



## FISH PASSAGE CENTER

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### MEMORANDUM

TO: FPAC

*Michele DeHart*

FROM: Michele DeHart

DATE: July 7, 2005

RE: Adult Passage in the Snake River

At last Tuesday's (July 5, 2005) FPAC meeting, concern was expressed as to whether the summer spill operation was affecting adult passage and survival through the Snake River. Subsequent to the meeting some FPAC members requested that we investigate the adult passage numbers to-date in the Snake River, and the historic information, to determine if we could identify specific issues with passage.

Coincident with the initiation of spill on June 20, it was observed that the adult counts declined at Little Goose Dam. The situation was immediately addressed by changing spill patterns and by reducing daytime spill percentages. Spill patterns were changed on the weekend following the initiation of spill on June 20<sup>th</sup>. When the adult passage did not improve, efforts were undertaken to reduce the spill volume relative to the amount of water passing through the powerhouse in order to draw more adults to the fishway entrances. Spill was reduced to 50% of total river flow during daytime hours on June 28, and then when adult passage numbers did not increase, spill was further reduced to 30% of river flow during daytime hours on June 30. Adult fish counts at Little Goose Dam responded and exceeded 1500 fish for the day. Adult passage appears to have proceeded without problems, except for July 5 when the adult count decreased to 57 fish. This appeared to be due to a delayed operational change from the nighttime to the daytime spill pattern at the project.

The question posed is whether or not fish are passing through the Snake River, or if additional delay or mortality is being imposed due to the summer spill operations. There are two possible ways to look at adult passage in the Snake River, the traditional adult counts for which there is a long time series of data, and the more recent adult PIT tag detections that are available since the installation of the adult PIT tag detector at Ice Harbor Dam in 2003.

## Traditional Adult Counts

Traditional adult counts are made visually at all the Snake River Projects. Counts are provided via the US Army Corps of Engineer's web page. Table 1 shows the adult counts for the time period of most concern relative to adult passage and spill, and lagged one day at each of the projects upriver from Ice Harbor Dam to account for passage between the projects. From the data it appears that there is about a 337 fish difference between Ice Harbor and Lower Monumental, a 404 fish difference between Lower Monumental and Little Goose Dam and about a 42 fish difference between Little Goose and Lower Granite Dam. The 404 fish difference between Lower Monumental and Little Goose Dam should also be adjusted downward for the few fish that return to the Tucannon and for the 102 fish removed by the sport fishery in the Lower Monumental Pool right below Little Goose Dam in June. The numbers of fish not accounted for between projects does not appear to raise any concern at this time given the variability in numbers among projects.

**Table 1. 2005 Adult Passage at Snake River Dams from mid-June to July 4, a time period when adult passage was disrupted at Little Goose Dam.**

Dams	Count Dates	Chinook Adult	Chinook Jack	Steelhead
<b>Ice Harbor</b>	6/16-7/1	5,164	484	1,225
<b>Lower Monumental</b>	6/17-7/2	4,827	348	1,095
<b>Little Goose</b>	6/18-7/3	4,423	426	616
<b>Lower Granite</b>	6/19-7/4	4,381	456	542

Table 2 presents the conversion percentages (percentage of fish from the downstream dam passing the upstream dam) between the Snake River projects for 2005 to-date and compares those percentages to past years. As can be observed from the table there is a considerable variation in conversion percentages among years for any of the projects using traditional counts. From these data it appears that the conversion percentage observed thus far in 2005 is not different from what has been observed from the past five years when summer spill did not occur at the projects.

