Independent Scientific Review Panel for the Northwest Power Planning Council

Review of the

Final Design of the Shoshone-Bannock/Shoshone-Paiute Joint Culture Facility (Project #9500600)

Step Three of the Northwest Power Planning Council's Three-Step Review Process

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ISRP Step Three (Final Design) Review of the Shoshone-Bannock/Shoshone-Paiute Joint Culture Facility (project #9500600)

Review Process

On January 8, 2001, the Northwest Power Planning Council requested that the ISRP conduct a Step Three review of the Shoshone-Bannock Tribe (SBT) and the Shoshone-Paiute Tribe (SPT) project titled "*Shoshone-Bannock/Shoshone-Paiute Joint Culture Facility (project #9500600)"* The goal of the project is to provide native trout for re-introduction of stocks affected by hybridization, habitat loss, and exploitation on the Duck Valley and Fort Hall Reservations.

The ISRP previously reviewed this project as part of the Fiscal Year 1999 and 2000 Fish and Wildlife Program project selection processes (see attachment 1) and recommended against funding the proposed Joint Culture Facility. The ISRP identified specific problems in the approach and identified data needs that were not addressed by the proposals.

Pacific Northwest National Laboratory conducted the initial Step review. For the present review, the project sponsors were asked to address conditions placed on the project as an outcome to the Step Two decision on May 19, 1998. These conditions include:

- Development of a Monitoring and Evaluation Plan that addresses flexibility for future elements, measurable objectives, project benefits, genetic interactions and fish health.
- Documentation of the current status of redband trout and other fish resources of concern.
- Evaluation and documentation of the potential, including cumulative, impacts on resident trout in the Fort Hall Bottoms.
- An expanded evaluation of the possible incidence of, and magnitude of potential impacts of, whirling disease.
- A literature review of the current knowledge regarding propagation and supplementation of native species.

The primary materials submitted for this review included:

1. *Final Design Drawings - Joint Culture Facility, Step 3 Submittal to the Northwest Power Planning Council*
2. *Joint Culture Facility - Cost Comparison*
3. *Monitoring and Evaluation Plan for the of Shoshone-Bannock/Shoshone-Paiute Joint Culture Facility*
4. Document - *"Status of the Yellowstone Cutthroat Trout on the Fort Hall Indian Reservation and Possible Impacts of the Proposed Reintroduction Program"*
5. Document - *"Joint Culture Facility, Supplemental Information, Section 1. Whirling Disease, Section 2. Life History, Status, Distribution and Propagation Knowledge of Redband Trout and Yellowstone Cutthroat Trout"*

In addition to reviewing these documents, the ISRP referred to the previous review conducted by Pacific Northwest National Laboratory, and the decision document presented to Council on May 19, 1998.

Review Results

Conclusion: Do not move beyond Step 3 and into construction. The submittal did not adequately address the conditions provided in the Council's Step 2 decision, with the exception of the issue of whirling disease. Most concerns raised in the Step 2 review by the Pacific Northwest National Laboratory were not adequately addressed. The ISRP raised similar concerns in its 1999 and 2000 proposal reviews. More importantly, the proposors have not demonstrated that a hatchery is biologically justified to address native species restoration on the Fort Hall and Duck Valley Indian reservations. Production needs of the DVIR (non-native rainbows for put-and-take fisheries in two closed reservoirs) could be addressed through contracting with a variety of existing private or state aquaculture facilities in southern Idaho.

We note that the Joint Culture Facility has received negative recommendations in previous ISRP reviews. The reviews consistently have noted that the potential benefits of the proposed hatchery cannot be described until the status of local fish stocks is more thoroughly established. It remains unclear whether the local ecosystem could support hatchery fish, whether production of hatchery fish could solve the hybridization problem (considered unlikely by previous and current reviews), and whether hatchery production is needed to increase abundance of native cutthroat trout if habitat improvements alone continue to result in increased cutthroat trout abundance. Hatcheries carry well-established biological risks: domestication, disease, displacement of wild fish, potential erosion of genetic fitness of native species broodstock. In addition, experience suggests that hatchery rearing of wild Yellowstone cutthroat or redband trout will be difficult at best. Given these conditions, there remains no clearly articulated argument for biological benefits of the proposed culture facility.

Condition 1: Development of a Monitoring and Evaluation Plan that addresses flexibility for future elements, measurable objectives, project benefits, genetic interactions and fish health.

Review: The Monitoring and Evaluation Plan is inadequate. As a condition to recommending funding for FY 2000, the Council called for development of a monitoring and evaluation plan. The monitoring and evaluation plan should be developed in such a way that it can incorporate future elements of the project. Based on the Step 2 review, it was anticipated that questions about measurable objectives, project benefits, genetic interactions, and fish health would be addressed by this plan. The plan submitted for Step Three review falls short of the Council's expectations and is not scientifically adequate.

