Northwest Power and Conservation Council

January 13, 2011

Mr. William C. Maslen
Manager, Fish and Wildlife Division
Bonneville Power Administration
P.O. Box 3621
Portland, Oregon 97208

Dear Mr. Maslen:

The purpose of this letter is to advise you of the Council's decision on a Columbia River Fish Accord proposal. This recommendation was made by the Council at its meeting on January 12, 2011.

In addition, a purpose of this letter is to inform the project sponsor and other interested parties of the status of this Council action. The following is a summary of the action taken by the Council at the meeting in January.

***Influence of Environment and Landscape on Salmonid Genetics,* Project #2009-005-00**
On November 4, 2008, the Council received from Bonneville a set of 11 Columbia Basin Fish Accords proposals. Included in this set was a proposal from the Columbia River Intertribal Fish Commission (CRITFC) for Project #2009-005-00, *Influence of Environment and Landscape on Salmonid Genetics*. The proposal was submitted to the ISRP for review, and on December, 12, 2008 the ISRP provided a review (ISRP document 2008-15). The ISRP members requested additional information before they could determine if the proposal met scientific criteria.

The project has two objectives. The first is to determine the effects of watershed/landscape characteristics (e.g., elevations and barriers) to the genetic structure of Chinook and steelhead populations, and the second is to evaluate how environmental conditions influence the phenotypic and genetic expression of traits (e.g., smoltification, thermal tolerance, and disease resistance) as they relate to the recovery of salmonid populations. The project has the potential to contribute to the understanding of how and why life-history adaptive variations of Chinook salmon and steelhead/resident rainbow trout populations are distributed as they are in the Columbia River Basin. This information is expected to influence the designation of ESUs in the Columbia River Basin and could provide information that would be helpful to the recovery of listed species, including natural and supplemented populations. For example, this project could identify stocks or individual fish with high potential for anadromy that could be used to increase steelhead abundance in specific drainages.

In their December, 12, 2008 review (ISRP document 2008-15), the ISRP members requested additional information before they could determine if the proposal met scientific criteria.

On January 28, 2009 the ISRP and the Council received a response from the CRITFC, and on February 19, 2009 the Council received the final review from the ISRP (ISRP document 2009-3). The ISRP found that the proposal "Does Not Meet Scientific Review Criteria" because it lacked adequate detail to meet certain review standards.

The ISRP found that the proposed project did not meet review criteria, but appreciated the sponsor's effort and the information provided to date. In both the preliminary and final review provided by the ISRP, it was noted that the proposal is large and complex. The ISRP found that the proposed project needs additional detail to meet review criteria and recommended that the sponsor provide a study design with the clarity and detail needed for such a progressive and innovative research study.

Based on the need to gather additional details, the Council recommended on March 11, 2009 that the project sponsor continue to design the project for implementation. This recommendation was conditioned on the understanding that the structure and detail associated with the implementation of the project is dependent on a review by the ISRP and Council.

On May 11, 2010 the Council received a submittal intended to address the conditions placed on the project by the Council action on March 11, 2010. The submittal included a cover letter and a revised narrative.

On June 18, 2010 the ISRP provided its follow-up review, which found that the revised narrative was an improvement but that additional detail was needed before a technical review could occur. The ISRP found the submittal did not meet scientific review criteria (ISRP document 2010-21). The ISRP requested a point-by-point response to the items raised in its previous review and requested consideration of further development of the investigation supported by a relevant literature review.

On September 7, 2010 the ISRP had a teleconference with the CRITFC. The teleconference included a PowerPoint presentation. Based on this interaction the CRITFC provided a response report on September 23, 2010 to the Council intended to provide the detail requested by the ISRP.

On November 12, 2010 the ISRP provided its second follow-up review (ISRP document 2010-36) that found the project meeting scientific review criteria (qualified). The ISRP does not expect a response to these qualifications.

