Independent Scientific Review Panel
for the Northwest Power & Conservation Council
851 SW 6th Avenue, Suite 1100
Portland, Oregon 97204
isrp@nwcouncil.org

August 9, 2005

TO: Doug Marker, Fish and Wildlife Division Director, Northwest Power and Conservation Council

FROM: Rick Williams, ISRP Chair

SUBJECT: ISRP and Montana Department of Fish, Wildlife and Parks (MDFWP) teleconference to Sekokini Springs Master Plan Step Review (ISRP 2005-10 Update)

On July 19, 2005, the ISRP and MDFWP held a teleconference to discuss the ISRP's Interim Reply -- Combined Step Review for *Sekokini Springs Natural Rearing Facility and Educational Center*, Hungry Horse Mitigation, Project #199101903) (see ISRP 2005-10 and 2004-5). John Epifanio, Rick Williams, Eric Loudenslager, Jack Griffith, and Lyman McDonald participated on behalf of the ISRP; Brian Marotz, Bob Snyder, Robb Leary (soon to be MDFWP State Fish Geneticist), and Paul Suek (State Fish Hatchery) participated for MDFWP; Joe DeHerrera for BPA; and Kerry Berg for Montana Council representatives.

Summary

The purpose of the call between Sekokini Springs Hatchery Master Plan project sponsors (MDFWP) and the ISRP was to discuss and clarify a number of issues raised in the ISRP's Interim Reply. It was hoped that the call and discussions would ultimately permit MDFWP to more appropriately and effectively respond to those issues detailed in the Interim Reply. The ISRP appreciated the candid discussion, which focused on MDFWP's proposed strategies to eradicate non-native and hybridized trout populations and to supplant them with westslope cutthroat trout stocks of a more native genotypic constituency.

The next step in the process will be for MDFWP to discuss with Council staff an approach and timeframe to revise the Master Plan addressing ISRP criticisms or uncertainties - especially M&E activities tied to the project's outcome. The ISRP's review comments are encapsulated in this Interim Reply as updated in this memo and discussed during the teleconference. While a goodly number of issues were clarified and perhaps even resolved, the ISRP suggested it would be inappropriate to "sign off" on the current draft of the Master Plan based on the phone call. Changes and modifications need to be memorialized in the document.

More specifically, the discussion identified a potential trouble spot associated with what seems to be evolving approaches as the Master Plan review process has progressed. For example, the original Master Plan draft focused on restoration in streams, and restoration of lakes played a

minor role. Spawning 100,000 fish from collected subsets seemed a lot more than needed to restore a vacated stream habitat. Subsequently, the ISRP was provided a table showing proposed fish released per stream that seemed fairly reasonable; however, it remained unclear how many fish would be released in lakes. The Master Plan needs an accounting of fish produced to fish released. The subsequent MDFWP response to the ISRP's review then looked like the focus was on lakes. The response also looked like it promoted an approach based on genetic swamping. Presently, the approach looks like swamping is no longer a focus. Ultimately, the parties discussed the value of redrafting the plan to accommodate the evolution of ideas and strategies emerging from previous reviews as well as the teleconference discussion. The ISRP does not anticipate that further interaction with reviewers is needed until a revised Master Plan is re-submitted for review.

Primary issues requiring clarification or fuller discussion in the subsequent draft

1. Nearest Neighbor. Brian Marotz noted there appeared to be confusion over the term "nearest neighbor." He stated that as used in the Master Plan, "nearest neighbor" referred to geographic location rather than genetic or phylogeographic relationship. The "nearest neighbor" concept appears to have the most value in cases where the pattern of genetic divergence is concordant with watershed pattern or geographic proximity. Here, however, previous genetic assessments published by Leary and Allendorf (and others from the University of Montana) indicate that westslope cutthroat trout populations display a pattern of genetic divergence that is not especially hierarchically organized by watershed (differences among populations within watersheds are strikingly high relative to differences among populations in different watersheds). Each stream population is essentially a genetically distinct population. Thus, there appears no basic support for the hypothesis that populations more closely located (even within watersheds) are more genetically related. Therefore, a "nearest neighbor" approach, perhaps, has little merit (unless there are new or emerging data to refine the patterns previously observed). Ultimately, Brian Marotz recommended abandoning this terminology within the context of this Master Plan. The ISRP concurs that with this and recommends whatever the brood strategy that is selected, be supported with data and rigorous analysis.

