



FISH PASSAGE CENTER

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MEMORANDUM

TO: Ed Bowles, ODFW
Bob Heinith, CRITFC
Michele DeHart

FROM: Michele DeHart

DATE: December 16, 2004

RE: ISAB Findings from the Reservoir Operations/ Flow Survival Symposium,
November 9-10, 2004

In response to your requests the Fish Passage Center staff has reviewed the ISAB findings from the November 9-10 symposium. In addition, we have reviewed some of the relevant papers, which were presented and relied upon in the ISAB review. In accordance with our normal FPC procedures, we have provided copies of these comments to the agencies and tribes and posted them on the FPC web site. Our conclusions are:

- The ISAB findings do not support the implementation of the Montana proposal
- The Reservoir Operations/Flow Survival Symposium was designed to address incremental impacts, which inappropriately narrow the scope of questions considered and limited presentation of key information. The weight-of-evidence approach was not used for a rigorous evaluation and testing of various hypotheses.
- The ISAB concluded that no existing models seem adequate for evaluating the flow effects of the Montana proposal and that an experimental trial of Montana's proposed flow regime would be unlikely to reveal biological effects. These two facts together preclude any determination that the impact of the Montana proposal on listed fall Chinook is inconsequential.
- The ISAB findings are limited in scope due to the structure of the NPCC symposium. However, the ISAB findings noted the state of uncertainty relative to fall Chinook and several key research questions that should be pursued.

General Comments

Our overall conclusion after reviewing the ISAB report is that it does not support the implementation of the Montana operations proposal. Instead the ISAB report highlights identifies several areas in which existing models and existing

information is inadequate to conclusively determine the hydrologic or biological impact of the Montana proposal. In addition, the ISAB states that an experimental trial of the operation as proposed by Montana is unlikely to provide sufficient information regarding incremental benefits. The ISAB states that though the impacts of the proposed Montana operation are likely to be small, they highlight the findings of the National Research Council (2004), which warned of the cumulative risk of many relatively minor changes with individually small effects. The ISAB review clearly recognizes that this is a possibility with the Montana proposal. The ISAB report is a good summary of the issues surrounding fall Chinook migration management including flow, transportation, water temperature and a brief mention of the inadequacy of one of the offsets proposed for summer spill reduction in 2004.

Because the ISAB report is a summary of findings from the Reservoir Operations/Flow Survival Symposium, it therefore is fundamentally shaped by the structure, organization and design of the symposium itself. Although the symposium as designed could only describe the potential effects of the Montana proposal, it did not create a strong case for implementation of the Montana operation. The states and tribes fishery agencies and the US Fish and Wildlife Service provided specific technical recommendations to the Northwest Power and Conservation Council regarding the development, structure and content of the NPCC symposium (States and Tribes Oct. 18, 2004, attached). In addition, the agencies and tribes recommended that the NPCC formally consult with the affected fishery managers on objectives, specific questions, analytical methods and format of the symposium. The agencies and tribe's recommendations were disregarded. The agencies and tribes recommended a decision analysis framework utilizing a "weight-of-evidence" approach, which would have allowed for a rigorous evaluation of the strengths and weaknesses of various factors affecting survival including flows at each life stage. Many of our following, specific comments address issues that were not and could not be addressed or presented for ISAB consideration due to the format and structure of the NPCC symposium. Nonetheless they are significant and are relevant to some of the findings by the ISAB.

Specific Comments

Yearling fall Chinook migrants, "holdover fish"

The ISAB findings made several references to an unpublished manuscript by William Connor (USFWS) entitled "Two alternative juvenile life histories for fall Chinook salmon in the Snake River basin." The ISRP findings highlight the Connor presentation suggesting that the large adult contribution from migrants exhibiting the reservoir (holdover) life history suggests that using flow augmentation to speed migration should be reassessed. A "weight-of-evidence" approach would have illuminated specifics of the Connor analysis that might have affected the ISRP findings. **The Connor manuscript and the available data on "holdover" migrants do not indicate that flow augmentation does not improve survival.**

One of the main concerns of the Montana proposal was the effects of flow reductions on summer-migrating ESA-listed juvenile fall Chinook salmon from the Snake River. It has been estimated that 98% of wild fall Chinook from the Snake River and 47% from the Clearwater River migrate as subyearlings according to PIT-tag studies conducted by William Connor of the U.S. Fish and Wildlife Service (Connor et al. 2002).

