# Fish Passage Plan (FPP) Change Request Form

**Change Form # & Title**: 17BON006 – SLEDs Operating Criteria

**Date Submitted**: December 29, 2016; REVISED 1/26/2017

**Project**: BON

**Requester Name, Agency**: Gary Fredricks, NOAA Fisheries

**Final Action:** **APPROVED 1/26/2017**

**FPP Section**: BON 2.4.1. Adult Fish Facilities – Winter Maintenance Period (Dec-Feb);

BON 2.4.2. Adult Fish Facilities – Fish Passage Season (Mar-Nov)

**Justification for Change**: Current FPP guidance calls for removing SLEDs at fishway entrances by August 1, then re-installing sometime after September 30, by no later than February 1.

In 2016, a Stellar sea lion was observed in the PH2 collection channel junction pool on September 1 (see MFR [16BON109](http://www.nwd-wc.usace.army.mil/tmt/documents/FPOM/2010/2016_FPOM_MEET/2016_SEP/)). In response, the project installed 3 of 4 PH2 SLEDs on September 1, lowered the NUE SLED on September 3, and installed the PH1 SLEDs on September 6. The CI SLED remained installed due to lack of crane availability.

The potential effect of SLEDs on smaller adult salmon such as sockeye remains unknown. One approach to balance the risk of delay for these smaller fish with the risk of a sea lion in the ladder is to pull the SLEDs (except the B-branch spillway entrance SLED which would remain in due to the crane availability issue) on or about June 1 with re-installation on or about July 20 (or as soon as possible if a sea lion is seen in any fishway).

**Proposed Change**:

**BON 2.4.1. Winter Maintenance Period (Dec-Feb)**

**2.4.1.7.** Sea Lion Exclusion Devices (SLEDs) will be installed at all adult fishway entrances and all floating orifice gates (FOGs).

**Add new paragraph to BON 2.4.2. Fish Passage Season (Mar-Nov)**

**2.4.2.10.a.** Sea Lion Exclusion Devices (SLEDs) will be at all adult fishway entrances and all floating orifice gates (FOGs). FOG SLEDs can be left in year-round. Either the B-Branch or Cascades Island entrance SLED (dependent on crane location) may be left in year-round due to the inability to move the 65-ton crane across the spillway. All other entrance SLEDs will be raised by June 1 for adult sockeye passage and lowered by July 20, or as soon as possible if a sea lion is observed in the fishway.

**Comments**:

December 8, 2016 FPOM: There are several options: leave all SLEDs in all the time; pull them for June-July; or leave in at certain entrances and not others. FFU provided a handout on sea lion abundance in the tailrace at BON for 2016 (posted on FPOM website). Wertheimer said that if there are sea lions in the tailrace and no SLEDs, they will get in the ladder. Increasing velocities with SLEDs might not be good for lamprey. Royer said that a major concern is turnaround time with limitations on moving the crane across the spillway for the spillway entrance SLEDs. The crane would need to be driven via the highway to the other side, so it may not be practical to drop/pull SLEDs based on conditions. Peery said that there was little to no evidence of spring Chinook delay, but there are no data on sockeye or lamprey so June could be an issue if SLEDs are in. Lorz asked about just removing Washington Shore SLEDs. Sockeye tend to move in one pulse so it would be good to reduce delay if at all possible. Another option would be to pull them in June on the side that the crane is on. Conder had concerns about pulling SLEDs and taking the risk that a sea lion might get into the ladder without data showing delay to sockeye/lamprey. FFU data show that there are always sea lions in the tailrace. Fredricks said leaving SLEDs in year-round may be safest approach. In absence of info, pull what the project can with crane availability or leave them in. **ACTION:** A separate meeting will be scheduled for this topic (Fredricks, Royer, Conder, Lorz).

December 29, 2016

**FILE MEMORANDUM**

**FROM:** Gary Fredricks

**SUBJECT:** Sea Lion Exclusion Device Usage at Bonneville Dam

After reviewing of all the information I could find on this subject I have put together the following information points in support of a decision to modify the current (2016) Fish Passage Plan (FPP) guidance on installation of the Sea Lion Exclusion Devices (SLEDs) at Bonneville Dam.

