



# FISH PASSAGE CENTER

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## MEMORANDUM

TO: Joan Dukes, Chairperson  
Fish Passage Center Oversight Board

FROM: Michele DeHart

DATE: October 5, 2005

RE: Response to PNGC and Northwest River Partners Comments on FPC  
Preliminary In-River Survival Analysis

In August you requested information regarding the passage of subyearling fall Chinook through the Snake River. We discussed concerns that the passage timing of fall Chinook had occurred in such a way that the court ordered summer spill program had not started until the majority of fish had passed the Snake River projects. In response to your questions we provided a summary analysis (memorandum dated August 16, posted at [www.fpc.org](http://www.fpc.org)) of the passage distribution and timing of the sub-yearling fall Chinook migration. In that memorandum we pointed out that the run-at-large passage timing for fall Chinook reflected the early releases of hatchery fish in late April and May. We also pointed out that PIT tag data indicated that fish collected since August 1, were of wild natural origin. On September 12, in response to several requests for preliminary estimates of in-river survival, we provided a preliminary analysis of the in-river survival of juvenile fall Chinook through September 1. Subsequently, we received a request to repeat the analysis to include all fish that had arrived at Lower Granite Dam through August 31, the end of the spill period. That preliminary analysis was distributed on September 16; the survival estimates did not change appreciably from the first analysis.

We have not received any technical comments on this analysis; however, we have seen criticism of the FPC's analyses reported by the media. These accounts are similar to two documents posted at [www.pngcpower.com](http://www.pngcpower.com), which are attached. This memorandum reviews the technical arguments presented in the PNGC-posted documents, which appear to be authored by a group calling itself "Northwest River Partners." Our overall conclusion after review of the PNGC comments is that the comments are primarily directed at the court ordered spill program, rather than the FPC analysis. The FPC analysis is limited to the question of estimating in-river survival under the spill and no spill conditions which occurred in 2005. PNGC and the

Northwest River Partners (NRP) are always welcome to raise their concerns and questions directly to us.

In the following we have addressed each NRP and PNGC concern specifically:

**The FPC answers only part of the scientific question of how the court ordered spill affected Snake River Fall Chinook survival.**

The FPC was asked to provide a preliminary summary of summer passage for 2005 in the Snake River. The FPC stated that the analysis was preliminary seven different times in the memo. The memo stated that the final analysis would be in the FPC's annual report, which is the ordinary course of business. We recognize that adult returns will provide additional information on the effect of passage conditions provided this summer. As requested, the FPC analysis does address the comparison of juvenile in-river survival before and after the initiation of the court ordered spill program.

**The FPC report focused on survival in only the Snake River, ignoring survival through the lower Columbia River.**

- The FPC analysis was in response to specific requests to develop a preliminary estimate of the effect of the summer spill program. The survival estimation methodology used by the FPC, which has been peer reviewed and accepted by the region, (Burnham et al, and Cormack, Seber, Jolly), requires tag recaptures at John Day and Bonneville dams to estimate survival to McNary Dam. Survival estimates below McNary Dam are difficult to obtain because of PIT tag recapture limitations.
- The FPC analysis and survival estimates were based upon recapture of PIT tags at Bonneville and John Day dams.
- To overcome tag recapture limitations, large numbers of PIT tagged fish are needed to estimate survival of Snake River migrants through the Lower Columbia. Empirically derived estimates of survival to Bonneville Dam would require a tag recapture site below Bonneville. In 2005 there were not enough tags released or recapture sites available in the Lower Columbia to estimate survival to Bonneville or John Day dams consistent with Burnham/Cormack methodology.

**The FPC report analyzes survival for only four weeks of the over ten week court ordered spill omitting roughly 65% of the program.**

- The FPC analysis utilized all of the PIT tag recaptures that had occurred at John Day and Bonneville dams (recapture sites) through September 1, the fish travel time between Lower Granite and Bonneville limited the first (memo dated Sept.12) analysis to fish that passed Lower Granite Dam (release site) by July 15. The second analysis (memo dated September 16), which included fish passing Lower Granite Dam (release site) during the entire spill period through August 31, showed the same juvenile survival estimate.