Because flow reductions would occur during the summer when these subyearlings are migrating and overall flows are low and temperatures are high, adopting the Montana proposal could detrimentally affect these fall Chinook. However, despite the evidence for the majority of the fall Chinook population migrating as subyearlings, the ISAB chose to emphasize the soon-to-be-published work by William Connor that is reliant on unvalidated scale pattern analyses. The recent study by Connor found that on average, 59% of the wild fish migrated as subyearlings, though the scale estimates showed considerable variability over time (Figure 1). The results from this scale analysis and past PIT-tag studies by Connor are in direct conflict with each other and the estimates from each, aligned by brood year, show no correspondence (Figures 2 and 3). The only way that both sets of information can be true is if dam, hydrosystem operations and/or the currently implemented transportation program kill a large component of the subyearling migrants, such that only yearling migrants the next spring survive to return as adults. **If this is the case, then this does not imply that the yearling migration strategy should be supported at the expense of the subyearling migrants, especially given the propensity for yearling-migrant males to return as mini-jacks (40% of the hatchery males that migrated as yearlings returned as mini-jacks, according to the unpublished Connor study)** Rather, it underscores the need to provide suitable migration conditions so that Snake River fall Chinook maintain their historical migration strategy, which was composed of nearly all subyearling migrants. The scale data also present contradictory information in terms of the importance of the subyearling migration strategy between wild and hatchery fish (Figure 4). For example, when the wild population shows 70-80% of the population migrating as subyearlings, the hatchery population can show anywhere from 20-65% of the population migrating as subyearlings. Though the ISAB was presented information reporting higher SARs for yearling migrants, the mortality occurring between the sub-yearling and yearling life stage was not provided or addressed.

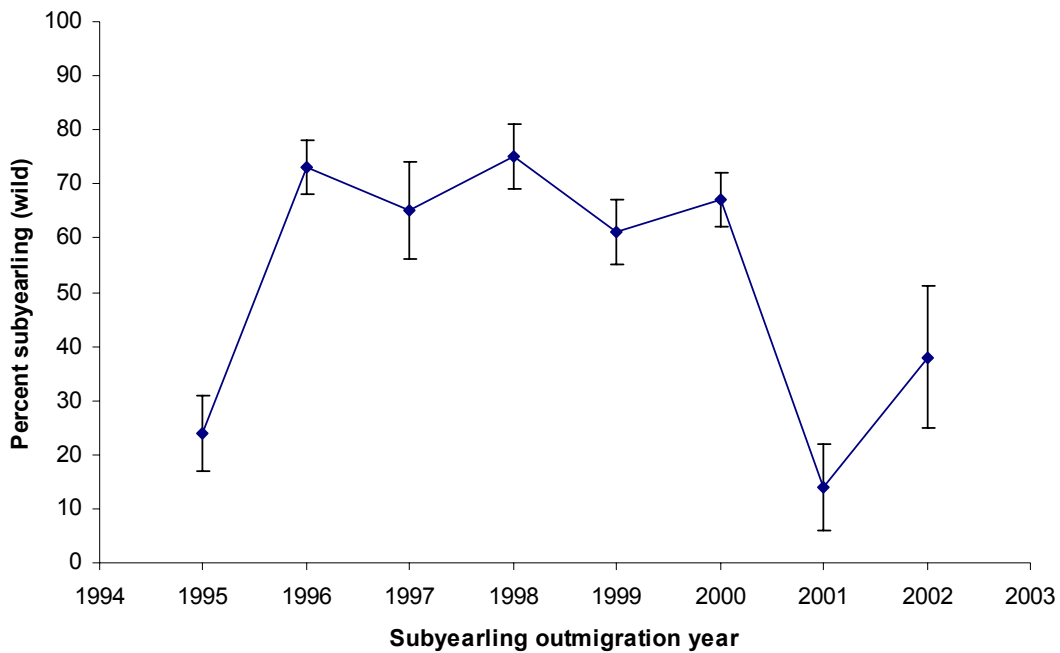


Figure 1. Percent of wild fall Chinook migrating as subyearlings based on scale pattern analyses by Connor et al. (in press).

