebay rail and lower it into place for attachment on the downstream side of the RSW walkway. It is expected that a second mobile crane will be needed to hoist a man-basket to position the contractor for pipe attachment. Installation is tentatively scheduled to occur between 19-22 March and expected to require approximately 1.5 days. The study will tentatively occur 3-9 April with pipe removal on approximately 10 April. Date of pipe removal may shift depending upon when the study actually begins. Final pipe removal date will be provided to FPOM once confirmed.

Project support is not expected for installation as spillbays 1-4 are locked out for spillbay 2 construction demobilization. Project requirements such as removing safety clearances and pulling RSW stop logs will take place as scheduled for the construction contract.

Project support will be required for pipe removal. A safety clearance will be required on spillbays 1-3 for overwater work and BRZ safety boat access in the forebay. It may also be necessary to install RSW stop logs. Pipe removal is expected to require 1 day.

**Type of outage required:** A safety clearance on spillbays 1-3 will be required on approximately 10 April for the pipe removal. The RSW will not be available for fish passage on this day.

**Impact on facility operation:** Impact on project staff and maintenance activities are expected to be minimal; however, an Ice Harbor Dam employee will need to hold the safety clearance for locking out spillbays 1-3 for pipe removal. The contractor will provide mobile cranes to complete the work. This will prohibit fish passage through the RSW for approximately 8 hours on 1 day.

The required Project support for pipe installation and removal is currently being coordinated through District Operations and with the Ice Harbor Project.

### Proposed Schedule:

- Installation equipment and release pipe in spillbay 2: 19-22 March, 2015
- Study execution: 3-9 April, 2015
- Release pipe removal: 10 April, 2015
- Equipment removal: 10-15 April, 2015

**Length of time for repairs:** NA

**Expected impacts on fish passage:**

**Juvenile Passage:** An RSW outage during the spill season will affect juvenile fish passage. RSW passage averages approximately 40% for yearling Chinook and juvenile steelhead and approximately 60% for subyearling Chinook (Ham et al. 2009). RSW passage survival averages approximately 95% for the RSW and 96% conventional spill across species and runs (Ham et al. 2009). In the event of spillbays 2 and 3 being locked out for release pipe removal it is reasonable to assume that fish passage will shift from those bays to spillbays 4-10. This would result in smolts passing a route with equally high survival, but lower passage effectiveness. This may result in passage delays on the scale of approximately 1-2 hours (Ham et al. 2009). Ham et al. (2009) reported only one of seven studies finding statistical differences in forebay residence times among spill patterns and treatments. While there is expected to be some affect (likely passage delay) of an RSW outage on 10 April, a relatively small proportion of smolts will experience this affect of an 8 hour RSW outage as  $\leq 10\%$  of the runs will pass by 15 April compared to the bulk of the runs passing by April 30th (Tables 1 and 2).

**Adult Passage:** The Ice Harbor RSW provides a safe fallback route for adult steelhead during this early April time period. Boggs et al. (2005) reported  $\leq 5\%$  steelhead fallback at Ice Harbor across the entire study period between 1997-2003. Based on eight previous years of window count data (2007-2014) it is expected that on average  $\leq 50$  (range = 3 - 104) wild adult steelhead may pass Ice Harbor each day in early April (Figure 1; Table 3). These data suggest that approximately 2 adult steelhead may fall back on a given day. With a 10 April RSW outage these fish would either not fallback or would pass a conventional spillbay. Therefore, it is difficult to accurately assess affects on adult steelhead. Kelt generally experience approximately 93-95% conventional spillbay survival (Colotelo et al. 2013) which may be assumed for upriver migrating adults. Assuming only a couple steelhead would fall back within an 8 hour period and would pass via spillbay, It may be reasonable to assume a minor impact to adults during the RSW outage.

**Comments from agencies:**

**Final results:**

Thank you,

Brad Trumbo  
Fishery Biologist  
Walla Walla District  
[bradly.a.trumbo@usace.army.mil](mailto:bradly.a.trumbo@usace.army.mil)  
509-527-7253



**Table 1.** Migration timing characteristics for yearling Chinook salmon passing Lower Monumental Dam (DART 2015). Data not available for Ice Harbor.