The proposal lacks quantitative detail on sampling design, extent, and intensity, as well as a statement of hypotheses the monitoring programs would attempt to evaluate. Little of the material presented in the Monitoring Plan comprised monitoring or evaluation. The plan did describe some aspects of routine hatchery operation. Overall program objectives (p 17) were (besides maintaining broodstocks of Yellowstone cutthroat and redband trout species in a hatchery) to establish 10 self-sustaining populations of Yellowstone cutthroat on Fort Hall Reservation, and 20 redband populations on the Duck Valley Reservation. Additionally, the culture facility would produce 48,000 ten-inch, non-native domestic rainbow catchables produced yearly for put-and-take fisheries in enclosed (terminal) reservoirs on the Duck Valley Reservation. Other critical elements (timetables, return to creel targets for put-and-take fishery, etc.) were not described. The submittal did not adequately describe the enclosed fishery on Fort Hall Reservation that would be stocked with catchable cutthroat. Because much of the Reservation is a wetlands bottom-land habitat, reviewers had considerable concerns with how "closed" these systems actually are.

Condition 2 and 3:

- **Documentation of the current status of redband trout and other fish resources of concern.**
- **Evaluation and documentation of the potential, including cumulative, impacts on resident trout in the Fort Hall Bottoms.**

Review: The submittal did not adequately address this condition. The material provided was rudimentary, and the reviewers were not sure what it was intended to convey.

The document on current status of cutthroat on the Fort Hall Reservation and the possible impacts of a hatchery production-based introduction program provides some information on the current status of cutthroat trout populations, but does not convincingly and quantitatively address the issue of impacts of the proposed programs. Further, the current status information establishes: 1) that native Yellowstone cutthroat are apparently present in some streams on the Reservation, which seems to contradict the argument that hatchery production is needed to reintroduce them, 2) that high degrees of hybridization are common in streams on the reservation, a problem that would need to be addressed for any native trout restoration plan, and 3) that the status information remains incomplete and does not yet seem to be adequate for determining potential benefits or impacts of a hatchery. The document further notes that there is essentially no data on status of redband trout on the Duck Valley Indian Reservation.

Hatchery production and introduction scenarios are premature without this information. A logical investigation sequence for a project of this nature starts with inventories and assessments of distribution, abundance and genetic status for the taxa in question. Those data should then be used to evaluate the status of the entire suite of populations, determine (or estimate) the natural production potential, assess factors limiting current production, and determine whether a role exists in future management plans for artificial production involvement. At present the preliminary and incomplete status information on

Yellowstone cutthroat trout in the Fort Hall Bottoms does not allow any such analysis to be conducted or recommendation for a culture facility to be made. Status information on redband trout in the Duck Valley Indian Reservation are absent from the proposal.

Further, general risks of a culture-facility-based reintroduction program are well established from parallel work with other native vertebrates, and, although they may be minimized, they cannot be totally removed, and may still be unacceptably large. Beyond failing to establish a need for the proposed facility, the project proponents have failed to establish a clearly probable biological benefit to the proposed culture facility. They need to establish, first, the potential for any benefit, and second, that the probable benefit is greater than the probable cost or risk.

Condition 4: An expanded evaluation of the possible incidence of, and magnitude of potential impacts of, whirling disease.

Review: This material was comprehensive and based on an up-to-date synopsis of the very dynamic situation. The analysis did a good job of assessing the risk of contamination of the proposed facility. The design features and the operational protocol proposed to minimize whirling disease risk are well conceived and should be implemented.

The material is largely descriptive of sources of risk and includes many statements that these risks will be reduced through proper operating procedures. The proposal would be strengthened by adding some quantitative analyses of risks of the proposed operations included in a project-specific risk assessment. What is the probability of avoiding whirling disease under various operating scenarios? What is an acceptably low probability?

Any trout present on the site prior to construction should indeed be tested for whirling disease by IDFG, as mentioned on p. 1-11. As addressed by the material provided, the greatest potential for the introduction of whirling disease into the facility will come from the transfer of brood fish into the facility. There is no mention of testing the wild donor populations for whirling disease prior to using some as broodstock. Due to the very real and growing risk involved and the ability of staff at nearby Idaho State University (or elsewhere), testing for the presence of the parasite in fish cartilage should be conducted.

Condition 5: A literature review of the current knowledge regarding propagation and supplementation of native species.

Review: The submittal did not adequately address this condition. The review of current knowledge of propagation and supplementation of native species was extremely superficial and seemed to miss the point of applying this knowledge to the immediate problems of interest: the proposed Joint Culture Facility and supplementation of cutthroat

trout on the Fort Hall Reservation and redband trout on the Duck Valley Indian Reservation.