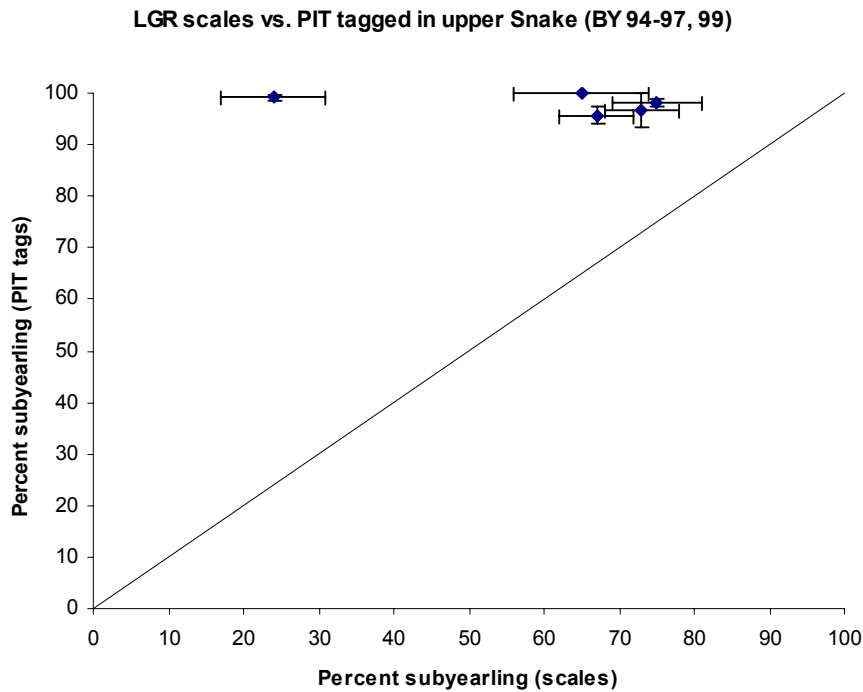


Figure 2. Percent of wild fall Chinook migrating as subyearlings according to PIT-tagged fish captured in the upper Snake River (y-axis) versus percent migrating as subyearlings according to scale pattern analyses on fish collected at LGR (x-axis). The data are aligned by brood years using the information in Connor et al. (2002) and Connor et al. (in press).

