



FISH PASSAGE CENTER

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MEMORANDUM

TO: Fish Passage Advisory Committee

FROM: Michele DeHart

DATE: June 1, 2018

SUBJECT: Review of special operation at LGS to improve adult passage

A modified operation was implemented at 0400 on May 30th at Little Goose Dam (LGS) to remedy an adult passage issue. Under the modified operation, spill is reduced to 30% of instantaneous flows for the period of 0400-1200 while excess flows are stored into the forebay, inflows are passed for the period of 1200-1600, and spill is increased from 1600-0400 to a level necessary to pass all stored water from the 0400-1200 period (but not to exceed 130% TDG in the tailrace). This modified operation is planned to run through 0400 on June 2nd, with a TMT check-in planned for June 1st to determine if an extension is necessary. The Fish Passage Center (FPC) staff has reviewed hourly flow and spill data at Little Goose, Lower Monumental, and Ice Harbor dams, both prior and during the special operation. Below is a brief summary of our findings from this review, which may inform discussions during the TMT check-in.

- Based on our analyses of the operation to date, it appears that the special operation at Little Goose does impact juveniles, in the form of increased powerhouse passage at LGS and, to a lesser degree, at Lower Monumental Dam (LMN). PITPH at Ice Harbor Dam (IHR) remained unchanged.
- Hourly passage proportions of PIT-tagged subyearling Chinook also changed during the special operation at LGS. During the special operation at LGS, a greater proportion of detections occurred during night time hours than the previous two days. This change is likely due to increased powerhouse passage proportions after ponding/spill reduction caused more fish to be entrained in powerhouse flows.

- Given this, and the fact that adult counts at LGS have improved in recent days, and flows are projected to decrease over the next several days, we recommend that the operation not be continued beyond its original 3-day period.
- Furthermore, we recommend that FPAC explore manipulating TSW operations when considering special operations at LGS to improve adult passage, as these manipulations are unlikely to affect juvenile out-migrants at LGS any more than the operation that was just conducted and will not affect out-migrants at LMN or IHR.

FPC summarized hourly flow and spill data at LGS, LMN, and IHR over the period of May 28th through May 31st. This includes two days prior to implementation of the special operation at LGS and the first two days of the special operation. Although the special operation has been described as being at LGS, total discharge, spill volumes, and spill proportions were affected at LMN and IHR as well (Table 1, Figure 1). In addition, spill proportions at LGS did not increase above prior levels during the 1600-0400 period (Figure 1). This is because, although spill volumes did increase during this period, so did total discharge, which equates to spill proportions similar to previous days.

To estimate whether these changes may have resulted in impacts to juveniles, we estimated hourly PITPH at each of these projects, for both yearling Chinook and steelhead, using the PITPH equations provided in Appendix J of the 2015 CSS Annual Report (McCann et al. 2015). Reductions in spill proportions, and total discharge, at LGS and LMN during the first two days of the special operation resulted in increases in daily average PITPH at LGS and, to a lesser degree, at LMN, compared to previous two days (Table 1, Figure 1). Furthermore, because spill proportions did not increase at LGS during the 1600-0400 period, PITPH did not improve during this period to make up for increases in PITPH during 0400-1200 period (Figure 1). PITPH at IHR remained unchanged during the period of the special operation compared to previous two days.

Table 1. Daily average spill proportion and PITPH (yearling Chinook and steelhead) at Little Goose, Lower Monumental, and Ice Harbor dams two days prior and first two days of special operation at Little Goose Dam.