**Table 2. 2000 to 2004 Adult Chinook Passage at Snake River Dams using Traditional Summer Chinook Count Dates. Traditional counting dates for summer chinook begin on 6/12 at Ice Harbor, 6/14 at Lower Monumental, 6/16 at Little Goose and 6/18 at Lower Granite. The 2005 Count data is from traditional start date to July 6, 2005. (%) = Number of fish counted at downstream dam and passing next upstream dam.**

Dams	2005	2004	2003	2002	2001	2000
<b>Ice Harbor</b>	7,549	13,173	20,742	26,607	15,270	4,241
<b>Lower Monumental</b>	6,624 (87.8%)	10,593 (80.4%)	18,718 (90.2%)	23,744 (89.2%)	19,287 (126.3%)	4,680 (110.4%)
<b>Little Goose</b>	5,461 (82.4%)	9,304 (87.8%)	14,340 (76.6%)	20,854 (87.8%)	15,929 (82.6%)	4,160 (88.9%)
<b>Lower Granite</b>	5,024 (92.0%)	8,767 (94.2%)	16,422 (114.5%)	22,159 (106.3%)	13,735 (86.2%)	3,939 (94.7%)

### PIT Tagged Fish Data

There is a two-year record for the conversion percentage for PIT tagged fish between Ice Harbor and Lower Granite Dam. The data set used was fish that were detected at Ice Harbor Dam and subsequently detected at Lower Granite Dam. Fish that were detected at Ice Harbor, but were bound for the Yakima River were removed from the data set as well as those bound for the Tucannon River. In addition, fish that were tagged at Ice Harbor Dam were removed so as not to include handling and tagging effects. In 2003 the conversion percentage was 94.05% and in 2004 the conversion percentage was 93.14%.

The 2005 conversion percentage to Lower Granite Dam thus far of all PIT tagged fish that were detected at Ice Harbor Dam between 6/15/2005 and 7/1/2005 is 87.93%. However, keep in mind that this is a minimum conversion percentage since fish from this group will continue to be detected for the next couple of weeks. In 2003 the last fish detected at Lower Granite Dam for the same time period (6/15 – 7/1) at Ice Harbor Dam was July 17<sup>th</sup> and in 2004 it was July 21<sup>st</sup>.

In addition to the overall conversion percentage we also looked at the conversion percentages for the detections at Ice Harbor Dam grouped on a daily basis. The sample sizes are small and consequently one missing fish can cause the percentage to decline, but it appears from the data that the daily conversions percentages are similar to what was observed for the 2003 and 2004 data. Again, these data are preliminary and the percentages are expected to increase as more fish are expected to pass Lower Granite Dam from these groups.

**Table 3. Percent of fish detected at Lower Granite Dam of daily group originating at Ice Harbor Dam and the available historic data for the same time period.**

<b>Date</b>	<b>Daily Detection at Ice Harbor</b>	<b>Number Detected at Lower Granite</b>	<b>% Conversion</b>
6/15/2005	12	12	100.00%
6/16/2005	19	17	89.47%
6/17/2005	18	17	94.44%
6/18/2005	18	17	94.44%
6/19/2005	7	7	100.00%
6/20/2005	7	6	85.71%
6/21/2005	10	6	60.00%
6/22/2005	8	8	100.00%
6/23/2005	13	12	92.31%
6/24/2005	12	11	91.67%
6/25/2005	5	5	100.00%
6/26/2005	6	5	83.33%
6/27/2005	1	1	100.00%
6/28/2005	18	16	88.89%
6/29/2005	10	9	90.00%
6/30/2005	6	2	33.33%
7/1/2005	4	2	50.00%
<b>Total</b>	<b>174</b>	<b>153</b>	<b>87.93%</b>
<b>6/15-7/1 2004</b>	<b>204</b>	<b>190</b>	<b>93.14%</b>
<b>6/15-7/1 2003</b>	<b>185</b>	<b>174</b>	<b>94.05%</b>

In conclusion, the delay in passage at Little Goose Dam due to the high volume of spill at that project relative to river flow appears to have been addressed by the reduction of daytime spill at that project to 30% of total flow. In addition, given the variability in traditional counts among years and the PIT tagged fish conversion percentages observed, there does not at this time appear to be an issue with delay or with survival of adult fish this year when the data are compared to past years.