

State, Federal and Tribal Fishery Agencies Joint Technical Staff

*Columbia River Inter-tribal Fish Commission
Idaho Department of Fish and Game
Oregon Department of Fish and Wildlife
US Fish and Wildlife Service
Washington Department of Fish and Wildlife*

May 18, 2004

Rock Peters
Corps of Engineers
Portland District
PO Box 2946-PM-E
Portland, OR 97208-2946

Dear Mr. Peters:

RE: Review Comment SPE-04-NEW

The technical staffs of the state, tribal and federal salmon management agencies have reviewed the project entitled “Summer Spill Evaluation”, study code SPE-04-New, proposed by the US Geological Survey for funding through the US Army Corps of Engineers Columbia River Fishery Management Program. We had planned to provide these comments at an earlier date, but the considerable workload created by the response and analysis requirements of the Federal proposal to reduce summer spill for fish passage, was assigned priority. Our review conclusions and recommendations are followed by detailed discussion of our specific comments. **We do not support the implementation of this study.**

Conclusions and Recommendations

- The regional science group did not reach agreement on either the need for the project-by-project study nor was there regional scientific agreement that the agencies and tribes system-wide proposed study was not feasible. The agencies and tribes continue to support a system-wide, life-cycle approach.
- The problem statement is inaccurate and should be modified to represent the actual issues, which have precipitated this study proposal. The introductory paragraphs in the problem statement are intended to establish the context in which the study is proposed, describing the environment and management context for which the study is developed. It is important that the context be established accurately, in order to properly understand the intended management application of the study results. The intended application of results establishes study design criteria.

- The problem being addressed is a financial one, not a biological one. This should be clearly stated. The reason for the BIOP spill levels is due to the fact that spill is considered the safest passage route at Bonneville Dam. Bonneville Power Administration aggressively promoted the need for this study solely on the basis of their objective of reducing or eliminating cost of summer spill in hydropower production foregone.
- The agencies and tribes do not believe that the conduct of this study will provide a sufficient basis for modifying the Biological Opinion levels of summer spill for fish passage at Bonneville Dam or any other project. The Federal proposal to reduce summer spill for fish passage includes spill reductions or elimination at Ice Harbor, John Day, The Dalles, and Bonneville dams. The proposed study will not provide any information applicable to the impacts of decreasing spill at these other projects. The proposed study does not address the actual mechanisms of differences in spill passage survival. As has been observed at studies at The Dalles and Ice Harbor, project variables like specific spill bays, tailrace elevations, spill gate openings can affect spill passage and survival rates. The proposed study does not address these effects, nor does it address other potential covariates such as fish size, fish condition, environmental variables, origin and variable hydraulics within treatments.
- Delayed mortality impacts from specific passage routes will not be evaluated. This delayed mortality can be significantly different between passage routes. For example, Gilbreath et al. (1993) determined from estuary and adult recoveries that turbine and screen system passage at Bonneville Dam for subyearling chinook was three- to four-fold higher than spill passage. This is critical since smolt to adult return data indicates that indirect impacts of reduced spill result in “extra mortality”. Sequential passage through several bypasses could have cumulative indirect effects that are not apparent in direct survival studies.
- The importance of spill for fish passage cannot be determined without a thorough consideration and understanding of the system wide cumulative effects of hydrosystem operations and the cumulative success of mitigation measures in addressing those impacts. For example, the importance of spill at Bonneville Dam cannot be determined without an understanding of the efficacy of spill or transportation of smolts at upstream projects.
- There is no evaluation plan component to determine the impacts to adult salmon and Pacific lamprey under the proposed study design. Reduction of spill will force many stocks, both listed under the ESA and non-listed but nevertheless very important, to fulfill treaty-trust responsibilities, obligations under the *U.S.-Canada Salmon Treaty*, equitable treatment under the Northwest Power and Planning Conservation Act and obligations under the Fish and Wildlife Coordination Act. This is a key deficiency of the evaluation plan.
- The null hypothesis of the proposed study is inappropriate. The study is designed to show no statistically significant difference between spill conditions. Review of other radio tag study results, summarized as part of this proposal; indicate that this is the expected outcome. This study design and null hypothesis shifts the risk and the burden of proof to the fishery resource in favor of the more certain economic benefits to the hydrosystem. The null hypothesis should represent what we presently believe to be true, and should be H_0 : Survival at 50 Kcfs spill < Survival at 75 Kcfs spill. The alternative is therefore H_a : Survival at 50 Kcfs > or = Survival at 75 Kcfs. Reductions in spill should be assumed to be harmful unless proven otherwise. Utilizing power analysis to interpret statistical tests, as in this proposal, is inappropriate (Hoenig and Heisey 2002). The null hypothesis as proposed by the COE controls “harmful” errors by undefined Type II (beta) errors. The agencies and tribes preferred H_0 controls “harmful” errors by defined Type I (alpha) error.