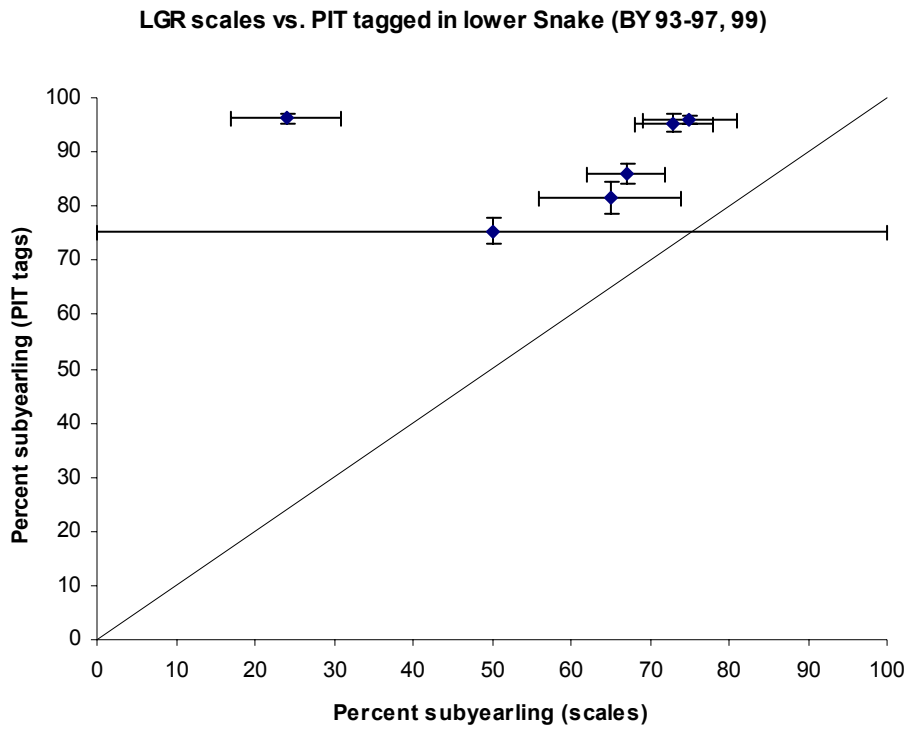


Figure 3. Percent of wild fall Chinook migrating as subyearlings according to PIT-tagged fish captured in the lower Snake River (y-axis) versus percent migrating as subyearlings according to scale pattern analyses on fish collected at LGR (x-axis). The data are aligned by brood years using the information in Connor et al. (2002) and Connor et al. (in press).

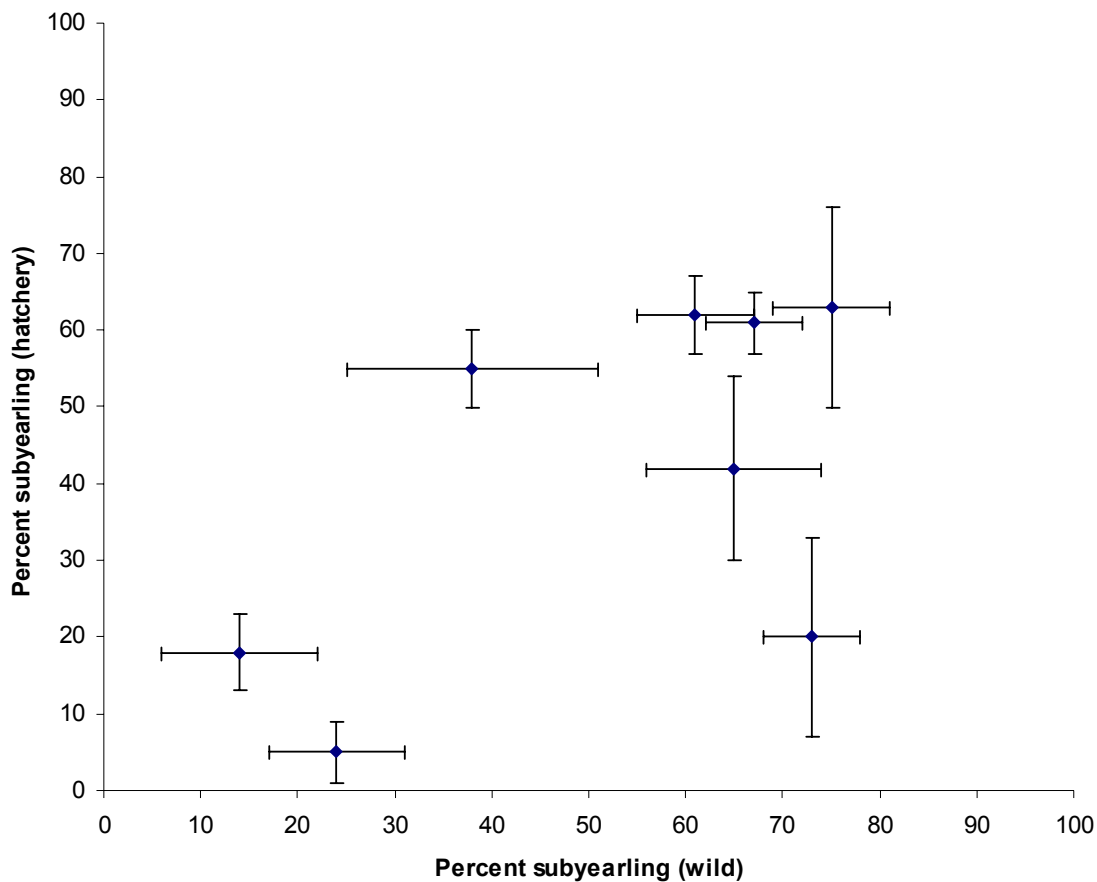


Figure 4. Percent migrating as subyearlings based on scale pattern analyses on wild and hatchery fall Chinook scales collected at LGR by Connor et al. (in press). The estimates are aligned by common brood year.

