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January 7, 2009

DECISION MEMORANDUM

TO: Council Members

FROM: Mark Fritsch, project implementation manager

SUBJECT: Council decision on the Columbia River Fish Accord review for Genetic Assessment of Columbia River Stocks, Project #2008-907-00

PROPOSED ACTION: The Council staff has provided two alternatives for the Council members to consider.

BUDGETARY/ECONOMIC IMPACTS

The total amount associated with this accord project equals \$9,420,886 (e.g., approximately \$860,000 to \$1,047,825 per year¹) in expense funds for Fiscal Year 2008 through 2017.

BACKGROUND

In May 2008, Bonneville, US Army Corps of Engineers, and US Bureau of Reclamation signed agreements with the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), the Confederated Tribes of the Warm Springs Reservation (CTWSRO), the Confederated Tribes and Bands of the Yakama Nation (YN), the Columbia River Inter-Tribal Fish Commission (CRITFC), Confederated Tribes of the Colville Reservation, and the states of Idaho and Montana to implement a set of projects and actions that will deliver specific, scientifically sound results for the region's fish and wildlife.

As with all projects in the Fish and Wildlife Program, the accord projects were subject to scientific review by the ISRP. As outlined in the guidance document associated with the review process for the Accords, the Council recognizes Bonneville commitments to the projects under the Accords. However, the Accords do not alter the Council's responsibilities with respect to ISRP review or the Council's role following ISRP review. Consequently, the Council will provide its recommendation on each project based on full consideration of the ISRP report and the Council's program.

¹ Includes the anticipated 2.5% annual inflation adjustment, beginning in FY 2010.

On November 4, 2008, the Council received from Bonneville a set of 11 Columbia River Fish Accord proposals. The submittal received reflects proposals from CTWSRO, YN and CRITFC.

On December, 12, 2008 the ISRP provided a review (ISRP document 2008-15) of the 11 proposals and found that only one of the proposals meets the ISRP's scientific review criteria (i.e., "provides adequate scientific justification for the proposed activity"). The remaining ten proposals needed additional information before the ISRP could determine if they meet scientific criteria (please see Attachment 1).

The review received from the ISRP provides a preliminary review for all but one of the proposals. The one proposal found to meet scientific review criteria is a final review recommendation for the *Genetic Assessment of Columbia River Stocks*, Project #2008-907-00. The remaining ten proposals are being requested to provide additional information before the ISRP can provide a final determination on whether they meet scientific criteria².

The *Genetic Assessment of Columbia River Stocks*, Project #2008-907-00 submitted by the CRITFC is a compellation of the following four accord proposal from the May 2008 agreement. These proposals are new and are categories as not benefitting an ESA action in support of the FCRSP BiOp implementation³.

- Proposal #2008-501-00, *GSI (Genetic Stock Identification) to Evaluate catch*, Attachment B, New, Category 2c
- Proposal #2008-510-00, *SNP (Single Nucleotide Polymorphism) Discovery*, Attachment B, New, Category 3
- Proposal #2008-511-00, *Bonneville GSI*, Attachment B, New, Category 3
- Proposal #2008-520-00, *Genetic baseline expansion*, Attachment B, New, Category 3

The proposals were inter-dependant upon each other⁴, and were therefore combined by agreement by the sponsor and Bonneville for the review submittal. The objectives of this project is to address needs for distinguishing specific stocks, determining genetic diversity, stock specific run timing, and estimating 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.

ANALYSIS

The ISRP found that the project meets review criteria and stated that it was well written and justified. The ISRP did provide some recommendations to the sponsor regarding design details and communication of the data collected. The ISRP felt that the project addresses needs of the Council's Fish and Wildlife Program because many management, mitigation, and conservation decisions regarding Columbia River Basin salmon are driven by the spatial, temporal, and life-history structure of salmon diversity.

² On December 15, 2008 the ISRP sent requests to the sponsors for additional information.

³ Category 2c and Category 3 - Actions benefitting other fish and wildlife species addressed under the Northwest Power Act and additional RME actions.

⁴ SNP markers are needed to complete species specific baselines, and these baselines are requisite to complete GSI.

