



FISH PASSAGE CENTER

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MEMORANDUM

TO: Fish Passage Advisory Committee

Michele DeHart

FROM: Michele DeHart

DATE: February 5, 2018

RE: Summary of Little Goose Analyses of upstream passage

The FPC staff has completed and presented several analyses to support discussions of Little Goose Project operations alternatives. Decisions regarding operations at the Little Goose project for adult passage are complex because some operations alternatives for adult passage have negative impacts (both direct and delayed) on juvenile salmon by increasing juvenile passage through the project powerhouse when spill for fish passage is decreased.

The FPC staff examined three components of juvenile and adult passage at Little Goose Dam and, in addition, reviewed the IDFG spreadsheet analysis that was proposed as a tool for detecting an adult passage problem at Little Goose Dam. A memorandum describing the analytical approaches, methods, and results of each of these analyses has been completed.

FPC review of NOAA evaluation of Little Goose Passage 2017

- Adult passage rate issues have been present at the Little Goose project before the provision of spill for juvenile fish passage
- The configuration of the project and the bathymetry of the tailrace are a primary source for tailrace conditions that affect adult passage rates
- Powerhouse and spill bay operations may contribute to those conditions

Analyses of Spring Chinook adult passage and project operations at Little Goose

- Among operational variables, the operation of spillbay 1 (i.e., the TSW) had the largest effect on the adult passage rates at Little Goose when analyzing hourly project operations and adult passage.
- Operational decisions at Little Goose in May 2010 corroborate these analytical results, illustrating the negative impact the TSW can have on adult passage. On two separate occasions, the TSW was closed (once for 8 hours and once for nearly two days) while maintaining a uniform spill pattern and spill percent. During each of these two occasions, adult passage increased dramatically at Little Goose compared to the days that the TSW was operating.

Spring chinook upstream adult success and Lower Snake River travel time

- The time that spring Chinook spend in the Ice Harbor to Lower Granite river reach does not affect their upstream migration success to or above their hatchery of origin
- The time that spring Chinook spend in the Lower Monumental to Little Goose river reach does not affect their upstream migration success to or above their hatchery of origin.

Review of IDFG spreadsheet analyses (distributed to FPAC 6/2017)

- The IDFG spreadsheet is not an adequate tool for determining whether an adult passage issue is occurring at Little Goose because of inherent assumptions that do not account for variability in upstream travel time, passage timing, and conversion rates.
- Even if the range of variability is incorporated into this approach and adult passage rate is outside that range, parameter uncertainties would preclude directly attributing that effect to operations at Little Goose. .

These analyses are provided to FPAC to inform discussions of Little Goose project operations alternatives. Reducing spill for juvenile fish passage results in additional juvenile fish passing through powerhouses which has been shown to increase direct and delayed mortality and reduce smolt-to-adult returns. Given that time spent in the Lower Snake River reach does not have a significant effect on upstream migration success of spring Chinook, these analyses suggest that a future approach that avoids reducing spill for juvenile passage could include:

- Focus on reducing or periodically eliminating spill bay 1 TSW flow and maintain a uniform spill pattern and spill level for juvenile fish passage operation. For the 2018 downstream passage and spill for fish passage period, the COE plans to modify Spill Bay 1 to an Adjustable Spillway Weir making openings and closures and incremental opening changes easier and quicker to implement.
- Adjust unit priorities to moderate tailrace conditions
- Adjust sport fishing areas so that fishing does not occur in areas where fish may be holding and resting as a result of the configuration and bathymetry of the Little Goose tailrace.