Independent Scientific Review Panel
for the Northwest Power & Conservation Council
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Memorandum (ISRP 2009-12) **April 17, 2009**

To: Tony Gover, Fish and Wildlife Division Director, Northwest Power and Conservation Council

From: Eric Loudenslager, ISRP Chair

Subject: Step-Two Review of the Chief Joseph Dam Hatchery Program, Project #2003-023-00

Background

On January 21, 2009, the ISRP requested[1] that the Colville Confederated Tribes provide additional information and analysis regarding four of six conditions required by the Council before completing Step Two of the Three-Step Review of the Chief Joseph Dam Hatchery Master Plan. These were technical issues raised by the ISRP in the 2005 Step-One review that remained unresolved after initial reviews of Step-Two submissions in March and November of 2008.

The Colville Tribes and consultants met with the ISRP on March 2, 2009 and presented their response to the comments made by the ISRP on the four unresolved conditions. The Colville Tribes provided a written explanation March 11, 2009. This memo serves as the ISRP's analysis of the Colville Tribe's response and our recommendation for project 2003-023-00.

The four unresolved issues were:

1. *A specific time-frame process (decision tree) that outlines the expected range of production scenarios;*

2. *Additional discussion of the master plan as it relates to alternative forms of mitigation;*

3. *Providing basic information regarding the in-basin and out-of-basin assumptions concerning (salmon) survival; and*

4. *Specifics on methods, designs (including controls), and hypotheses need to be incorporated in the monitoring plan.*

[1] ISRP 2009-2 Response Requested — Step Two Review of the Chief Joseph Dam Hatchery Program, Project # 2003-023-00 (www.nwcouncil.org/library/isrp/isrp2009-2.htm)

The issues raised by the ISRP in the Step-One review were intended to provide a sufficient understanding of the subbasin and program to evaluate its potential for success and consistency with the Council's program and best management practices. There were at least three specific themes. The first was whether the quantity and quality of the current environment in the Okanogan River (and Columbia River between Chief Joseph and Wells Dam) were sufficient to support increasing hatchery production beyond the Public Utility District supported releases from the Similkameen Ponds. Second, given the state of mainstem Columbia River, estuary, and ocean salmon survival and harvest, would the yield from the hatchery production provide a reasonable terminal fishery benefit for the Colville Tribes? Third, how would the additional hatchery production be managed to be consistent with conservation principles for maintaining the viability the natural population of summer Chinook salmon in the Okanogan River?

ISRP Recommendation

Meets Scientific Review Criteria

Review Summary

The Chief Joseph Dam Hatchery Master Plan has progressed significantly from the document originally submitted in 2005 and additional materials provided in Step Two in 2007. The Colville Tribes have made serious efforts to address the issues raised by the ISRP. More empirical data on the abundance and productivity of the existing natural salmon population and hatchery program have been provided. A decision framework was developed with the assistance of the All-H Hatchery Analyzer (AHA) model. Some consideration of alternative mitigation options was provided. And the outline for a monitoring plan continues to be refined. Simulation modeling via AHA has allowed examination of options and uncertainties resulting in significant positive adjustments to the plan while maintaining best practices of the Fish and Wildlife Program and the Hatchery Scientific Review Group (HSRG).

The ISRP emphasizes that while the master plan has incorporated best management practices into the decision framework, performed simulation modeling, and developed operating rules, there remains much uncertainty as to whether the salmon harvest and conservation goals can be reached. Careful implementation of the program, with adequate monitoring and evaluation, should provide the answer to that uncertainty. The March meeting and written response received by ISRP demonstrated that the Colville Tribes have the capability to address this monitoring and uncertainty. The model results indicate that there is a probability of achieving the fishery resources and harvest that were guaranteed over a century ago, if the assumptions are correct.

To the extent possible, the expansion of artificial production should follow demonstration of achieving the selective harvest objectives and conversion of the Similkameen Ponds production from its current state to a functioning integrated harvest program.

Brief comments from the ISRP on the Colville Tribe's response to the four unresolved issues are as follows:

1. ***A specific time-frame process (decision tree) that outlines the expected range of production scenarios*** **-** Joe Peone, Director of the Fish and Wildlife Department, Colville Confederated Tribes, provided a summary of the latest successful refinements in the Chief Joseph Dam Hatchery Master Plan relative to the ISRP's earlier comments and recommendations for hatchery reform, recently arising from the HSRG. As he stated, the recommendations to create a Biological Rule Set to clarify and refine hatchery-harvest program design and a Decision Tree to direct program implementation and adaptation have been major advancements not only for the proposed master plan but more broadly for Columbia River fishery management. We agree and appreciate the seriousness and thoroughness with which they addressed our comments and suggestions.

