



FISH PASSAGE CENTER

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MEMORANDUM

TO: Tom Lorz, CRITFC
Fish Passage Advisory Committee

FROM: Michele DeHart

DATE: July 29, 2010

RE: Review of Acoustic Telemetry Evaluation of Juvenile Salmonid Passage at John Day Dam, 2009 Draft Final Report

In response to your request the FPC staff reviewed the subject draft report. Following are our comments for your consideration. The review and comment period for this draft closed on July 23, 2010. However, these comments may be useful to you in considering, design, analyses and appropriate management application of future acoustic tag evaluations of fish passage.

Our overall conclusion is that acoustic tag studies of this type do not provide a reliable basis for management decisions establishing spill levels for fish passage at individual hydroelectric projects. Juvenile acoustic tag data, such as was generated by this study, needs to be considered within a management decision framework that accounts for all of the available data and the specific limitations of each data set. An emerging body of scientific work indicates that there is the potential for delayed mortality occurring later in the life cycle, associated with juvenile route of passage. This study reports that survival was highest through the juvenile bypass route (JBS). However, a study conducted in the same year, Migratory Behavior and Survival of Juvenile Salmonids in the Lower Columbia River and Estuary in 2009, which used the same acoustic tagged fish, indicated that steelhead that passed through the JBS at John Day had lower survival in the estuary. In general the Comparative Survival Study results indicate that salmon and steelhead that pass through juvenile bypass systems have lower smolt-to-adult return rates than fish that pass through spill (Tuomikoski et al 2009). Petrosky and Schaller (2010) found that

smolt to adult survival rates are related to juvenile migration conditions as well as marine conditions.

- The conclusions of this report do not reflect all of the actual data collected during the study.
- The high JBS survival estimate appears inconsistent with the observations obtained from past radio-tag studies.
- Although the Biological Opinion performance standards were not met for any species at the project in 2009, the report concludes that lower spill levels with a wider spread should be tested (such as 10% versus 30%). However, given that performance standards were not met under the configuration tested, the data actually supports testing of higher spill levels at the John Day project, but the recommendations do not reflect this data.
- The 8 test block study design that was planned was not implemented at the project because of conditions. There is no discussion of the impact of not meeting the study design on study conclusions.
- The study showed that important passage characteristics such as forebay delay, decreased under the 40% spill test, but this was not emphasized in the conclusions, and the report concludes that there was no difference in the 40% and 30% spill tests, when looking at all seven blocks combined.
- The conclusion that there was a higher survival for yearling Chinook at the 30% spill level using only 5 of the seven blocks is difficult to assess. The 30% spill blocks were met throughout the seven block study period. However, the last two blocks were eliminated because the corresponding 40% spill level blocks were not achieved due to total dissolved gas management. In order to reach the conclusion that the 30% spill has a higher survival than the 40% spill, only 5 blocks were used. If all seven blocks are used there is no difference between the two spill levels. In block 6 and block 7 the survival estimates for the 30% spill actually decreased relative to the estimates for the first five blocks. For five blocks the survival estimate was 0.943, but decreased to 0.93 when all seven blocks were included.
- There is no way to determine the route specific survivals by spill treatment to compare the two conditions. It cannot be determined if this was due to limited tag numbers due to cost.
- There are no formal hypotheses presented in the in the study to be statistically tested, and yet two spill treatments were compared statistically. The report should address *a priori* hypotheses to be tested, or address the less formal approach adopted due to the decision to limit the number of tags to reduce cost.

Petrosky, C. and H. Schaller. 2010. Influence of river conditions during seaward migration and ocean conditions on survival rates of Snake River Chinook salmon and steelhead. Ecology of Freshwater Fish.

Tuomikoski, J., J. McCann, T. Berggren, H. Schaller, P. Wilson, S. Haeseker, C. Petrosky, E. Tinus, T. Dalton, and R. Ehlke. 2009. Comparative Survival Study (CSS) of PIT-tagged Spring/Summer Chinook and Summer Steelhead, 2009 Annual Report. BPA Contract # 19960200. <http://www.fpc.org/documents/CSS/2009%20CSS%20Annual%20Report-Final.pdf>