Site	Date	Daily Average Spill Proportion	Daily Average PITPH (Chinook)	Daily Average PITPH (Steelhead)
LGS	May 28	0.43	0.44	0.44
	May 29	0.50	0.35	0.33
	May 30	0.40	0.48	0.49
	May 31	0.37	0.50	0.52
LMN	May 28	0.44	0.29	0.26
	May 29	0.42	0.29	0.26
	May 30	0.40	0.31	0.28
	May 31	0.38	0.30	0.28
IHR	May 28	0.66	0.13	0.11
	May 29	0.65	0.13	0.11
	May 30	0.65	0.13	0.12
	May 31	0.64	0.12	0.11

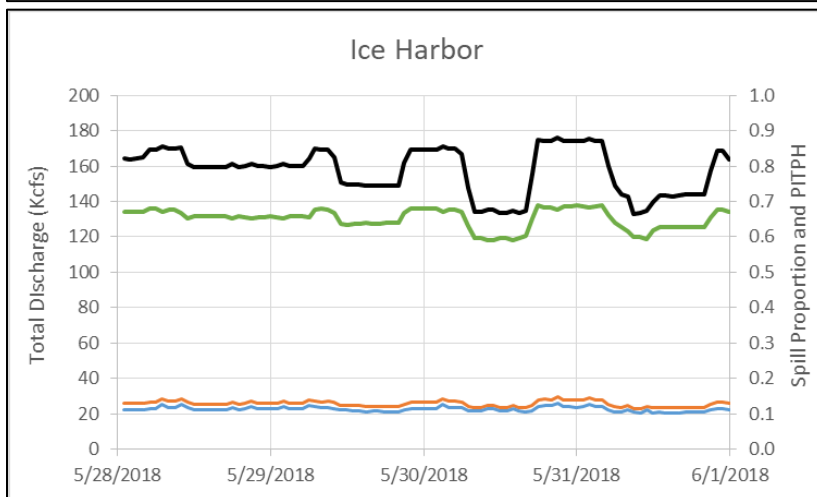
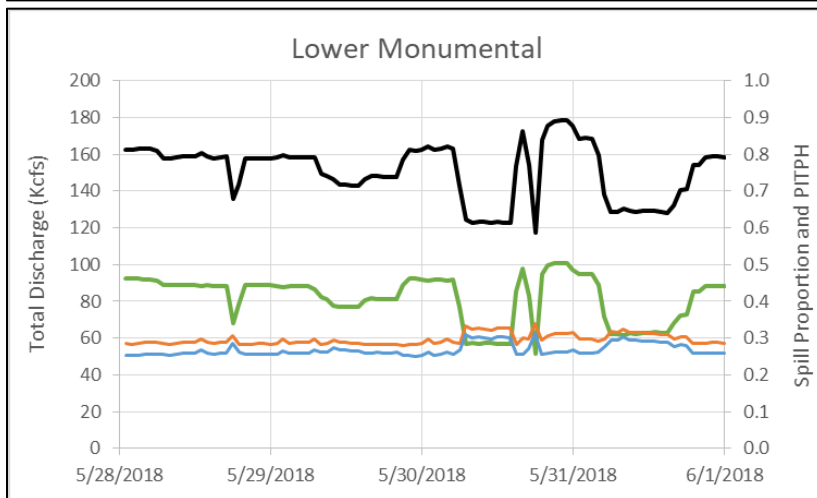
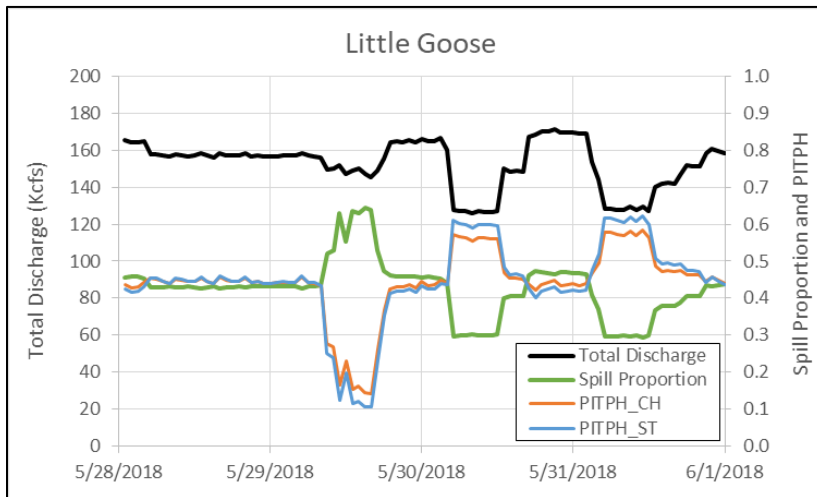


Figure 1. Hourly total discharge (Kcfs), spill proportion, and estimated PITPH (yearling Chinook and steelhead) at Little Goose, Lower Monumental, and Ice Harbor dams two days prior (May 28-29) and the first two days of the special operation at Little Goose to remedy adult passage issues (May 30-May 31).

