# OFFICIAL COORDINATION REQUEST FOR NON-ROUTINE OPERATIONS AND MAINTENANCE

**COORDINATION TITLE-** 22JDA07 Block Study - Running the South Fish Ladder in “Shad Mode” to Test for Water Cooling Capabilities

**COORDINATION DATE-** August 2nd, 2022 – August 16th, 2022

**PROJECT-** John Day Dam

# RESPONSE DATE- June 17, 2022

**Description of the problem**

The John Day Project (JDA) has high temperature differentials at the south fish ladder (SFL). When the SFL exit is ≥70°F, the temperature differential between the ladder entrance and exit is ≥1°C about 21% of the time (based off a 10-year average May-September). This has negative impacts on fish passage efficiency and may lead to delayed passage times for ESA listed fish.

JDA fisheries is requesting to perform a block study to determine if running its SFL in “shad mode” helps reduce exit/entrance temperature differentials. “Shad mode” is the setting used at JDA ladders to increase the amount of auxiliary water fed through diffusers, into the ladder (near the exit section), and ultimately aid in shad passage. At this time the weir crest in the ladders is increased from 1.0’ to 1.3’.

The auxiliary water is fed through 2-24” pipes at an elevation of 238’ Mean Sea Level (MSL). The elevation of the SFL exit floor is 250.5’ MSL with an average forebay elevation of approximately 263.5’ MSL (from August 2nd – August 16th based on the 10-year average). Studies have shown a thermocline in the JDA forebay with water gradually cooling the deeper it is in the water column.

This block study should demonstrate if pulling more of that cooler water into the ladder helps reduce the differentials and lead to better passage efficiency. It should be noted that JDA doesn’t have an effective way to track ladder passage efficiency as there are only 2-PIT tag readers in the ladder, they are both near the entrance section (and count station), and they are relatively close to one another. Therefore, any reference to fish passage improvements would be based solely on changes in exit/entrance differentials.

**Study Design**

From August 2nd, 2022 – August 16th, 2022, JDA fisheries will have their SFL running in “shad mode” in 2 day on/off blocks from 1’ – 1.3’ of water in the overflow section. Shad mode typically starts early-June and is completed by mid-July (based off shad passage counts at Bonneville). JDA has 6-termperature probes deployed in the SFL, and temperature comparisons from before, during, and after the block study can be analyzed. If the study is successful at cooling ladder water temperatures a definitive reduction in exit/entrance differential temperatures should be observed.

# Type of outage required

**Impact on facility operation** The SFL will still be in service, the only change in operation will be that the butterfly valves controlling the diffuser water in the SFL will be open more than normal for the proposed timeframe.

**Impact on unit priority** This will NOT impact unit priority

**Impact on forebay/tailwater operation** This will NOT impact forebay/tailwater operations.

**Impact on spill** This will NOT impact spill operations.

**Dates of impacts/repairs** August 2nd, 2022 – August 16th, 2022

**Length of time for repairs** There will be no repairs made at this time.

# Analysis of potential impacts to fish:

No impact to adult fish passage is expected from this operation. Fish pass the SFL efficiently during the shad operation during its regular operation in the June-July timeframe.

# Summary statement - expected impacts on:

**Downstream migrants** PIT data shows an insignificant number of juveniles pass through the SFL. Therefore, there should be little to no impact on juvenile fish passage.

**Upstream migrants (including Bull Trout)** The ladder will be running in “shad mode” for 2-weeks in 2 day on/off sequence (August 2nd – August 16th). The 10-year average for this time varies between species (Figure 1).

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| **10-Year Average Total Passage (NFL and SFL) at John Day Project August 2nd – August 16th**  |
|   | Steelhead | Chinook | Lamprey | Sockeye | Coho |
| 8/2 | 599 | 339 | 120 | 91 | 0 |
| 8/3 | 586 | 369 | 107 | 103 | 0 |
| 8/4 | 520 | 256 | 94 | 65 | 1 |
| 8/5 | 482 | 250 | 86 | 61 | 0 |
| 8/6 | 501 | 248 | 87 | 55 | 0 |
| 8/7 | 507 | 260 | 93 | 52 | 0 |
| 8/8 | 521 | 280 | 73 | 48 | 0 |
| 8/9 | 553 | 341 | 72 | 44 | 0 |
| 8/10 | 463 | 352 | 58 | 33 | 0 |
| 8/11 | 427 | 331 | 69 | 28 | 0 |
| 8/12 | 366 | 300 | 78 | 18 | 0 |
| 8/13 | 344 | 362 | 65 | 18 | 1 |
| 8/14 | 384 | 385 | 85 | 17 | 1 |
| 8/15 | 325 | 324 | 64 | 15 | 1 |
| 8/16 | 305 | 400 | 57 | 9 | 1 |
| Total | 6,882 | 4,797 | 1,206 | 656 | 5 |

**Figure 1**: A table showing the 10-year daily count average at JDA for Steelhead, Chinook, Lamprey, Sockeye, and Coho. The timeframe is August 2nd – August 16th. This is average total passage for both ladders. Some of these fish would have passed at the NFL.

**Lamprey:** There will be some lamprey passage during this time (Figure 1).

# Comments from agencies

**Final coordination results**

Please email or call with questions or concerns.

Thank you,

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