2. Genetic Swamping. Brian Marotz referred to maps provided in the Master Plan that show the historical distribution of westslope cutthroat trout (in green) and populations with significant introgression from headwater streams (in red). He conveyed that previous attempts at "genetic swamping" failed to drive the population to a more "pure" westslope cutthroat trout state, when they didn't have the ability to fully eradicate the hybrid swarm (note: a hybrid swarm is population in which all or most individuals are direct or distant descendents of interbreeding among divergent lineages). As a result, the ISRP was informed that "genetic swamping" was no longer a primary strategy.

Robb Leary suggested that there are data that point to where a different kind of "swamping" may have had some success. Here specifically, he noted that in cases where suppression and eradication was severe, released hatchery stocks appeared to displace the remnant hybrid swarm population. This ecological/demographic pathway has more credibility than what is often referred to as "genetic swamping." Ultimately, such contentions, once supported with analyzed

data, would be a welcome addition to the Master Plan because it could be reviewed for scientific rigor. For example, an additional area of clarification will be needed concerning the effectiveness of pre-release eradication as a requirement for project success. Specifically, how successful are the sponsors in achieving total or substantial eradication or suppression of hybrid swarms? Eric Loudenslager related that the experience in California and the Southwest for success of eradication is somewhat limited (e.g., Paiute trout eradication programs, Gila trout lifeline approaches, Volcano Creek Golden Trout, and others). In fact, there is some skepticism in general as to the efficacy of the approach. If the sponsors are relying on other proven experiences it would be appropriate to cite these.

3. Brood stocks. The third issue revolved around the proposed use of the currently available (and certified "disease free" and non-introgressed) stocks of westslope cutthroat trout – the M012 brood stock. The ISRP had previously alerted sponsors about the concerns of focusing on essentially homogenizing or erasing differences and local adaptations (see issue #1 above) through wide-scale distribution of a common stock. While sponsors indicated there is an intent to augment the allelic diversity of the M012 brood stock with alleles from a number of local stocks/populations, the ISRP also previously highlighted its concerns with this approach in the absence of data to support its efficacy. Ultimately, there is a general concern that while an enhanced M012 brood might capture additional allelic diversity, it would fail to conserve diversity among populations (structural and functional diversity) and increase homogenization in remaining westslope cutthroat trout populations. We also learned that while M012 is derived solely from westslope cutthroat trout, historically the sources included progenitors from multiple watersheds. This explanation, however, appears to focus on the risks to westslope cutthroat trout from exogenous genes (rainbow trout or other cutthroat species) at the expense of maintaining divergent and heterogeneous lineages evolved across watersheds and tributaries.

The sponsors reiterated the fact that the MO12 brood stock is the sole population certified as "pure" westslope cutthroat trout available for production. While the sponsors recognize the merit from multiple population-specific brood stocks, there are some rather tangible obstacles to this approach on a wholesale level. First, is a production limitation due to facilities space and general unavailability of non-introgressed adults from which to construct such local brood stocks? Moreover, the sponsors are faced with two different introgression scenarios - invasion of hybrids from downstream sources in the watershed (e.g., from Hungry Horse reservoir) and invasion from headwater streams from lake stocking of rainbow trout.

Sponsors indicate they need the Sekokini Springs facility to create such distinct local populations representing brood from specific drainages, inferring they don't have the capability with existing facilities to expand to distinct stocks beyond MO12. Apparently this would be done on a rotational basis. Even with the Sekokini Springs facility, the number of stocks presents a logistical problem. While it is not possible to predict and plan for all contingencies, some attention and presentation of the key scenarios will assist the ISRP in assessing the logic pathway and expected or possible outcomes.

