FISH PASSAGE CENTER

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MEMORANDUM

TO: Ron Boyce, ODFW
Bob Heinith, CRITFC

FROM: Michele DeHart

DATE: November 30, 2010

RE: 2011 Operations

In response to your requests the FPC staff reviewed the documents you provided: the proposed operations and biological information developed by NOAA Fisheries and the Bonneville Power Administration for proposed 2011 operations. Following are our review; we are providing comments for your consideration. Many of the specific operations proposals discussed in the subject materials have been addressed in previous FPC memorandums and analyses. These have been incorporated by reference and can be found on the FPC website at www.fpc.org

- Overall, the information provided by NOAA provides a strong case for continuation of the 2010 river operations for spring and summer of 2011.
- We agree with the conclusions by NOAA that the juvenile survival for in-river migrants has increased substantially, particularly for sockeye and steelhead with the recent years FCRPS court ordered fish passage operations for the spring.
- In-river survival for juvenile summer migrants has also increased in recent years with the court ordered fish passage operations.
- The NOAA presentation of material, from the CSS Draft Annual Status Report for 2010 discusses smolt-to-adult returns rates for Snake River wild Chinook and wild steelhead. However, NOAA neglects to include the following points from the CSS 2010 annual report.
    - Smolt-to-adult return rates (SARs) for transported juvenile fish have increased under the court ordered operations simultaneously with significant changes in the transportation program. The percentage of smolts transported has been significantly decreased in recent years, by delaying the beginning of

transportation, and providing spill for fish outmigrating r in-river. The gray background in the plot used by NOAA indicates the years with these management changes in the juvenile fish transportation program.

  - NOAA has presented information to the RIOG indicating that steelhead in-river survival in 2009 and 2010 was higher than any other year in the recent in the series. The CSS annual report includes analyses and discussion of the relationship between Transport Benefit Ratios (TIR) and in-river juvenile reach survival estimates. The relative benefit of transportation, in the analyses of all transported steelhead and Chinook, in terms of "Transport: In-river" ratios (TIRs) directly related to in-river migration conditions and in-river survival. As in-river migration conditions have improved with decreased Water Travel Time (increased flow) and increased spill for fish passage, in-river survival has increased and TIR has decreased. The TIR and reach survival relationship indicates that when in-river steelhead survival is above approximately 55%, transportation will be detrimental.
  - The CSS analyses indicate that survival rates for yearling Chinook, steelhead and sockeye respond to changes in hydrosystem management actions, with increased in-river survival predicted to occur when water transit times are reduced and/or spill percentages are increased.

- NOAA states that it appears that the SARs from 2006-2008 for wild Chinook and wild steelhead have generally equaled the average expectation from COMPASS model runs, however these SARs of 0.9% and 1.8% cited by NOAA are below the NPCC Program goals of 2-6% (NPCC 2009)..
- NOAA presents a color coded summary of ocean conditions without discussing the relationship of freshwater juvenile passage conditions on (SARs). Although, ocean conditions are important and affect (SARs), ocean conditions do not impact the freshwater passage strategy. The red, yellow or green status of ocean conditions does not change the juvenile freshwater passage strategy objective of maximizing fresh water survival to whatever extent possible. In order to benefit from green ocean status or to contend with red ocean status, the maximum number of outmigrating smolts must reach the ocean alive and in good condition.
- NOAA discusses new analyses and new information and concludes that the addition of Surface Passage Routes has increased the median migration rate and survival for in-river migrants .NOAA neglects to include a discussion of the impacts of spill for fish passage operations and their impact on juvenile fish travel time and survival. CSS analyses of the long time series of data indicates that spill and flow are two of the primary variables affecting smolt-to-adult return. Research evaluations have shown that effectiveness of surface passage devices is related to the proportion of river flow and spill proportion.
- In NOAA's discussion of new analyses, they have not included a discussion of published studies, such as Petrosky and Schaller (2010) which indicates smolt-to-adult and first year ocean survival rates were associated with both ocean conditions and river conditions. Specifically reduced upwelling in the spring, slower river velocities during the smolt migration or multiple passages through powerhouses at dams. In addition, NOAA did not discuss multiple analyses presented at the Corps of Engineers delayed mortality workshop and the results in the CSS 2010 Annual Status Report indicating that delayed mortality is occurring for juvenile fish passing through powerhouse bypass

systems, which implies that spill levels should be increased where possible within the dissolved gas limitations.