The entire section entitled "Life History, Status, Distribution and Propagation Knowledge of Redband Trout and Yellowstone Cutthroat Trout" is not as comprehensive as needed for this step review. It contains only 13 citations plus an unclear reference to a website. Only two citations are within the past 5 years. The literature on culture of native species is not considered in any detail, nor are its conclusions, which are quite negative. There are far more data now than even 10 years ago on success of hatcheries in preserving or increasing native stocks of fish. A high proportion of these sorts of projects have not succeeded. When native stocks can be reared in culture, they frequently fail to establish in the wild, and hatchery-produced fish tend to be genetically and ecologically distinct from wild fish and frequently have negative effects on native stocks. An argument can be made for short-term hatchery preservation of endangered stocks, but perhaps not for hatchery production of fish that would result in "self-sustaining populations of native fish". The proposal does note that native species typically do not thrive in hatcheries, thus entering them into a successful aquaculture program has proven to be very difficult.

Some references:

McMichael, G., T. Pearsons, and S. Leider. in press. Behavioral interactions among hatchery-reared steelhead smolts and Oncorhynchus mykiss in natural streams. North Amer. J. Fish. Mgt.

Hutchinson, P. (ed.) 1997. Interactions between salmon culture and wild stocks of Atlantic salmon: the scientific and management issues. ICES J. Marine Sci. 54: 963-1225.

Jonsson, B. 1997. A review of ecological and behavioural interactions between cultured and wild Atlantic salmon. ICES J. Marine Sci. 54: 1031-1039.

McMichael, G., C. Sharpe, and T. Pearsons. 1997. Effects of residual hatchery-reared steelhead on growth of wild rainbow trout and spring chinook salmon. Trans Amer. Fish. Soc. 126: 230-239.

White, R., J. Karr, and W. Nehlsen. 1995. Better roles for fish stocking in aquatic resource management. Pages 527-547 in H. Schramm and R. Piper, eds. Use and effects of cultured fishes in aquatic ecosystems. American Fisheries Society Symposium 15, Bethesda, Maryland.

Attachment 1: Previous ISRP Reviews

Fiscal Year 2000 Response Review

ProjectID: 9500600

Shoshone-Bannock/Shoshone Paiute Joint Culture Facility
Shoshone-Bannock Tribes
Short Description: Planning, development, and operation of a hatchery facility to provide native trout for re-introduction of stocks affected by hybridization, habitat loss, and exploitation on the Duck Valley and Fort Hall Reservations
CBFWA Funding Rec.: $282,621 Sponsor Request: $282,621
ISRP Response Evaluation:
Fund in part. Do not fund objectives 5-8. This proposal received a recommendation for partial funding, with the hatchery component of the proposal not recommended for funding. The reasons for the negative recommendation for the hatchery component (hatchery development and stocking program) were lack of adequate background data on status and trends of currently present native stocks and lack of adequate consideration of jeopardy to them from stocking with hatchery fish.

The respondents say that the work in objectives 1-4, which were approved for funding, "will quantify and further elucidate the known need for production and re-introduction of native Yellowstone cutthroat trout". This statement lacks scientific justification and leads one to question the overall scientific competency of the proposers. Although the work in objectives 1-4 was judged by reviewers to be well justified, of value to fish and wildlife, and scientifically useful, it is disturbing to hear that the proposers already are sure what they will find. This is not sound science. The initial proposal (and others from the Fort Hall Reservation) report positive response of native stocks to on-going habitat improvements. Clear justification for beginning stocking of hatchery fish, which might compromise regeneration of existing stocks, is not established. It might eventually be, but adequate data are lacking.

The respondents further state that reviewers do not understand that put-and-take fishery development will surely relieve pressure on native stocks because they are "not a fisheries manager on the Fort Hall Indian reservation". This is not scientific justification, but rather presentation of insiders' knowledge or opinions as fact to be accepted on faith. It does not pass scientific muster. The response also states that "monitoring would be developed to quantify these effects" (i.e., those of put-and-take fisheries on fishing pressure to native stocks), but monitoring and evaluation plans should be in place and subject to review for scientific adequacy before beginning a stocking program. Otherwise, it may be impossible to estimate its effects.

Completion of Objectives 1-4 will provide information needed to evaluate the need and relevance of continuing with the remaining objectives. It is still unclear how the development of a put-and-take hatchery program will enhance the persistence of native Yellowstone cutthroat and redband trout. There is not adequate scientific justification in the responses to recommend funding of objectives 5-8. Prior inclusion in the FWP doesn't necessarily address the questions of scientific merit.

Fiscal Year 1999 Review

Shoshone-Bannock/Shoshone-Paiute Joint Culture Facility

9500600
ISRP Evaluation: Inadequate
This proposal is for a hatchery facility, but the hatchery does not appear to be technically justified. The proposal is for hatchery production of native stocks of cutthroat trout and for production of rainbow trout for use in put-and-take fisheries. However, the area has a history of ecological problems with resident fish caused by introduction of hatchery rainbow trout. Also, it is not clear that hatchery cutthroat are needed, as native stocks are present, and the genetic and ecological effects of hatchery fish could be problematic. The proposal does give needed consideration to genetics, and, although tasks involve genetic analyses, no geneticists are listed and no methods for this are detailed.

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