Robb Leary offered another complexity, that after examining extant populations, there are only three that are not hybrid swarms. Thus, constructing drainage specific brood stock might not be

feasible. Thus, constructing drainage-specific brood stock might not be feasible in many cases, but there are three potential candidates for use at Sekokini Springs.

4. Translocation and Habitat Issues. Similar to #3 above, sponsors provided some basic support for why translocation of adults or subadults is not feasible on a broad scale (related to brood mining concerns and general availability of seed stock from non-introgressed local sources). Moreover, sponsors provided verbal rationale for why simply focusing on eradication of hybrid populations and habitat rehabilitation alone will not lead to the desired outcome. While well reasoned on the surface, such alternatives deserve some articulation in the Master Plan.

To address the translocation issue, sponsors indicated that they do not want to eradicate a hybrid swarm and then unintentionally reintroduce yet another hybrid stock. Genetically testing each fish for translocations would be intractable for Gordon Creek because of its remoteness. In a hatchery setting, there is a better ability to check for genetic identity. Ultimately, hybrid swarm populations would not be used for either brood stock creation or translocation due to the risk of expanding the hybrid zones.

To address the habitat issue, sponsors indicated that 1,100 miles of suitable habitat is available and isolated above Hungry Horse reservoir in various Wilderness Areas. As such, habitat is not the primary limiting factor, but rather introgression from 21 stocked lakes in approximately five drainages is the primary immediate threat to the westslope cutthroat trout. The sponsor's current plan is to begin eradication efforts in the lakes in 2006 and continue for at least 15 years. The stocked lakes are large and deep; thus, chemical eradication of hybrid swarms in the lakes would be difficult and success is uncertain. However, the sponsors indicated that they have reviewed results from 126 studies on the success of eradication to help guide their efforts. Late season treatments appear to have been especially successful, but there is an ongoing risk of illegal releases by the public, especially restocking with perch. Fortunately, the difficulty for citizens to do so in the Wilderness Areas is high, thus these areas might have the greatest long-term success. As a backup, they plan to inundate the populations with stocked trout. Logistically the only way to do so presently is to use MO12.

5. Monitoring and Evaluation (M&E). Considerable discussion focused on the need, structure, and depth of a well-described M&E component for the program. This project is highly amenable to being undertaken as a well-crafted and monitored experiment. Moreover, the results of these strategies are hypotheses rather than certainties; therefore, the approaches need to be monitored. Sponsors indicate that much of the specifics regarding M&E are contained within the Hungry Horse/Libby plan and the Subbasin Plan. ISRP members familiar with these plans did not recall stream-by-stream designs appropriately randomized with necessary reference streams as controls (EMAP and GRITS approaches may be appropriate here – check with a statistician). Regardless, M&E designs relevant to the Sekokini Study should be synthesized and included as part of the Sekokini Springs Master Plan documents.

Sponsors further indicated the intent of monitoring was to focus on places where they were taking site-specific actions and later to expand to sites that were not being treated. The ISRP noted that critical baseline data may be missed by this plan. Also, genetic monitoring is currently

being conducted longitudinally in the target streams to determine the extent (how far downstream) of the introgression from the upstream lakes. Lastly, they are monitoring lakes to examine how the habitat in the lakes effects selection. Translocation of stream fish to lakes would raise issues of whether the stream fish were best suited genetically to survive in the lakes.

6. Timeframe. The ISRP indicated that there needs to be some explanation of whether all this effort adds up to realistic timeframe operationally with the use of the Sekokini Springs facility.

Sponsors estimated that 100,000 is the maximum number of young the facility will produce in a year. The lakes effort is currently under an EIS, but stocking of some of these is planned. Big Salmon drainage causes unique and significant problems, for which, they don't have time to create drainage specific stocks. Why this is needs to be explained; i.e., is this one of the four described above? Gordon Creek drainage may be a good place to start with the Sekokini Springs hatchery stocks because they currently have non-hybridized populations. The sponsors plan on a sequential process - eradicate, stock with MO12 or drainage specific stock, and let nature take over.