Purpose of the Study

The proposal is purportedly a response to three issues: transportation of smolts results in few listed fish in the Lower Columbia, balloon tag studies at the Dalles indicated high predation rates on spillway passed fish, survival studies have not been conducted in August. The proposal states that the region has called for a study of summer spill for subyearling chinook because of these issues. However, the proposal incorrectly states that these issues have precipitated the demand for a summer spill study. The correct and appropriate management context for this study is that the Bonneville Power Administration has raised the demand for a summer spill study on the basis of their determination and analysis of the cost of summer spill relative to the number of listed fish impacted by reducing or eliminating summer spill. This potential management decision requires rigorous and precise analysis of the potential life-cycle consequences of spill reduction, and an evaluation plan capable of monitoring the full extent of the detrimental effects on a life-cycle basis.

Transportation

The effectiveness of the transportation of fall chinook is highly uncertain. Transportation may not be the optimal strategy for benefiting listed and non-listed fish. In-river migration with the provision of spillway passage may indeed be a better strategy for increasing life-cycle survival rates. Because of this transportation uncertainty, the assumption that few listed fish will be in the Lower Columbia cannot be used as a justification for spill reductions. Transportation of sub-yearling migrants at McNary and the Snake River projects can only be considered an interim program pending the outcome of on-going transportation studies. Preliminary review of incomplete life-cycle returns does not look promising for the continuation of the transportation program. Recent preliminary analyses of SAR data for transported and in-river migrating fall chinook raises serious questions regarding the efficacy of fall chinook transportation to recover stocks to ESA and tribal management goals (April 6, 2004 memo from the FPC to Lothrop and Tweit).

The Dalles Dam study August 2002 – Balloon Tag Studies

We believe that The Dalles Dam balloon tag study provides an insufficient basis for the conduct of this study. Results from balloon tag studies are highly suspect and do not provide a robust basis for any management decisions; neither do they provide a valid basis for need or conduct of this study. In fact the agencies and tribes have repeatedly voiced and documented their concern and objections regarding the use and appropriate application of data generated through balloon tag studies. The Dalles 2002 balloon tag study results, particularly for summer migrants are inconclusive and highly speculative.

Assumptions

Several assumptions underlying this study were listed in the proposal. Without verification of these assumptions, results from this study would be highly suspect. We question the validity of each of the four listed assumptions. Specifically, these assumptions included:

- 1) Spill treatments affect survival rates for fish <110 mm in the same way they affect rates for fish >110mm. In other words the sub-sampled population of fish >110 mm is representative of the entire population.** The assumption that fish greater than 110 mm survive at similar rate as smaller fish may not be true. First, these fish are likely to

behave very differently in terms of migration rates. Also, predation vulnerability may well be higher for smaller fish. This assumption is critical to the results of the proposed study. NOAA fisheries have hypothesized in their technical memorandum that fish size affects passage route and survival.

