Independent Scientific Review Panel
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Memorandum (ISRP 2008-3) **April 11, 2008**

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

From: Eric Loudenslager, ISRP Chair

Subject: Review of Updated Study Plans for the Rufus Woods Supplementation and Creel Project (2007-405-00)

Background

This is the ISRP's third review associated with the Confederated Tribes of the Colville Reservation's *Rufus Woods Supplementation and Creel Project* (2007-405-00). The Colville Tribe proposes to stock triploid rainbow trout into Lake Rufus Woods to provide increased tribal subsistence and tribal and non-tribal recreational harvest. In addition, they propose to evaluate stocking success with creel data collection.

The original proposal was submitted to the Budget Oversight Group in April 2007. The request was then presented to the Council at their August meeting, and they approved sending the proposal to the ISRP for review. The ISRP reviewed the proposal, asked for a response, reviewed that response, and issued a final review (ISRP 2007-17[1]). In that review, the ISRP noted that the proposal gave an excellent overview of the tasks, description of products, and timing for each of the work elements. However, the ISRP found that the proposal and response did not provide sufficient information on creel sampling, stable isotope analysis, and trout diet analysis to judge whether these elements of the project will fulfill their objectives. This led to a project ranking of *Meets Scientific Criteria (Qualified)* and another request for study detail.

On March 18, 2008, the Colville Tribe submitted a response to the ISRP's request for additional information about the study designs. The response materials consisted of a cover letter, a three-page document summarizing the procedures to be used to determine rainbow trout origin and diet preferences, a creel census study plan prepared by Dr. John Skalski of the University of Washington, and finally a manuscript describing the use of stable isotopes to describe trophic partitioning in trout in Twin Lakes, Washington. The latter document was intended to demonstrate that isotopic techniques could be used to ascertain fish of different origin in Lake Rufus Woods.

[1] www.nwcouncil.org/library/isrp/isrp2007-17.htm

In this memo, the ISRP comments on the materials submitted by the project sponsor with regard to whether the information has satisfied our request for greater study details, and assesses whether the project is fully justified scientifically.

ISRP Recommendation and Summary

Meets Scientific Review Criteria (In Part)

The ISRP finds that sufficient information has been presented to justify the Lake Rufus Woods creel survey and the stocking of 24,000 feminized triploid rainbow trout. But the stable isotope and diet analysis components of the project have not been adequately justified. The creel plan is the centerpiece of the monitoring needed for the fish stocking, while the stable isotope and diet analysis components are not critical to have in place before stocking the fish.

Specific Comments

Creel Survey Design

The creel survey framework developed for Lake Rufus Woods by Dr. Skalski is the first step in executing this important effort to learn about angling pressure, catch rates, total catch, and the contribution of net-pen reared triploid rainbow trout released specifically for angler harvest. There will be a need to further specify the exact days that each of the strata are sampled, ensure that 1) the surveys are actually conducted, 2) the survey is conducted according to the plan, and 3) data is tabulated and archived correctly. These quality control, quality assurance efforts are not developed in the current sample framework. If this proposal is approved and funded additional effort should be provided to finish developing a detailed and executable creel survey protocol. Finally, the data should be reviewed and analyzed by statisticians once available to ensure that the data is suitable.

Stable Isotope Analysis

In response to our concern about the lack of specifics in the original proposal regarding the planned stable isotope study, a copy of a manuscript describing some stable isotope work conducted in Twin Lakes was provided. The Twin Lakes work was intended to determine the diets of several fish species, including golden shiner, largemouth bass, and rainbow trout. In this application the method worked quite well, indicating, among other things, that larger size classes of bass were consuming stocked brook trout. However, the proposed application of stable isotope analysis to the Rufus Woods fish origin question is much different, in which stable isotopes will be used to differentiate among various stocks of rainbow trout in Rufus Woods Lake using isotope signatures. The ISRP's original concerns about the feasibility of this approach still apply. It may be possible to differentiate fish that have been utilizing natural food sources from those that have recently been released from net pens or hatcheries using stable isotope techniques, although we are not aware that this has been done. But how long will this distinction last? And are the isotopic signatures of the food sources the five stocks are using

sufficiently different to enable clear separation? These are key questions that were not addressed in the response.

The response did not include any new information on how the stable isotope study would be conducted, other than indicating that tissue samples would be collected in conjunction with the creel surveys. How will samples of potential food sources be sampled? How many samples of this type will be analyzed? How will the data be analyzed? A project proposal that describes this component of the study should have been included with the response materials.