ALTERNATIVES

1. Implementation of the Proposal

As proposed and reviewed the Council could opt to recommend the proposal for implementation. The proposal met the expectation of science review and the recommendations provided by the ISRP for the project can be addressed through contracting. The Council expects that the project proponent will participate in development of a regional approach to monitoring, evaluation, research and reporting (MERR) strategies. Changes to scope and intent of this project may be required when the regional MERR strategy is in place.

2. Defer Decision

Though the study could contribute to the management of salmonid fish stocks by improving stock composition accuracy and may allow stock composition and assessment needs for timely management of fisheries it is also a very costly initiative. The proposal is also being received at a time when the Council is active in developing a regional approach to monitoring, evaluation, research and reporting (MERR) strategies in the basin.

Currently, the intent of the Council's anticipated regional framework to accomplish an effective and supported strategy to move towards a more coordinated approach than an individual project based approach to monitoring and evaluation currently exists. Through the development of the MERR strategies the Council needs to both define and measure the success of its Fish and Wildlife Program. In addition the Council needs to determine how much monitoring, evaluation and research is needed in light of budget constraints⁵, which will have changes to current project expectations and requirements for individual projects and the portfolio of projects currently in this category.

Based on this understanding the Council should proceed cautiously with a recommendation regarding the full implementation of this proposal until a more complete understanding regarding the MERR is defined and how this particular proposal would fit within this framework. Therefore, the Council could defer a decision regarding implementation of this project until the region has an effective, accepted, and supported MERR framework.

⁵ The total amount associated with this accord project will approximate one million dollars per fiscal year through 2017.

Attachment 1: ISRP review of the first set of 11 Columbia River Fish Accord Proposals, submitted on November 4, 2008.



Independent Scientific Review Panel

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Memorandum (ISRP 2008-15)

December 12, 2008

To: W. Bill Booth, Council Chair

From: Eric Loudenslager, ISRP Chair

Subject: ISRP General Comments on the First Set of 11 Columbia River Fish Accord Proposals, Submitted November 4, 2008, and Final Review of the Proposal “Genetic Assessment of Columbia River Stocks” (project #200890700)

Summary

On November 4, 2008, the Council and the Bonneville Power Administration asked the ISRP to review a set of 11 Columbia River Fish Accord proposals.⁶ The ISRP has conducted a preliminary review of the proposals and found that only one of the proposals meets the ISRP’s scientific review criteria (i.e., “provides adequate scientific justification for the proposed activity”); see our review attached below. The other ten proposals need additional information before we can determine whether they meet scientific criteria.

To expedite implementation of Accord proposals, the ISRP will release final recommendations on proposals as soon as sufficient information is provided for us to complete our scientific evaluation. To further this effort, we will directly request information from the project sponsors of proposals that lack sufficient specificity. For the current set of proposals, by December 16, we plan to contact and request additional information from the project sponsors of the ten proposals that need more detail. A few project sponsors will likely be able to respond to our comments quickly in a response memo, but most proposals need significant revision.

Background

In 2008, the Bonneville Power Administration (BPA), US Army Corps of Engineers, and US Bureau of Reclamation (collectively, the “federal action agencies”) signed agreements with the Confederated Tribes of the Umatilla Indian Reservation (CTUIR), the Confederated Tribes of the

⁶ www.nwcouncil.org/fw/projectselection/accord/Default.asp.

Warm Springs Reservation (CTWSRO), the Confederated Tribes and Bands of the Yakama Nation (YN), the Columbia River Inter-Tribal Fish Commission (CRITFC), Confederated Tribes of the Colville Reservation, the Shoshone-Bannock Tribe and the states of Idaho and Montana to implement a set of projects and actions that will deliver specific, scientifically sound results for the region's fish and wildlife.

Accord projects have established budgets and have been determined by BPA to satisfy in lieu requirements and other consistency issues. These projects are not competing with other projects for funding. However, these Accord projects are subject to ISRP review using the ISRP's standard and statutorily defined criteria. In reviewing Accord projects, the ISRP will continue to focus on scientific criteria, project improvement, and scientific accountability.