- 2) **The affects of spill treatments observed between ~20 June-20 July do not change in late July-August.** The assumption that survival during June and July is similar to August is also unlikely to be true. The study does not measure impacts of changes in operations at a time when proposed operations would occur. Given reduction in flows, increased river temperatures and reduction in water quality and consequently poorer fish condition, it is unlikely that June and July studies represent August fish. Impacts of turbine passage or bypass passage at warmer temperatures may be more severe during the hottest days of the year than would be measured by an earlier study. This fact acutely constrains the radio-tag study approach because in late July and August, river temperatures are too high to safely handle and tag fish. This assumption is critical to the results of the proposed study. Summer spill studies at The Dalles Dam showed a decline in survival in the later part of the migration. Stock composition and other factors change temporally as the migration season progresses. Further, studies by the Corps at Bonneville Dam indicate that juveniles change their vertical orientation in the water column during the summer, seeking lower depths later in the summer.
- 3) **The approach assumes that there are no treatment effects that occur outside the geographic bounds of the study (e.g. upstream releases and downstream detection sites).** There is no evidence basis presented for this assumption. The study design will attempt to measure direct effects of spill and compare those direct effects between two treatments. However, it is the impacts on adult return rates through the differential passage routes that should be considered the most important measures of hydrosystem effects. It is important that modifications to operations at projects be evaluated with respect to impacts on adult returns; that is, on a life-cycle basis rather than being based on direct survival estimates at individual projects.
- 4) **The approach assumes that project-specific survival rates can be assembled (modeled) to estimate system survival.** There is no empirical basis for this assumption, and none was presented by the authors of this proposal. Assembling project-specific survival rates to estimate system survival, in models such as SIMPASS, has been shown to be faulty, unreliable, and misleading for management decision-making. There are serious impacts of dam passage that are not expressed within the short-reach, survival estimates generated with the radio-telemetry methodology. The Snake River Comparative Survival Study results suggest that differential mortality is occurring in the estuary or ocean environment as a result of different routes of passage within the hydrosystem. Therefore, any study to determine the best operations at a project must account for delayed effects.

Additional Concerns

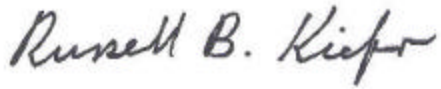
Biased results: The use of radio tags has become widespread. Research by Perry and Adams (2001) has shown, that these tags can affect swim performance and buoyancy. A thorough review of the impact of tagging on passage through the dams must be conducted to determine if these tags are comparable to PIT-tags. Small changes in radio-tagged fish behavior caused by the presence of the tags, could affect the proportions and survival rates of fish passing via various routes, and that could in turn, affect comparisons of the impacts of two different project operations as proposed. This would be important in a comparison such as that proposed at Bonneville Dam. This proposal does not cite any study demonstrating that radio-tags do not bias subyearling chinook behavior or survival. In fact the single study they do cite suggests that survival rates were affected by the use of radio-tags, and that the use of these tag types need further evaluation with subyearling chinook.

Detection of dead fish: The detection of dead fish at recapture locations can greatly affect study results. In some recent studies, there have been confounding affects caused by dead fish detections. This is an important problem with radio-telemetry studies.

Unequal treatment and composition of test and control groups: The study proposes to utilize different fish for treatment and control releases. Treatment and control fish should come from the same source and should receive exactly the same treatment including handling and transportation. Tailwater-released fish would be collected at Bonneville Dam, while forebay-released fish would be collected at John Day Dam. These groups could represent different populations of fish. For example, a large number of subyearling chinook enter the system from the Klickitat and Deschutes Rivers. In addition, the study proposes unequal handling of fish: tailwater-released fish captured at Bonneville Dam would not be transported to release location whereas upriver releases would be transported to The Dalles Dam tailrace. The variable composition and handling of test and control groups raise serious questions regarding the interpretation of study results.

Test spill level selected without adequate basis: The test uses 50 kcfs as a proposed minimum spill level. However, this level was never considered or tested for long-term implementation across all seasons or several years. The 50 kcfs was generated from one survival study done in 1989, with only one spillway, spillbay 5. It is unlikely that results from one test in one spill bay represent survival across the whole spillway at the 50 kcfs level. It is prudent to model spill patterns in the 50 kcfs spill volume range to generate the best possible operation for long term spill passage implementation

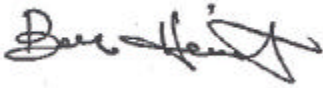
Sincerely,

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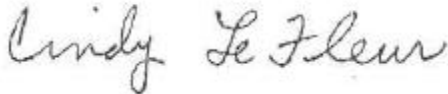
Russ Kiefer, IDFG

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Ron Boyce, ODFW

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Bob Heinith, CRITFC

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Cindy LeFleur, WDFW

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Dave Wills, USFWS