CENWP-OD-B **13 January, 2016**

MEMORANDUM FOR THE RECORD

SUBJECT: 16BON01 MFR Bradford Island forebay lamprey larval survey

Between 10 – 24 February, a USACE contractor will be conducting maintenance dredging in the vicinity of the Bradford Island fish ladder exit, in the Powerhouse 1 forebay. This dredging is considered regular maintenance under the 2015 Fish Passage Plan (FPP) section 2.5.1.14 and is conducted to maintain proper operation of the fish ladder and remove any material that may impede successful upstream fish passage. The operation will remove approximately 700 – 1000 cubic yards of accumulated sediment and debris to achieve a base elevation of +63 msl. While this activity is timed to minimize effects on upstream migrants, it is possible that larval Pacific lamprey and other lamprey species (e.g. western brook lamprey) may be present in the dredging area. In an effort to better understand the potential effects of this activity on lamprey ammocoetes that may be rearing in the sediment, the Corps and USFWS propose to conduct a brief survey to determine presence/absence prior to the dredging activity.

The USFWS crew will use boat-mounted, deepwater/suction dredge electrofishing technology (**Figure 1**) to sample the bottom sediments proximate to the Bradford Island Ladder exit area (dredging area shown in **Figure 2**). Based on the size of the area of interest, USFWS estimates 10 to 15 samples ("drops") will be needed to assess lamprey ammocoete occupancy. Sampling will occur on a single day during daylight hours, between 10:00 AM and 3:00 PM. Based on personnel availability and the dredging schedule, sampling will occur during the week of January 25, with January 26 as the target date.

The sampling work will require closure of the Powerhouse 1 Ice and Trash Sluiceway (ITS) from 10:00 AM to 3:00 PM (5 hours or shorter duration, if survey is completed in less time) on a single day during the week of January 25 (likely on January 26). Per the 2015 FPP (section 2.5.1.13.b), the Corps "may close the ITS endgate or ITS gates for winter maintenance (including researcher equipment O&M). Closures may not exceed six hours per day unless otherwise coordinated with FPOM." **This memo is thusly being distributed as a courtesy.**

A. Species – A temporary outage of the ITS during the in-water work period poses minimal risk for migrants. Other fish, such as Pacific lamprey and white sturgeon, may also benefit from winter operation of the ITS. While adult lamprey don't actively migrate during the winter, Pacific lamprey macropthalmia (juveniles) are known to outmigrate during the winter months, particularly during freshets. The effects of turbine passage on juvenile lamprey is not as well understood as it is for salmonids, but studies suggest that they migrate lower in the water column and are less vulnerable to injuries associated with turbine passage (Colotelo et al. 2012, Monk et al. 2004, Moursund et al. 2003a, Moursund et al. 2003b). Temporary closure of the ITS likely poses minimal risk for outmigrating juvenile lamprey and the proposed ammocoete survey work will provide unprecedented

information on larval lamprey occupation of sediments in close proximity to Bonneville Dam.

B. Origin – Unknown.
C. Length – N/A
D. Marks and tags – N/A
E. Cause and Time of Death – N/A. The proposed activity and temporary closure of the Powerhouse 1 ITS will occur during the in-water work window for Bonneville Dam.
F. Future and Preventative Measures – This survey is a one-time operation. No future surveys are currently planned.

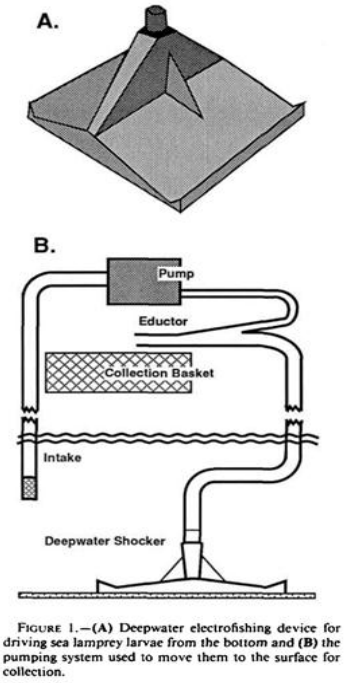

FIGURE 1.—(A) Deepwater electrofishing device for driving sea lamprey larvae from the bottom and (B) the pumping system used to move them to the surface for collection.