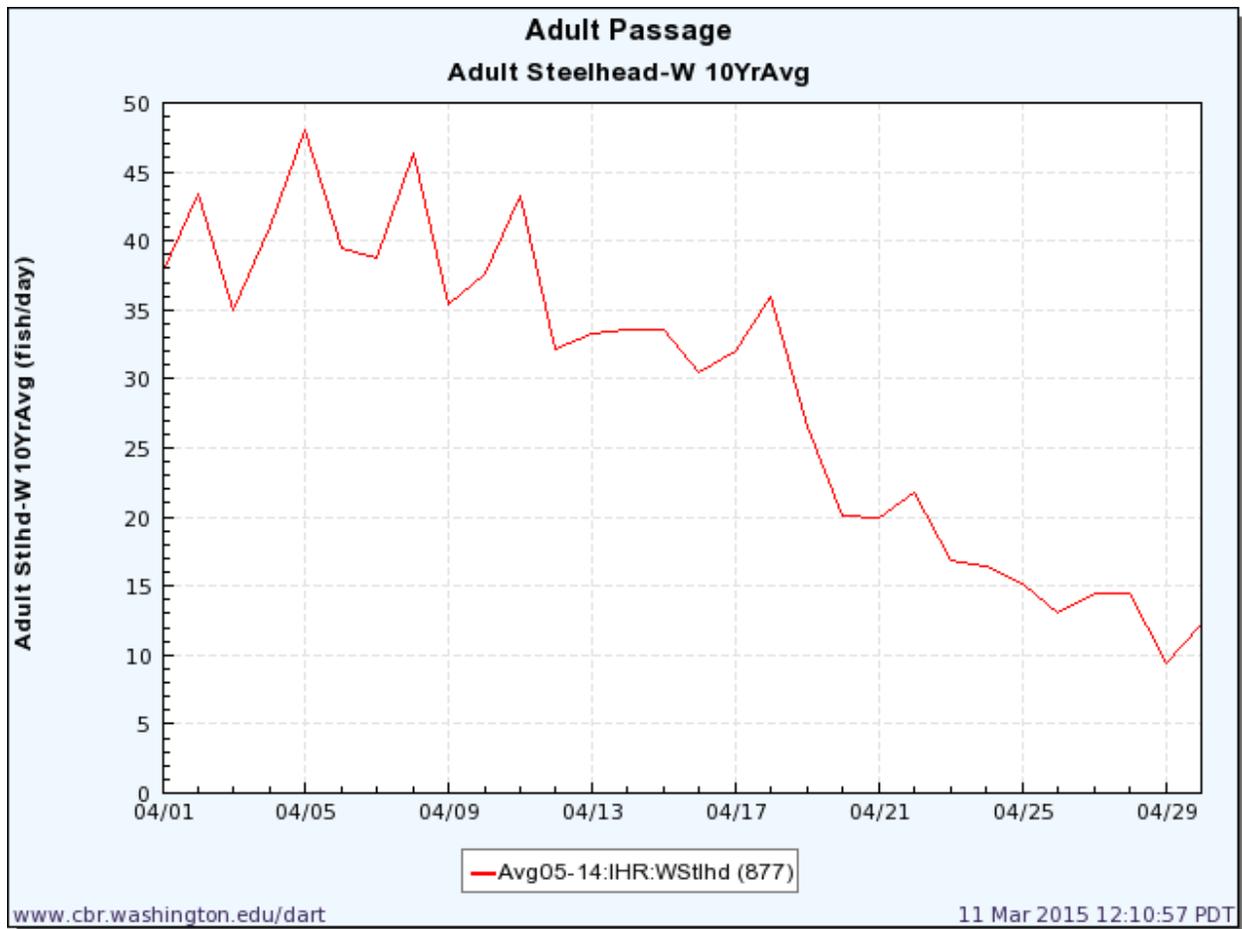
Year	Passage Dates								Middle 80% Days
	First	1%	5%	10%	50%	90%	95%	Last	
2005	04/02	04/04	04/08	04/11	04/23	04/29	04/30	05/01	19
2006	04/07	04/10	04/25	04/28	04/29	05/01	05/01	05/01	4
2007	04/01	04/05	04/08	04/08	04/14	04/30	05/01	05/01	23
2008	04/01	04/11	04/13	04/16	04/23	04/30	04/30	04/30	15
2009	04/01	04/06	04/09	04/09	04/14	04/28	04/29	05/01	20
2010	04/01	04/14	04/17	04/17	04/23	04/29	04/29	04/29	13
2011	04/01	04/13	04/16	04/22	04/28	05/01	05/01	05/01	10
2012	04/03	04/03	04/09	04/12	04/27	04/30	04/30	04/30	19
2013	04/01	04/01	04/07	04/13	04/22	05/01	05/01	05/01	19
2014	04/01	04/22	04/29	04/29	04/30	05/01	05/01	05/01	3