Existing projects with no change in scope that are now listed in the Accords will be reviewed by the ISRP with other Fish and Wildlife Program projects in the categorical and geographic reviews. Newly proposed work, such as the 11 proposals considered for this memo, will be reviewed when submitted to allow the projects to proceed as quickly as possible. Where appropriate, Accord projects will be reviewed within the categorical or geographic reviews to maintain consistency and work load efficiency.

General Impressions on the First 11 Accord Proposals

The ISRP appreciates the willingness of the project sponsors to be the first to submit Accord proposals. We hope our general comments and specific feedback on the individual proposals are used to guide submittal of subsequent Accord proposals.

The ISRP's general comments include:

- The overall quality of the proposals is not as good as the FY 2007-09 proposals. The ISRP's report *Preliminary FY 2007-09 Review, Programmatic Comments*⁷ (ISRP 2006-4a, pages 12-13) includes examples of proposals that have good coverage of certain proposal elements. In addition, all of the proposing agencies have submitted numerous past proposals that have passed ISRP scientific review, and the sponsors can use them as examples.
- Many of the proposals contain information sufficient only as a pre-proposal. The general strategy might be justified, but much more documentation and detail are needed for the proposal to be reviewed on its scientific merits. For these proposals more is needed than a brief clarification of a few points; consequently, the ISRP found few issues that could be addressed with a quick call or e-mail to the project sponsors. Some proposals need to be completely re-worked to meet the criteria for scientific adequacy.
- The absence of the administrative form hindered our review. Without a budget, reviewers lacked valuable information on the sequence and duration of project implementation, which gives an indication of the logical progression of the project and the ability of the sponsor to complete the project. The ISRP recommends that future submitted Accord projects include a

⁷ www.nwcouncil.org/library/isrp/isrp2006-4a.pdf

budget linked to work elements and a timeline.

- Some projects significantly overlap, geographically and topically. These need to be combined into one proposal, or, if they are kept separate, specific coordination mechanisms need to be described in the project relationships section of the proposals. For example, see the Warm Springs steelhead and spring Chinook production monitoring proposals (200831100a & 200831100b).

The ISRP is committed to working with the Council, Bonneville, and project sponsors to ensure the proposals are technically sound, thoroughly justified, well documented from their initiation, and improved through our review. We look forward to responses to our requests for further documentation and to future proposals. Our final review of the proposal *Genetic Assessment of Columbia River Stocks* (project #200890700), which we found to be scientifically adequate, follows below.

200890700 - Genetic Assessment of Columbia River Stocks

Proposer	Columbia River Inter-Tribal Fish Commission
Short Description	Genetic Assessment of Columbia River Stocks
Province(s)	Basinwide
Subbasin(s)	Basinwide

<http://pisces.bpa.gov/release/documents/DocumentViewer.aspx?doc=P108875&session=500441b3-1761-42d2-9431-9802c91e5095>

ISRP Recommendation: *Meets Scientific Review Criteria*

This is a very well-written and well-justified proposal that meets scientific criteria, though some minor design and method details are absent. The publication track record and overall participation in communication of results from this Principal Investigator and team is very commendable and bodes well for the project being able to achieve its stated objectives and reach a wide audience in the basin.

The ISRP recommends to the sponsor:

- Formal and informal communication of results and analyses – in spite of the Principal Investigator’s track record, communication of the data (and standardization) with other labs/programs in the Columbia River Basin should be planned and articulated.
- Expansion on design details to include number and location of sampling sites, as well as intensity of sampling within a site for sufficient analytical power.
- Control/reference approach for calibrating and verifying GSI estimates for runs passing Bonneville Dam.

ISRP Comments

1. Technical Justification, Program Significance and Consistency, and Project Relationships (Sections B-D)

This project aims to identify and expand available suites of molecular markers (especially SNPs) for the purposes of establishing population-level baselines for Chinook and steelhead (with initial exploration of sockeye and coho as well). Moreover, the baseline data can then be employed for a number of uses, including Genetic Stock Identification (GSI) of tribal and non-tribal harvests or fish passing through the power system (especially at Bonneville Dam).