In addition, we reviewed hourly PIT-tag detections at the full flow bypass detector at LGS. As with the analysis above, we did this for the two days prior and the first two days of the special operation at LGS. From our review, we found that hourly PIT-tag passage proportions of PIT-tagged subyearling Chinook changed during the special operation at LGS (Figure 2). During the special operation, a greater proportion of detections occurred during night time hours. This change is likely due to increased powerhouse passage proportions after ponding/spill reduction caused more fish to be entrained in powerhouse flows.

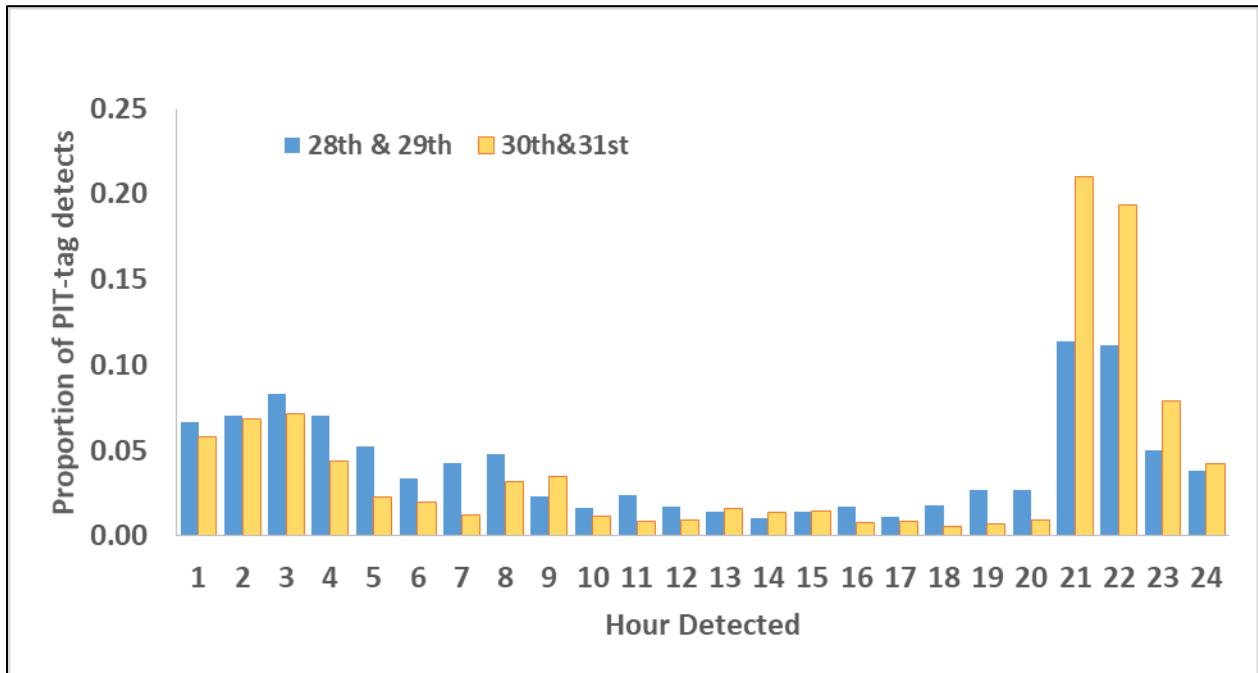


Figure 2. Hourly proportion of detections at Little Goose full flow bypass of PIT-tagged hatchery subyearling Chinook prior to (May 28th and 29th—blue bars) and during (May 30th and 31st—yellow bars) the special operation at LGS.