**Table 2.** Migration timing characteristics for juvenile steelhead passing Lower Monumental Dam (DART 2015). Data not available for Ice Harbor.

Year	Passage Dates								Middle 80% Days
	First	1%	5%	10%	50%	90%	95%	Last	
2005	04/02	04/07	04/08	04/10	04/16	04/30	05/01	05/01	21
2006	04/04	04/13	04/25	04/28	04/29	05/01	05/01	05/01	4
2007	04/01	04/05	04/14	04/14	04/26	05/01	05/01	05/01	18
2008	04/01	04/16	04/18	04/19	04/26	04/30	04/30	04/30	12
2009	04/01	04/06	04/12	04/16	04/25	04/30	04/30	05/01	15
2010	04/03	04/17	04/20	04/20	04/26	04/29	04/29	04/29	10
2011	04/01	04/04	04/07	04/16	04/25	05/01	05/01	05/01	16
2012	04/03	04/03	04/06	04/15	04/27	04/30	04/30	04/30	16
2013	04/01	04/07	04/10	04/13	04/22	04/28	05/01	05/01	16
2014	04/01	04/22	04/29	04/29	04/30	05/01	05/01	05/01	3

**Table 3.** Window counts of wild adult steelhead passing the Ice Harbor south fishway during the first ten days of April, 2007 – 2014.

Day	Year								Mean
	2007	2008	2009	2010	2011	2012	2013	2014	
<b>1</b>	46	29	16	41	62	61	16	10	<b>35</b>
<b>2</b>	36	22	38	62	104	7	25	13	<b>38</b>
<b>3</b>	29	17	33	45	52	3	66	13	<b>32</b>
<b>4</b>	28	18	61	45	49	-1	61	20	<b>35</b>
<b>5</b>	28	44	51	33	50	7	82	35	<b>41</b>
<b>6</b>	27	26	26	46	11	21	51	6	<b>27</b>
<b>7</b>	37	40	13	50	7	23	73	28	<b>34</b>
<b>8</b>	34	90	17	54	2	8	66	25	<b>37</b>
<b>9</b>	17	51	39	38	2	5	50	17	<b>27</b>
<b>10</b>	21	58	40	15	10	27	47	24	<b>30</b>



**Figure 1.** Ten year average daily wild adult steelhead passage at Ice Harbor Dam during the month of April (DART 2015).

## References:

Colotelo, AH, BW Jones, RA Harnish, GA McMichael, KD Ham, ZD Deng, GM Squeochs, RS Brown, MA Weiland, GR Ploskey, X Li and T Fu. 2013. Passage Distribution and Federal Columbia River Power System Survival for Steelhead Kelts Tagged Above and at Lower Granite Dam. Report of the Pacific Northwest National Laboratory to the US Army Corps of Engineers, Walla Walla District, Walla Walla, Washington.

Boggs, CT, ML Keefer, CA Peery, LC Struehrenberg and BJ Burke. 2005. Fallback, reascension and adjusted fishway escapement estimates for adult Chinook salmon and steelhead at Columbia and Snake River dams, 1996-2003. Report of the Idaho Cooperative Fish and Wildlife Research Unit to the US Army Corps of Engineers, Walla Walla District, Walla Walla, Washington.

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