Higher summer flows and velocities

The symposium did not address the prevailing question of the effects of higher summer flows and velocities and their potential effects on fall Chinook travel time, migration timing, survival and life history. Specifically the effects that low flows have on the number and proportion of fall Chinook, which out-migrate as yearling migrants.

Survival

The ISAB findings, based upon the symposium presentations state that the impacts of the Montana proposal are likely to be small, while emphasizing the risk of cumulative affects of small changes. The ISAB findings regarding impacts of flow are the result of the presentations at and structure of the symposium, which were not designed to conservatively illuminate the potential risk to juvenile survival associated with the implementation of the Montana proposal.

The ISAB makes the case for a small impact to anadromous salmonids in the mid- and lower Columbia River due to the Montana plan; however, these results were based on using the 50-year average flow level. The ISAB should have considered flows at the

lower end of the 50-year record to provide a more conservative measure of potential impacts. Because the change in mean survival per unit flow is greater at the lower flows, they would have computed a greater impact than reported.

Determining changes in smolt survival due to small incremental changes in flow is an inappropriate use of the survival/flow plots presented by NOAA and the survival/flow regression curve presented by FPC. The 0.01% (1 mortality in 10,000 smolts) mortality rate as a mean response of an 8.3 kcfs drop based on a 50-year average flow level will underestimate the losses expected when low flow conditions occurred under the Montana plan.

The problems with the unvalidated SIMPAS and CriSP models are noted by the ISAB; however, they still utilize the models to conclude that the survival change was low (<1%) and of inconsistent sign. The inconsistent sign outcome simply reveals that there was large noise about the model results and underscore the shortcomings of SIMPAS and CRiSP. Using low flow conditions in the modeling exercise would likely show a consistent reduced survival with the Montana plan.

Transportation of Fall Chinook

The symposium and resulting ISAB review did not address the key issue of the transportation of fall Chinook juveniles in the Snake and Columbia Rivers. The implementation of the transportation program affects the potential impact of operations such as the present Montana proposal. Smolt-to-adult return rates for transported versus in-river migrating fish are disappointing (FPC April 6, 2004 memo). Determining the actual benefits and effects of transportation are key to the future management of fall Chinook passage and flow issues. There is significant evidence that a spread-the-risk policy would be prudent for fall Chinook. Modifications of the juvenile fall Chinook transportation program, such as spread-the-risk, would result in larger numbers of fall Chinook migrating in-river, which would be impacted by the reductions in and shifts of flow resulting from the Montana proposal.

ATTACHMENT:

State, Federal and Tribal Fishery Agencies Joint Technical Staff

*Columbia River Inter-tribal Fish Commission
Idaho Department of Fish and Game
Nez Perce Tribe
Oregon Department of Fish and Wildlife
Shoshone-Bannock Tribes
US Fish and Wildlife Service
Washington Department of Fish and Wildlife*

October 18, 2004

Ms. Judi Danielson, Chair
Northwest Power and Conservation Council
450 West State
PO Box 83720
Boise, ID 83720-0062

Mr. Doug Marker
Northwest Power and Conservation Council
Fish and Wildlife Division Director
851 SW 6th Ave., Suite 1100
Portland, OR 97204-1348

Dear Ms. Danielson and Mr. Marker:

Re: November 9-10 Flow-Survival Symposium

It is our understanding that the Northwest Power and Conservation Council (Council) and NOAA Fisheries are planning a symposium for November 9 and 10, 2004 to examine how changes in operations of Libby and Hungry Horse dams may affect flow and survival in the mainstem Columbia below Chief Joseph Dam. We concur with the need for federal, state, and tribal scientists to explore the biological implications of changes in Libby and Hungry Horse operations during summer as anticipated in the Council's 2003 Mainstem Amendments to the Columbia Basin Fish and Wildlife Program (Program) and as discussed in the July 19, 2004 letter from NOAA Fisheries to the Council. We are concerned, however, about the Council organizing and structuring this symposium without the formal involvement of all of the regional fish managers with vested interest in this issue.