Though the ISRP found the project met review criteria, the members expressed concerns about the application of the project (qualification #1) to the region and that in future reviews CRITFC take into account the suggestions offered as part of this most recent review (qualification #2). These suggestions are intended to benefit the project and the use of identifying adaptations of salmon and steelhead to the Columbia River environment and possible selection to improve fitness as a possible recovery action (e.g., focus on biogeographic sampling of steelhead, population selection, and detail associated with laboratory experiments).

On December 14th Council staff presented these findings to the Fish and Wildlife Committee. During this discussion further detail was requested regarding the expenditures to date associated with this project and the nature of the scientific review qualification.

The ISRP determined the project met scientific review criteria with one qualification regarding how new knowledge emerging from this project will be used for implementation in the long run for the recovery of salmonid populations.

This concern regarding future management applications is a shared by Council staff, but the project sponsors, many salmon managers and the ISRP recognize the benefits of this project could be substantial. Neither Council staff nor the project sponsor believes it is possible to fully understand the management applications of this research effort at this time. The main intent of this study is to better understand the genes that matter to fish in the field in order to make more informed recovery, conservation, and management decisions. Some primary areas for possible application include the following.

- Improved resolution of ESUs based on functional genes and adaptive potential of populations throughout the Columbia Basin,
- Evaluating genomewide effects of domestication selection
- Selection of stocks that are most appropriate for recovery and reintroduction purposes

Recent advances in both spatial and genetic analysis methods have provided an opportunity to better understand the relationship between fish populations and their environment. Exactly how the information that is learned will be applied to management decisions depends upon the nature of the interactions that will be discovered. The ISRP's qualification states the region should be made aware that this type of information may at some point in the near future be available for managers, and therefore implementation protocols will need to be developed. This was captured in the ISRP final review of the project (ISRP document 2010-36) as follows.

> *In summary, the benefits from elucidation of the adaptively relevant genetic structure of both natural and hatchery stocks of both species should be substantial. ... While we are still learning how to pose and answer the appropriate questions, the problem that motivates this proposal is clearly important. It is equally clear that the challenge, even with the modern molecular, statistical and GIS technology at our disposal, remains large. We will have to triangulate the answers from the field, lab, and experimental work to obtain managerially powerful guidance.*

The sponsors believe information gained from this project will not only contribute to better understanding of the adaptation of fish to their environment, but have also explicitly linked this project to related projects[1] that may assist in developing sustainable restoration strategies in the face of the ever-changing environment in the Columbia River Basin (e.g., climate change).

[1] Project #2008-907-00, *Genetic Assessment of Columbia River Stock.* As approved by the Council on January 15, 2009 - The objectives of this project are to address needs for distinguishing specific stocks, determine genetic diversity, stock-specific run timing, and estimate stock composition for improved fisheries management and harvest. Through the analysis and evaluation of the single nucleotide polymorphism (SNP) markers the sponsor hopes to expand existing baselines for genetic stock identification (GSI) of salmon and steelhead in the Columbia River Basin.

Based on the ISRP reviews of this project the Council supports this project for implementation.

Sincerely,

Tony Grover
Director, Fish and Wildlife Division

cc: Christine Read, BPA
Jamae Hilliard Creecy, BPA
Peter Lofy, BPA
Ben Dick, BPA
Paul Krueger, BPA
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Project 2009-008-00, *Climate Change Impacts.* Currently in planning mode to coordinate, develop and complete preliminary work with other climate-change modeling efforts in the region. This will help better develop the scope of the project in relationship to other ongoing efforts while gathering existing data for baseline modeling. The expectation is that a proposal will be submitted to the ISRP within the next year.
Project #2009-009-00, *Basinwide Supplementation Evaluation*. As approved by the Council on June 9, 2009, the goal of this project is to support recommendations from the Ad Hoc Supplementation Workgroup (AHSWG 2008) for a basinwide evaluation of the long-term effects of hatchery supplementation on productivity of naturally spawning anadromous salmonid populations. To address this recommendation there is a need for more accurate and precise information on trends in abundance and productivity of supplemented salmon and steelhead populations and relative reproductive success (RRS) of naturally spawning salmon of natural origin versus hatchery origin within supplemented populations.