The project sponsors have made a good case for transitioning to SNP technology, including ease of standardization, cost-effectiveness, and the ability to sample carcasses. SNPs are markers inherited in known and stable patterns making them useful for population/stock delineation. An ongoing review of tagging approaches and technologies by the ISAB and ISRP suggests that SNPs and associated computational improvements will likely become a standard in the future. They are widely distributed throughout the genome and should provide a bountiful source of

variation once catalogued and standardized among users. While there will be a short term “cost” associated with transitioning to SNPs on top of microsatellite markers, in the longer term the investments should help with improved population/stock delineation capability as well as feed into parentage analyses and other marker-assisted monitoring. Most importantly, the project does not simply focus on the molecular laboratory component, but also has an equally important focus on the computational side of the analyses – specifically, how variation “behaves” in populations and how much statistical power the markers afford for addressing key questions.

This project is sufficiently detailed overall and appears to be technically justified because the ability to distinguish between divergent stocks of Columbia River Basin salmon and steelhead along with the ability to characterize their genetic diversity has become an important element involved in an “All H” approach to recovery – hydroelectric operations (e.g., determining the timing of flow manipulation at dams to benefit target runs), hatcheries (determining when and where to use artificial production to minimize impacts on wild stocks or to rebuild naturally-spawning populations), harvest (identifying harvestable stocks and distinguishing them from at-risk stocks), and even habitat (determining the origin of fish utilizing restored habitats). As such, the proposal is linked also to specific action needs in the BiOp and to recommendations by the ISAB and the Council’s Fish and Wildlife Program.

While the sponsors present how this effort would be well integrated into other genetic stock identification projects in the Columbia Basin, the ISRP recommends to the sponsors that it will be critical to maintain communication of the data (and standardization) with other labs/programs in the Columbia River Basin and coast-wide. Additionally, the project would take advantage of existing adult monitoring efforts (PIT Tag sampling program) to obtain tissue samples for genetic analysis minimizing the need for special, stand-alone sampling of populations. Another issue that will be vital for the sponsor relates to the last paragraph in Section B under *Genetic Stock ID*, where the sponsors plan to sample unknown origin salmon and steelhead at Bonneville Dam to determine run composition. The ISRP recommends that the sponsor will want to more clearly articulate how the sampling would be applied to different life-history types, or more to the point, how those different life-history types within (and among) populations would be first identified, and then verified. Here, an independent assessment (and “control”) of the accuracy of the SNP-based GSI would be very desirable to amplify confidence in this application of a new marker and model approach. While there may be several approaches to accomplish this goal, perhaps this might be accomplished by physically tagged (PIT or CWT) fish.

2. Objectives, Work Elements, and Methods (Section F)

The project objectives and work elements are relatively clear and straight-forward. The ISRP commends the sponsor for including computational and statistical considerations upfront to ensure adequate analytical “power” and inform project design rather than as an afterthought.

There were some details within the methods description – such as the number and location of population samples, the sample sizes for SNP analysis, and how the stratified design would lead to a valid sampling scheme for steelhead and Chinook – that the ISRP recommends be included as part of the revised program description.

3. M&E (Sections G, and F)

This project is primarily an exploratory and baseline research project, rather than a specific management or conservation action. As such, the information will be useful for future M&E activities in the basin that require or benefit from stock delineation/identification (e.g., parentage analysis of returning recruits, composition of mixed stock harvests, recruitment of wild production, and so on). Overall, procedures for this project appeared to be well thought out, although the basis for the sample sizes was not always presented. Nevertheless, the methods, analyses, and data archiving techniques were appropriate for this level of proposal. We note that the stratified sampling plan for fisheries (Work Elements 189 and 156) has yet to be developed – and will depend on the structure of diversity uncovered in the baseline samples.

4. Overall Comments - Benefit to F&W (all proposal)

This proposal is well-justified and will address a number of identified needs in both the BiOp and Council's Fish and Wildlife Program because many management, mitigation, and conservation decisions regarding Columbia River Basin salmon are driven by the spatial, temporal, and life-history structure of salmon diversity.