The ISRP believes the use of stable isotopes may be useful in determining trout origin, at least in differentiating naturally produced fish from those that were released from net pens in Rufus Woods Lake or Lake Roosevelt. However, finer levels of distinction may be difficult. A pilot study that analyzes a relatively small number of tissue samples from fish of known origin and characterization of the stable isotope values of potential food sources would be a relatively inexpensive way to judge the likely value of this approach. The manuscript describing the research at Twin Lakes was interesting but not entirely applicable to Rufus Woods because it focused on trophic partitioning and did not include an examination of trout of multiple origins. For this reason we do not feel the stable isotope project element meets scientific criteria until a proof-of-concept pilot study demonstrates that the technique can actually help differentiate between the five potential origins of rainbow trout in Lake Rufus Woods, or if sponsors can cite studies done elsewhere that have conclusively done so.

With regard to the overall question of the contribution of triploid rainbow trout to the sport and subsistence fisheries, we agree that marking fish deliberately released from either the net pens or the tribal hatchery using Floy or elastomer tags, or adipose clipping, will assist in resolving some of the uncertainty surrounding the origin of trout taken in the reservoir. Given the multiple potential sources of the fish, and the unreliability of morphological examination (fin erosion or tissue pigmentation) as time since release increases, there is always likely to be uncertainty. However, tag recoveries will certainly demonstrate that net pen or hatchery fish constitute an important component of the catch, and for this reason we fully support the tagging effort.

Diet Analysis

In our previous review of this project, we had this comment about the importance of understanding the food habits of rainbow trout in Lake Rufus Woods:

More details were also needed for the diet analysis component of the creel survey. In particular, it will be helpful to verify that triploid rainbows stocked in Rufus Woods do not, as preliminary evidence suggests, become piscivorous. It may be that the trout remain generalized macroinvertebrate and plankton feeders as they grow, similar to the pen-reared rainbow trout stocked in Flaming Gorge reservoir, Utah (Haddix and Budy 2005). However, the largest trophy trout (including lake trout) in Flaming Gorge feed on other fish. Because the target harvest size in Rufus Woods is five pounds or greater, and because rainbows from the reservoir have exceeded 20 pounds, the potential for piscivory by very large individuals exists and should be monitored. With the annual recruitment into Rufus Woods of several hundred thousand fish from downstream entrainment at Grand Coulee dam, an ample forage base of small fishes such

as juvenile kokanee must exist in the reservoir. Studying the dietary habitats of the stocked rainbows will be a key to understanding why the Rufus Wood trout attain such large size, and if this growth can be sustained at much greater stocking rates. The ISRP also feels that if dietary analysis shows an important food item to be an at-risk species, then heavy stocking should not proceed without an appropriate analysis of the effects of piscivory or competition on the at-risk species.

The project sponsors provided a brief response to the ISRP's request for more information about diet analysis. They stated that 100 stomach samples would be taken every quarter from randomly selected fish returned by anglers to boat ramps at both ends of the reservoir. Trout length and weight would be recorded for each sample, and stomach contents would be analyzed by Colville Tribal biologists.

We feel that insufficient details were presented to determine whether this project element will help answer the original ISRP questions: What do the rainbow trout in Rufus Woods consume to attain such large size, and is there any risk that increasing the density of large-bodied trout by stocking might result in unacceptable predation on at-risk species? The sample size of 400 trout stomachs annually seems adequate, but there is no assurance that random samples of trout at exit boat ramps will reflect the true distribution of trout sizes in the reservoir (e.g., anglers might choose to retain only their largest fish). The methods for analyzing the stomach contents are lacking, which raises numerous questions: Will this be a qualitative (e.g. presence or absence) or quantitative (e.g. % composition by number or weight) analysis? What are the diet item categories to be used? Will unidentifiable fish, invertebrate or other amorphous remains be returned from the field for further analysis/identification? How will the biologists be able to accurately quantify the amount of "wasted net pen feed" – uneaten food pellets passing through the nets – in the diet of trout swimming free in the reservoir? That material is especially likely to appear as unidentifiable, particularly if much time has passed between when it is consumed and when the stomachs are opened. Nevertheless, this proposed sampling program with a sufficiently detailed food habits analysis is a high priority and has reasonably high probability of determining if large trout are feeding on smaller fish such as juvenile kokanee passing downstream from Lake Roosevelt.

Overall, however, the material presented to the ISRP was not adequate for a scientific evaluation of the proposal's ability to answer key questions about what the rainbow trout are eating. A proper review would have required a justification of the sample size (what was the basis for selecting 100 samples quarterly?), what steps would be taken to ensure that the full range of trout sizes would be sampled, what protocols will be used in stomach contents analyses, and how the problem of identifying net pen feed in fish stomachs would be handled. The ISRP feels that diet analysis would still be a worthy addition to the Rufus Woods Supplementation and Creel Project, but the information provided failed to meet our scientific criteria.