

**Pacific Coastal Salmon Recovery Fund  
Proposal for Funding a Tribal Genetics Program**

**Tribal Hatchery Genetics Program**

The hatchery genetics program at the Northwest Indian Fisheries Commission (NWIFC) provides vital support to the western Washington Treaty Tribes, Washington Department of Fish and Wildlife, and NMFS Northwest Region for hatchery reform and salmon recovery. The program focuses on

- 1) Identifying and assessing genetic risks for hatchery programs,
- 2) Improving hatchery practices to reduce or eliminate the negative genetic impacts of hatchery produced salmon on naturally spawning populations,
- 3) Coordinating the tribal genetic research on hatchery and natural populations,
- 4) Assisting the development of recovery strategies and plans for ESA-listed populations and other at-risk stocks,
- 5) Integrating management strategies across harvest, hatchery, and habitat management sectors to minimize genetic impacts on natural stocks while maintaining tribal treaty fishing, and
- 6) Developing adaptive management and monitoring plans.

Originally designed to provide genetics, ecological, and statistical expertise for hatchery reform, the program currently consists of two conservation geneticists. Positions dedicated to providing scientific support to minimize the negative ecological impacts of hatchery fish on natural populations while maximizing their survival and benefits and to improve monitoring of hatchery programs and hatchery fish were eliminated in recent years because of the lack of funds to implement hatchery reform science. These issues remain important, however.

Assessing Risks - The NWIFC hatchery genetics program works with individual western Washington tribes to identify risks of their hatchery programs. Geneticists provide technical tools and help interpret the results for individual tribes. They also help gather and analyze information for other review processes, such as the Hatchery Scientific Review Group (HSRG), which conducted an independent review of western Washington hatcheries. The need to improve the scientific tools used for hatchery risk assessments led hatchery reform geneticists from the tribes and Washington Department of Fish and Wildlife to develop state-of-the-art quantitative models that are now being used in evaluations throughout the Pacific Northwest. In addition, part of the work of NWIFC geneticists was used by the HSRG to as a key part of the All-“H”-Analyzer (AHA) model that is being used by fish and wildlife agencies in Washington and Oregon.

Improving Hatchery Practices – Improving hatchery practices is a key element of the hatchery genetics program and is an essential complement to the NWIFC Fish Health program, which monitors fish health and provides fish culture expertise. Staff geneticists work with individual tribal hatchery programs and NWIFC fish pathologists to identify the best sources for brood stock, brood stock collection protocols, and mating protocols that

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reduce or eliminate different kinds of genetic risks to natural populations—such as loss of genetic diversity, outbreeding depression, and domestication—and that maximize the benefits of the hatchery programs for restoring threatened populations or supporting fisheries. An important part of that is implementing and adapting the recommendations of the HSRG review. These improvements are regularly incorporated into revised Hatchery and Genetic Management Plans (HGMP), which document how each hatchery programs is operated and what it needs to do to be consistent with the requirements of the Endangered Species Act.

Hatchery Reform Research – Tribes have opportunities for genetic research to improve hatchery programs and develop restoration strategies. Geneticists from the NWIFC hatchery genetics program support these efforts by suggesting research ideas; reviewing tribal proposals that are being submitted for competitive funding for scientific rigor; working with Washington Department of Fish and Wildlife (WDFW) genetics laboratory to secure funding for genetic analysis of key populations; and analyzing and interpreting genetic data as it becomes available. Both staff geneticists are also actively engaged as peer reviewers of manuscripts on genetics and hatchery reform and they are on the editorial boards of key scientific journals that publish these results.

Recovery Planning - The NWIFC hatchery genetics program also provides support for broader recovery planning activities for ESA-listed populations and other species at risk. NWIFC hatchery geneticists, for example, conducted the genetic analyses used by the NMFS Puget Sound Technical Recovery Team (TRT) for Chinook salmon, Hood Canal and Strait of Juan de Fuca summer chum salmon, and Lake Ozette sockeye salmon. This will likely continue when the new steelhead TRT begins analysis of Puget Sound steelhead, which have recently been listed for protection under ESA. NWIFC geneticists also work with tribes and WDFW to develop and adapt population-specific hatchery recovery strategies in different watersheds.

Integrated Harvest, Hatchery & Habitat Management – Ensuring that threatened species of salmon recover and that populations necessary for the exercise of tribal treaty fishing rights are maintained involves developing complementary management across historically different management sectors that minimize the trade-offs between different risks and benefits. Known as “H-Integration”, NWIFC geneticists are involved in many aspects of this, including working with the Pacific Salmon Commission, WDFW, and tribes on genetic analysis of mixed stocked fisheries; recommending marking rates; and recommending when to initiate or terminate hatchery programs; and educating tribal hatchery and harvest managers about genetic risks.

Monitoring & Adaptive Management – Staff from the NWIFC hatchery genetics program currently provides principal support to the Puget Sound Partnership in developing a regional, ecosystem-based adaptive management program and in implementing monitoring framework for hatcheries that is part of the Puget Sound Salmon Recovery Plan. In addition, staff geneticists work with tribal hatchery programs to monitor genetic concerns in hatchery programs and assemble and archive genetic data. We expect staff commitment to this issue to only increase because of the increasing public demand for accountability and the complex nature of genetics and hatchery management.