1. Sea lion (mainly Steller sea lion) presence is increasing at Bonneville in the summer and fall (FFU 8 Dec 2016 memo for FPOM).
2. The average sea lion presence in June and July has been quite low with the occasional sighting of one or two animals per day. However, June and July presence appears to be increasing based on 2016 observations (Robert Wertheimer, FFU, 8 Dec 2016 FPOM Meeting).
3. The Bonneville project’s 30 ton crane can lift all of the SLEDs except the spillway entrance SLEDs, which need the 65 ton crane. The 60 ton crane cannot cross the spillway(Royer 19 Dec 2016 email). Thus, 7 of the 8 main entrance SLEDs can be moved without transporting a crane.
4. The SLEDs could be deployed or removed in a day but the day depends on crew availably. There is a risk that, if necessary, the SLEDs could not be placed for 3 days due to the normal maintenance crew work week (Royer 19 Dec 2016 email).
5. The effect of the SLEDs on fish passage was studied in 2005 and 2006 (Jepson et al. 2007 draft report.). Only the 2006 SLEDs were of the current design. No significant effects were found on passage of spring Chinook in either year although there was some slowing of entry into a fishway after first approach in 2005.
6. I could find no evaluation of SLED effects on lamprey or other salmon species, particularly sockeye which, because of their size, may be more sensitive to the SLED hydraulics.
7. CFD modeling conducted for the WA shore lamprey entrance evaluated SLEDs in vs. out hydraulic conditions for the north downstream entrance. That analysis indicated that entrance and approach velocities were in the 11 to 13 fps range in both conditions. However, the SLEDs tended shift some of the velocity from the more open tailrace area downstream of the entrance to the confined spaces between the SLED members right at the entrance (from data presented in Kahn and Willig, AECOM, 2010). Shifting and concentrating velocities in this manner could make entrance into the fishways more difficult for some species.
8. The Corps adult count data indicates that the primary adult sockeye passage period at Bonneville Dam runs from about June 1 through mid to late July.

The potential effect of the SLEDs on smaller adults such as sockeye remains unknown. One approach to balance the risk of delay for these smaller fish with the risk of a sea lion in the ladder would be to modify the draft change form for the 2017 FPP such that the Bonneville project pulls the SLEDs (except the B-branch spillway entrance SLED which would remain in due to the crane availability issue) on or about June 1 with re-installation on or about July 20 (or as soon as possible if a sea lion is seen in any fishway).

January 5, 2017 - Email from Ida Royer, BON Fisheries: We're ok with the proposal. I believe folks are aware of the risks and the project can support the action. I did go through the change form and make minor edits -- one, I stated 60-ton and it's a 65-ton crane. More importantly, that crane is not permanently stationed on the WA side; it can get shipped around. This occurs once or twice a year due to cost and therefore dropping and raising both spillway gates in a ~1+ month time span isn't very realistic for us. Therefore either the B-branch \*or\* the CI entrance gate will be left down, but which one is dependent on where the crane will be.

Thus far it's looking like the crane will be on the WA side this spring/summer, meaning B-branch will stay closed. This may not stay consistent year to year.

January 12, 2017 FPOM: Fredricks is fine with leaving spillway entrance SLEDs in year-round due to the crane conflict, but still wants engineer input on that idea (Lorz, Schlenker, etc). The spillway entrance SLEDs have less of an effect on fish than the PH entrance SLEDs, so leaving them in would likely have little to no fish impacts.

January 26, 2017 FPOM FPP: Fredricks revised to add “…dependent on crane location…” Other than that, it’s good to go. Swank stated there is still a need for more data on ladder entrance velocities w/ vs. w/o SLEDs and impacts on sockeye and lamprey.

**Record of Final Action**: Approved as revised at FPOM FPP meeting 1/26/2017