A strong body of work from the regional fish managers and the National Research Council exists on the topic of flow, survival and incremental water withdrawals in the Columbia River Basin State, Federal, and Tribal Anadromous Fish Managers Comments on the Northwest Power Planning Council Draft Mainstem Amendments as they Relate to Flow/Survival Relationships for Salmon and Steelhead, January 2003; The effects of mainstem flow and water velocity on salmon and steelhead populations of the Columbia River, Presentation to the National Research Council, IDF&G, ODFW, USFWS, FPC, March 2003; and Managing the Columbia River: Instream Flows, Water Withdrawals, and Salmon Survival, Committee on Water Resources Management, Instream Flows, and Salmon Survival in the Columbia River Basin, National Research Council, 2004). These works should be the starting point for framing the workshop (we have attached the former two documents and the web link for the latter document for your record. Link to NAS report: <http://www.ecy.wa.gov/programs/wr/cr/crinsr.html>).

The Council should formally consult with the affected fishery managers on the objectives, specific questions, analytical methods, and format of the symposium. The current list of questions posed for the symposium is extremely narrow in scope, and appears to be directed at addressing the questions based on an incremental analysis of the effects of flow on juvenile salmonid survival utilizing SIMPAS and other models. We believe an examination of these issues using only these deterministic single life cycle models is not sufficient, as these models are inadequate to address the complexities and uncertainties of the effects of summer flow on the entire life cycle survival of anadromous fish below Libby and Hungry Horse dams. Applying this approach, which is parallel to the contested method used by the Council, NOAA Fisheries, and Action Agencies to evaluate effects of summer spill reductions, will only promote additional controversy, resulting in a lack of regional support of findings from the symposium. The Council should strive to avoid creating additional controversy by facilitating a broader technical scope. Also, failing to include in the rigorous evaluation of changes in Libby and Hungry Horse operations the effects on resident fish above and below projects leaves out a decisive element needed for a comprehensive evaluation as is anticipated in the Council's Program.

Based on our review of the announcement for the symposium, it appears that symposium participants will be asked to share their responses on the questions that will be summarized in a briefing document developed by the Council. We recommend that the symposium be patterned after a decision analysis framework using a "weight of evidence" approach whereby the strengths and weakness of the various factors affecting survival including flow are evaluated for each life stage of fish below the projects. We specifically recommend that the format used in the Comparative Survival Study workshop conducted February 11-13, 2004, be followed to provide a scientifically sound basis for assessing effects of changes in Libby/Hungry Horse project operations on fish.

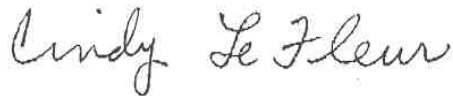
We stand ready to assist the Council in planning and conducting this important symposium that will increase the region's collective understanding of the implications of the Council's Program on fish and hope that our recommendations are useful in

formulating the symposium. We agree that changes to the operations of Libby and Hungry Horse reservoirs need to be comprehensively examined to make sure that the modified operations proposed under the Council's program do not increase the risk to Columbia River anadromous or resident fish, particularly pursuant to ongoing FCRPS consultation and expectations for further recovery planning. Flow augmentation is an extremely important component of anadromous fish recovery and restoration. Any changes to operations of Libby and Hungry Horse need to be comprehensively evaluated for compatibility with the NOAA Fisheries and USFWS BIOPs and to assure that the modified operations do not impede the progress towards recovery, achieving biological objectives and restoring sustainable fisheries.

Sincerely, STFA



Dave Statler, NPT



for Bill Tweit, WDFW



Ron Boyce, ODFW



Howard Schaller, USFWS



Keith Kutchins, SBT



for Sharon Kiefer, IDFG



Rob Lothrop, CRITFC

Cc: Bob Lohn NOAA Fisheries