- NOAA's presentation to the RIOG did not include any discussion of straying issues associated with adult returning salmon and steelhead that were transported during their juvenile outmigration. The 2010 CSS Annual Status Report concluded that adult upstream migration success rate is decreased for salmon and steelhead that were transported as juveniles. Steelhead and Chinook that were transported as juveniles exhibit higher straying rates during their upstream migration. Straying rates of adult steelhead has been identified as one of the limiting factors in the recovery of some middle Columbia ESA-listed populations.

Summer Fish Passage Operations

- NOAA discusses summer operations in terms of PIT- tagged juvenile fall Chinook tagged in the Upper Hells Canyon Reach, Lower Hells Canyon Reach and the Clearwater River. On the basis of these PIT tags, NOAA discusses the 10% 50% and 90% point of passage at Lower Granite for PIT tagged fall Chinook. NOAA's use of these PIT tag data to assess passage timing, and duration, is not appropriate for the following reasons (FPC memorandum, August 27, 2008. www.fpc.org).
    - PIT tagging on these groups is not representative of the fall Chinook population. PIT tagging is limited by fish size and accessibility. Smaller fish cannot be PIT tagged and migrate later, this part of the passage population distribution would not be represented in the PIT- Tagged groups utilized by NOAA in their discussion of sub-yearling Chinook timing at Lower Granite.
    - Protecting the tails of the fish passage distribution is, recognized, as important for sustaining the diversity of life histories, particularly for fall Chinook.
    - The passage distribution of the fall Chinook run at large is dominated by large hatchery groups released early in the passage season. The magnitude of these releases may obscure timing of wild stocks of fall Chinook which that historically had a later passage distribution than the present hatchery releases.
- We are unaware of a sound biological basis for choosing a collection count of 300 sub-yearlings as the trigger to end summer spill at the Lower Snake Projects. Based on our analysis of the run-at-large, (FPC memorandum, August 27, 2008. www.fpc.org) we found that the population of sub-yearling Chinook passing LGR in August can be substantial. Furthermore, since flows are usually lower in August, the set volume of spill at LGR equates to a higher spill proportion during these periods of low flow. For example, when flows are approximately 30 Kcfs and LGR is spilling 18 Kcfs (as specified in the 2008 BiOp), a collection count of 300 fish could equate to as many as 9,000 sub-yearling Chinook passing the project. Our analysis of wild Snake and Clearwater River Chinook suggests that a substantial portion of the fish passing LGR in August are wild and, therefore, eliminating spill in August would likely have a greater impact on these wild stocks.
- The contribution of juvenile migrants passing Lower Granite in August to adult returns may be significant and has not been evaluated.
- The FPC Annual Report for 2006, (www.fpc.org) includes a multi-year analysis of Snake River fall Chinook juvenile survival. Those analyses clearly indicate that spill and water travel time are primary factors affecting juvenile survival. Eliminating spill will

significantly decrease juvenile fall Chinook survival for fish migrating downstream during the no spill period.

References

NPCC (Northwest Power and Conservation Council) 2009. Columbia Basin Fish and Wildlife Program. Council Document 2009-2. http://www.nwcouncil.org/library/2009/2009-02.pdf

Petrosky,C.E. and H.A. Schaller. 2010 (in press).Influence of river conditions during seaward migration and ocean conditions on survival rates of Snake River Chinook salmon and steelhead. Ecology of Freshwater Fish (Accepted March 16, 2010).

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DATA REQUEST FORM

Request Taken By: Michele **Date:** 11-16-2010

Data Requested By:
Name: Ron Boyce **Phone:**
Address: Rick Kruger **Fax:**
ODFW **Email:**

Data Requested:
review materials presented to RIOG by NOAA and BPA provide comments - operations 2011 summer and spring

Before Dec. 3

Data Format: **Hardcopy** ☐ **Text** ☒ **Excel** ☐

Delivery: **Mail** ☐ **Email** ☐ **Fax** ☐ **Phone** ☐

Comments:

Data Compiled By: FPC staff **Date:** 11-30-2010

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DATA REQUEST FORM

Request Taken By: Michele **Date:** 11-19-2010

Data Requested By:
Name: Bob Heinith **Phone:** CRITFC
Address: **Fax:**
Email:

Data Requested:
review NOAA Biological information memo, and proposed operations for 2011

provide comments

Data Format: Hardcopy ☐ Text ☒ Excel ☐

Delivery: Mail ☐ Email ☐ Fax ☐ Phone ☐

Comments:

Data Compiled By: FPC staff **Date:** 11-30-2010

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