The decision framework establishes the numbers of adults collected and juveniles released as functions of the size of the natural population at Wells Dam and the ability to harvest adult hatchery. If the natural population falls below a threshold of 800 fish, there will be no artificial production. If required proportions of adult hatchery fish are not captured in the selective fisheries to achieve pre-set pHOS targets, hatchery production will be reduced. These are important criteria because standard monitoring for effects likely will not be adequate or sufficiently expedient to measure deleterious impacts on abundance and fitness of the natural population. This provides a risk-management approach to limiting unintended detrimental effects from the artificial production program. The function of this decision framework and a successful outcome is contingent upon selective harvest of >90% of the hatchery returns. An in-river weir is proposed, among other possible solutions, to address this need, and the ISRP strongly encourages that approach as the best solution. The ISRP also applauds as essential the Colville Tribes' recognition of the need to eliminate hatchery releases when natural origin returns are small, a decision consistent with sound principles of conservation science. On page 9 of the March 11, 2009 response, the Colville Tribes provide a series of phases beginning in 2009 and continuing through 2024, during which artificial production increases as goals of the program are reached. Central to this decision process is the selective harvest; the ISRP advises that an effective selective fishery should be demonstrated prior to hatchery construction.

2. Additional discussion of the CJHMP as it relates to alternative forms of mitigation **–** Three alternatives were briefly considered by the Colville Tribes: (1) habitat improvements only, (2) altered harvest management, and (3) a segregated hatchery program. The Tribes concluded that both habitat capacity and productivity would need to double to meet mitigation obligations by natural salmon production alone. They asserted that it is unlikely to achieve that by habitat improvement in a reasonable time period. Altered harvest management would require that all pre-terminal fisheries be eliminated, also an unlikely scenario. The ISRP accepts these as reasonable conclusions.

An open question is how the program might be reduced in size if substantial improvements in natural production are realized from habitat and hydrosystem improvements. A portion of this consideration is captured in sizing the program using the decision framework. Future reviews of the program should revisit this question.

3. Providing basic information regarding the in-basin and out-of-basin assumptions concerning (salmon) survival – On pages 15 through 19 of the March 11, 2009 response to the ISRP the Colville Tribes provide adequate detail on the in-basin and out-of-basin survival assumptions. Ecosystem Diagnosis and Treatment (EDT) modeling provided much of the summary of productivity and capacity for summer Chinook. This needs to be confirmed as part of the monitoring of the project. Stock/recruit analysis of the existing population and juvenile population estimates suggest that the goals of the project are possible.

Regardless, the key assumptions related to survival are sufficiently important to identify, measure rigorously, and report annually.

4. Specifics on methods, designs (including controls), and hypotheses need to be incorporated in the monitoring plan – The general data and derived metrics to be gathered for monitoring and evaluation appear sufficient for this program. The Colville Tribes identify 10 items that monitoring and evaluation will be conducted for (page 19), and 8 hypothesis (page 20) that will be tested as part of the Chief Joseph Hatchery Program. These elements cover the data the ISRP identified as needed for "primary management decisions" and the "primary and secondary biological attributes" (page 4 and 5 of our January 2009 review). The ISRP anticipates reviewing an explicitly detailed monitoring and evaluation plan in Step Three. In particular, we will be looking for a robust design, based on the selective harvest pilot studies now underway to address key programmatic assumptions on issues such as the efficiency of selective fishing, survival of retained broodstock and released adult fish, and related information needed to support and adaptively manage the project, as well as the critical inputs to simulation studies central to the decision framework and analytical tools. Developing the field protocols to estimate important salmon abundance and survival rates with sufficient precision is necessary to the use of the decision framework to adaptively manage the program. The ISRP recommends that the initiation of proposed hatchery production must be conditional not only on explicit refinement of the monitoring and evaluation plan but also on its rigorous implementation.

Columbia River basin scientists, organized as the Ad Hoc Supplementation Workgroup (AHSWG), produced recommendations for monitoring supplementation projects, including analysis models using reference locations. The ISRP encourages the Colville Tribes to become involved in the evaluation of hatchery programs at the basin level. Programs from regions such as the Okanogan can make important contributions to our understanding of the potential benefits and limits of using artificial production to mitigate for various anthropogenic alterations of the aquatic ecosystem. Indeed, with the addition of the in-river weir, the Okanogan project may become critical to the monitoring of supplementation effectiveness overall.

One of the points raised by the ISRP in this and other reviews is the need for reference locations for monitoring and evaluation. The Colville Tribes state that there is no adequate reference stream in the Okanogan River, concluding that candidate streams in the Wenatchee and Methow are substantially different and would be inappropriate. They further argue that identification of reference streams should be treated as a regional issue. The ISRP concur with the latter view and believe the former (inappropriateness of streams in the Wenatchee and Methow) may be an overly restrictive interpretation of the requirements of a reference location. The AHSWG report

developed a range of strategies to provide reference sources to evaluate artificial production efforts. Consequently, the Colville Tribes should revisit the topic of evaluation using reference designs and consider the ongoing regional efforts (e.g., AHSWG) in Step Three.

Finally, in the Step One master plan and Step-Two materials, the Tribes identified that the independent population status of the Okanogan River and Columbia River (between Wells and Chief Joseph dams) summer Chinook was in question and under investigation. The monitoring and evaluation plan, and other Step-Three materials should clarify the status of these inquires and identify any monitoring and evaluation needed to assess the effects of the Okanogan and Chief Joseph artificial production on local genetic diversity as this program unfolds.