**The FPC report only analyzes survival of fish migrating in-river and ignores the 98% survival rate of transported fish.**

- The FPC memo estimated the survival of in-river migrants that passed in spill versus those that passed without spill. The memo said nothing about adult returns.
- There is no technical or scientific basis for the 98% survival rate statement; it is an assumption with no statistical rigor. The NOAA white papers discuss this matter more fully. Moreover, delayed mortality of transported fish appears to very high.
- The FPC did not conduct a comparison between transported and in-river migrants. The effects of transportation cannot be analyzed until the adult fish return, which is not going to be for a few years. Interest was expressed regarding the in-river survival of juveniles this year. The Fish Passage Center analysis addresses that question.

**The FPC report presents a broad range of uncertainty, from 44% to 103% for the actual survival rate of Fall Chinook in the Snake River.**

- The FPC presents the confidence intervals and the data and the methods in the appendix so that the analysis is transparent and to avoid misrepresentation. The confidence intervals do not overlap ( $\alpha = 0.1$ ), which means the difference in survival between spill and no spill is significant.

**The great majority of salmon had already migrated past the dams in question by the time spill started.**

- This comment fails to recognize that the early release of hatchery fish, determined the early passage timing of the run-at-large.
- The groups used in the FPC analysis were migrating both through the spill and no spill period (the data was attached to the memo) so the NRP and PNGC statement is incorrect relative to this analysis.
- The run-at-large timing is heavily influenced by the passage of hatchery fish and does not represent the timing of wild, natural fall Chinook.
- Timing of the court order was accounted for in the FPC analysis. The NRP and PNGC comment seems to argue that spill should have commenced earlier. This again is irrelevant to the FPC analysis which only addressed what actually happened, not what should or could have happened.

**The FPC report suggests that 10% of juvenile Snake River fall Chinook experienced court ordered spill at a cost of about \$80 million. However, survival for these fish to below Bonneville Dam was not reported in the FPC report leaving overall system survival as a significant unknown.**

- The FPC analysis did not address the cost of spill or the merits of the court order.
- The FPC memo does not address the run-at-large, other summer migrating runs (e.g. Hanford Reach) or any percentage of the hatchery or wild populations.

- The passage index is mathematically irrelevant to the survival rate estimates reported in FPC analysis. The passage index concerns appear to be directed to concerns about the timing of the court ordered spill in relation to the run at large at Lower Granite Dam.
- Natural/wild fish Snake River fall Chinook are listed under the ESA because their numbers are small. Because their numbers are small, this population does not appreciably affect the passage timing of the run-at-large, since the small numbers of natural origin fish are statistically overwhelmed by hatchery fish.
- The FPC did not estimate system survival (i.e. survival from Lower Granite to Bonneville Dam) because insufficient numbers of tagged fish were released and the recapture site capabilities downstream of McNary Dam are limited. The FPC estimated reach survival from Lower Granite to McNary Dam.
- The FPC has conducted a separate analysis of the passage timing based on the PIT tag recaptures. This analysis demonstrates that 40% to 60% of wild/natural Snake River fish passed Lower Granite Dam after the initiation of the spill program. This proportion does not include Clearwater River migrants which migrate later than fall Chinook of Snake River origin. Including fall Chinook of Clearwater origin in this estimate will increase the proportion of fish that migrated after spill was initiated.
- Juvenile fall Chinook travel time between Lower Granite and McNary dams averaged 18 days in 2005. This means that some portion of fish arriving at Lower Granite dam prior to June 20 when summer spill started, were migrating in the reach between Lower Granite and McNary dams and benefited from the court ordered spill program at Little Goose and Lower Monumental dams. To illustrate this point, on June 20 when court ordered spill started at the upstream projects, the percent of Snake River wild/natural PIT tagged fish which had arrived at McNary Dam was only 1%.

