

Project Number: 23050

Project Title: Establishing a Regional Salmonid Germplasm Repository for Populations Listed under the Endangered Species Act

Sponsor: Nez Perce Tribe and University of Idaho

ISRP Comment: This proposal does not address imminent risks to ESA stocks by offering direct on-the-ground benefits with one-time funding.

Sponsor Response: The Snake River chinook salmon and steelhead sperm bank has grown into the largest fish germplasm repository in the United States. Because the Snake River sperm bank can no longer accommodate additional populations, the program must be expanded and upgraded to meet this objective. Using the experience gained in the development of the Snake River sperm bank, the objective of this proposal is to immediately establish a regional germplasm repository for ESA-listed chinook salmon and steelhead, bull trout and other rare fishes. A facility to house the proposed Regional Salmonid Germplasm repository will have the capability of evaluating, cryopreserving, storing fish sperm and maintaining the inventory of samples from a large number of populations systemwide in an efficient and secure manner.

This is a high priority project because specific genes or combinations of genes may be lost forever given population trends in significant decline, low levels of abundance and high demographic risk (Kucera and Blenden 1999, NMFS-NOAA 2000). Alternatively, the development of a comprehensive fish germplasm repository for populations at risk can provide a tangible and quantitative solution to this potential loss. Risk of loss of genetic diversity can be reduced by cryopreservation of male salmonid gametes. It is essential that the remaining genetic diversity present within the existing Columbia River basin salmonid populations be maintained. The genetic diversity is critical for the maintenance of current populations and a germplasm repository is the resource for adaptive combinations from which new populations can be established. Cryopreservation will not replace protection and restoration of habitats and ecosystems but could augment transfer of genes from the wild to hatchery populations and provide long-term conservation and management of genetic material of endangered species (Tiersch 1998).

Other countries and agencies have established germplasm repositories for conservation of threatened and endangered species and for species propagation. The Norwegian gene bank of Atlantic salmon has established "living gene banks" for reestablishment or enhancement of threatened stocks (Gausen 1993). United States Department of Agriculture administers plant germplasm repositories, which began pre-1898 and has evolved into the National Seed Storage Laboratory and a regional station network. This program regularly uses cryopreserved genetic material for artificial propagation. The domestic livestock germplasm repositories is a huge industry which uses cryopreserved gametes for successful artificial insemination. The Frozen Zoo at the Center for Reproduction of Endangered Species at the San Diego Zoological Society employs conservation through cryopreservation of endangered species in captivity. The National

Institute of Health uses cryopreserved mice gametes (embryos and sperm) for biomedical research.

Examples of potential uses for the regional salmonid germplasm repository are in captive broodstock programs, conventional hatchery programs to infuse more genetic diversity and in conservation supplementation programs. The immediate availability of the stored genetic material is important for seed stock development to reestablish and build self-sustaining populations through adaptive evolution. This genetic material is the only raw material native to the Columbia River Basin that will be available for potentially repopulating restored watersheds when hydropower dams become obsolete or are replaced with new technologies (Brannon et al. 2000).

One-time funding is for the necessary facilities to house the repository complementing the existing BPA-funded project, which collects the salmonid genetic material. The proposed facility would house the genetic material from returning adults systemwide, offering immediate preservation and availability of ESA listed chinook salmon and steelhead male gametes. Following the building of the regional germplasm repository, the outyear operation/maintenance and monitoring/evaluation would be considered in an umbrella systemwide project with the existing, currently-funded salmonid gamete preservation project (No. 97-038-00).

Literature Cited:

Brannon, E., D. Campton, M. Powell, T. Quinn, and A. Talbot. 2000. Population structure of Columbia River chinook salmon and steelhead trout and application to existing populations. Completion Report, Bonneville Power Administration, Portland, Oregon.

Gausen, D. 1993. The Norwegian Gene Bank Programme for Atlantic Salmon (*Salmo Salar*). Page 182 in J.G. Cloud and G.H. Thorgaard, editors. Genetic Conservation of Salmonid Fishes. Plenum Press, New York.\

Kucera, P.A. and M.L. Blenden. 1999. Chinook salmon spawning ground survey in Big Creek and tributary streams in the South Fork Salmon River, Idaho 1992-1995. Assessment of the status of salmon spawning aggregates in the Middle Fork Salmon River and South Fork Salmon River. Tech. Rep. 99-7. Nez Perce Tribe Department of Fisheries Resources Management. Lapwai, ID.

McClure, B., E. Sanderson, C. Holmes, P. Jordan, P. Kareiva, and P. Levin. 2000. Revised Appendix B of standardized quantitative analysis of the risks faced by salmonids in the Columbia River basin. National Marine Fisheries Service, Northwest Fisheries Science Center, Seattle, Washington. September.

National Marine Fisheries Service. 2000. Biological Opinion. Reinitiation of

consultation on operation of the Federal Columbia River power system, including the juvenile fish transportation program, and 19 Bureau of Reclamation projects in the Columbia Basin. National Marine Fisheries Service, Seattle, Washington. December.

NMFS-NOAA July 17, 2000. Draft Cumulative Risk Initiative.

Tiersch, T. R., C. R. Figiel, W. R. Wayman, J. H. Williamson, G. J. Carmichael, and O.T. Gorman. 1998. Cryopreservation of Sperm of the Endangered Razorback Sucker. Transactions of the American Fisheries Society 127: 95-105.

- **Send your responses to CBFWA at tom@cbfwa.org by 4:30 P.M. Monday, February 12, 2001.**
- **Send your responses to NWPPC at cwinkel@nwppc.org by February 26, 2001.**

From: Paul Kucera <paulk@nezperce.org>
To: GWCB.GWPDX(Tom)
Date: 2/12/01 10:01AM
Subject: Nez Perce Tribe Response to ISRP High Priority Project Proposal Comments

Tom:

The attached file provides Nez Perce Tribe response relative to the ISRP comments on High Priority project proposals. Our comments address projects 23049, 23050, and 23051 which are: Benefit /Risk Analysis to Promote long-term Persistence of Chinook Salmon in the Middle Fork Salmon River; Establishing a Regional Salmonid Germplasm Repository for Populations Listed under the Endangered Species Act; and Assessment and Implementation of Technologies to Monitor Adult Spring and Summer Chinook Salmon Abundance in Snake River Basin Tributary Streams.

Basically, as you know, the ISRP believed none of these met Power Council criteria. We firmly believe that all three are directly related to the NMFS (2000) Biological Opinion on the operation of the federal Columbia River power system. Dave Statler will be at the MMG meeting this week to relay that message.

Please call if you have any questions.

Paul.

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