Figure 1. Diagram (left) and photo (right) of deepwater electrofishing device and boat to be used by USFWS to survey for Pacific lamprey ammocoetes in the area to be dredged.

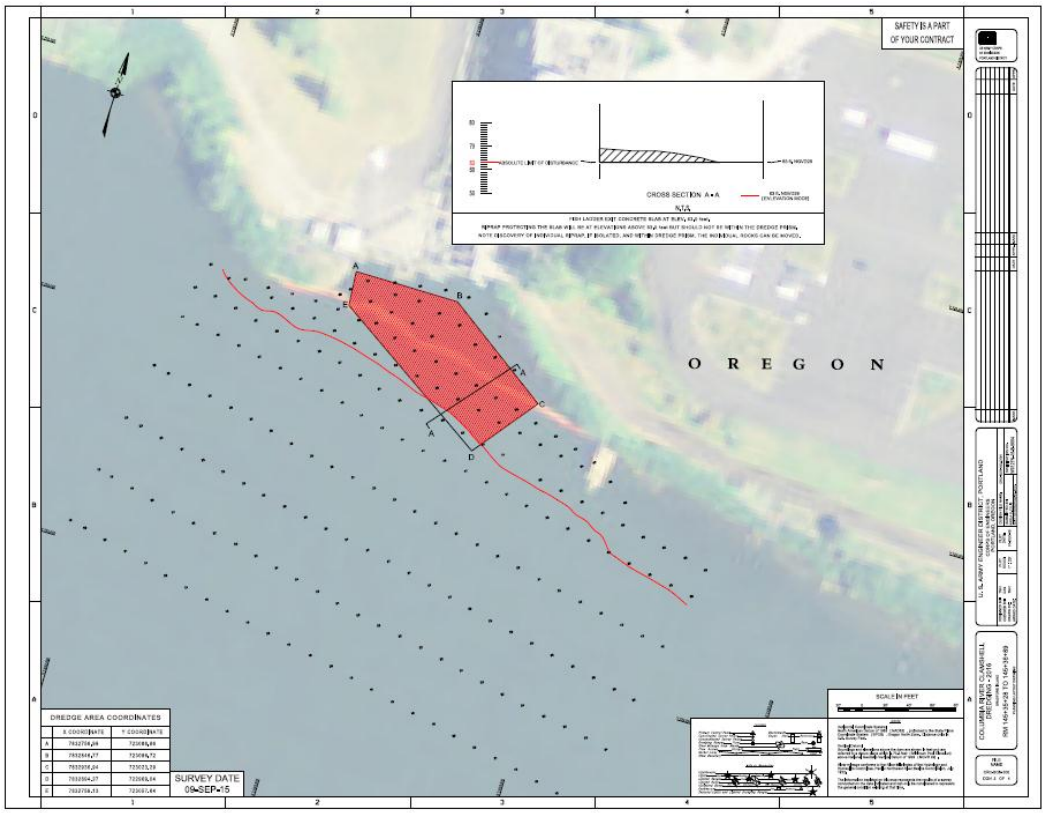

Figure 2. Area to be dredged to maintain operation of the Bradford Island Fish Ladder. Area highlighted in red is the approximate dredging area polygon. The proposed larval lamprey survey will occur in this general area.

References

Colotelo, A.H., B.D. Pflugrath, R.S. Brown, C.J. Brauner, R.P. Mueller, T.J. Carlson, Z.D. Deng, M.L.Ahmann, B.A. Trumbo. 2012. The effect of rapid and sustained decompression on barotrauma in juvenile brook lamprey and Pacific lamprey: Implications for passage at hydroelectric facilities. Fisheries Research 129-130 (2012) 17-20.

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Moursund, R.A, D.D. Dauble, and M.J. Langeslay. 2003b. Turbine Intake Diversion Screens: Investigating Effects on Pacific Lamprey. Hydro Review (March 2003), 1-4.