## **Conclusion**

Overall, the NRP and PNGC comments primarily appear to respond to the court-ordered spill program that occurred this year. The comments do not identify technical inaccuracies in the FPC analysis of survival. The FPC's estimates of juvenile in-river survival are sound and use the estimation methodology that has been peer reviewed and accepted and employed within the Region. The data were presented with detailed and transparent descriptions of the methods and results. The FPC's analysis did not make management recommendations or attempt to resolve larger questions about the efficacy of transportation. Rather the FPC analysis provides preliminary technical insights to the effects of the court ordered spill on juvenile fall Chinook in the Snake River. We encourage both the NRP and PNGC to contact us directly when they have specific technical questions regarding an analysis that we conducted or survival estimation methodology. We are more than happy to discuss their questions at any time.

Northwest River Partners Response  
Fish Passage Center Report  
September 13, 2005

There are several issues with the Fish Passage Center (FPC) report that raise serious questions about its accuracy and usefulness. The FPC report is a partial and preliminary analysis that does not scientifically support its conclusions. Some shortcomings of the report are highlighted below.

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- The FPC report only addresses a part of the scientific question of how the court-ordered spill affected Snake River Fall chinook survival.
  - The FPC report focused on survival in only the Snake River, ignoring survival through the lower Columbia River.
  - Survival in the lower Columbia River is typically lower due to warmer river temperatures, lower flows and increased predation.
  - The FPC report analyzes survival for only four weeks of the over ten week court-ordered spill program, omitting roughly 65% of the program.
  - The FPC report only analyzes survival of fish migrating in-river, and ignores the 98% survival rate of transported fish.
  
- The FPC report presents a broad range of uncertainty, from 44 to 103%, for the actual survival rate for Fall Chinook in the Snake River.
  
- The great majority of salmon had already migrated past the dams in question by the time spill started.
  - According to FPC data on fish passage, over 90% of Snake River fall chinook had already migrated past Lower Granite Dam by the time the court-ordered spill was implemented, this information was not disclosed in the FPC report.
  - The FPC report suggests that about 10% of juvenile Snake River Fall Chinook experienced court-ordered spill at a cost of about \$80 million. However, survival for these fish to below Bonneville Dam was not reported in the FPC report, leaving overall system survival as a significant unknown.

Northwest River Partners Statement  
On  
Fish Passage Center Preliminary Analysis of September 13, 2005

Recently, the Fish Passage Center (FPC) issued a preliminary analysis of in-river survival rates of Snake River fall Chinook from court-ordered spill at federal dams this summer. It must be pointed out that the FPC work is very preliminary and has not been thoroughly analyzed or peer-reviewed. The data behind the report has not been provided.

The FPC report is an incomplete look at the issue of spill and salmon survival through the hydrosystem this summer. For example, the report only looks at survival in the Snake River, ignoring the Columbia River. It does not compare in-river salmon survival to survival of transported salmon which is at the heart of the scientific debate. It also only covers the first four weeks of the spill leaving out the last ten Weeks. Survival in the late summer timeframe is typically far lower as a result of high temperatures and predation. That these late summer effects have been ignored suggests a selective use of the data.

Unfortunately, the report's results, incomplete as they are, have been provided to the press and media in the region and are being portrayed as evidence that the spill program is working. This approach does a grave disservice to the people who support and care about the protection of salmon, including Northwest River Partners members. This issue merits an approach that is thoughtful, scientifically rigorous and is based on a complete set of data and facts.

Northwest River Partners supports restoration of the region's salmon resources based on the best possible science and in ways that optimize the investment this region is making. This preliminary, incomplete report does not promote good science or objective findings and should not be taken as credible evidence to support an \$80 million spill program.