

**HATCHERY REFORM IN PUGET SOUND  
AND COASTAL WASHINGTON**

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**Abstract**

The hatchery reform project was funded by the U.S. Congress in 1999 to evaluate Washington State salmon hatcheries. It is a systematic, science-driven redesign of how hatcheries will be used to achieve the goals of: 1) helping to recover and conserve naturally spawning populations, and 2) supporting sustainable fisheries. The project has three components. These components include the Hatchery Scientific Review Group (HSRG), Hatchery Reform Coordinating Committee, and the Facilitation and Communications Group. The HSRG is comprised of five independent scientists and four agency scientists. They are responsible for ensuring hatchery reform is scientifically founded and evaluated, interacting with the agency and tribal scientists to provide direction and operational guidelines, and ensuring that the system as a whole be evaluated for compliance with scientific recommendations. The Coordinating Committee is responsible for helping with implementation by creating a successful working relationship between the HSRG and manager's leadership and staff. The Facilitation and Communications Group role includes providing facilitation and staff support to the HSRG and the Coordinating Committee and communicating hatchery reform progress. Initial work by the HSRG included developing a *Scientific Framework for Artificial Propagation of Salmon and Steelhead*. This document serves as a foundation on which specific hatchery programs are evaluated for consistency with established scientific principles and the objectives of hatchery reform. Companion documents to the Scientific Framework include a Benefit/Risk Assessment Tool, Hatchery Operational

Guidelines, and Monitoring and Evaluation Criteria. All of these tools are being used by the HSRG in a comprehensive hatchery system review.

Key words: hatchery, evaluation, reform

### **Introduction**

There are over 100 hatchery facilities in Puget Sound and Coastal Washington operated by Washington Department of Fish and Wildlife (WDFW), Puget Sound and Coastal Indian Tribes, and United States Fish and Wildlife Service (USFWS). These hatcheries produce more than 100 million juvenile salmon and steelhead (*Oncorhynchus sp.*) every year, playing an important role in the North Pacific sports and commercial fishing economy and in meeting aboriginal treaty harvest obligations. In operation for decades, most hatcheries were built to produce fish for harvest, compensating for declines in wild salmon populations. Hatcheries have generally been successful at fulfilling this purpose. However, they have also been identified as one of the factors responsible for the depletion of wild salmon stocks from interbreeding, competition, spreading disease, and stimulating mixed-stock fisheries (Hilborn 1999; Lichatowich 1999; Taylor 1999).

With several Washington State salmon and steelhead stocks listed or proposed for listing under the United States Endangered Species Act (ESA), state, tribal and federal managers of Washington's salmon and steelhead resources must ensure that their hatcheries do not present a risk to listed species.

### **Methods**

In 1998, the United States Congress adopted and funded the recommendations of a science advisory team, launching the Puget Sound and Coastal Washington Hatchery Reform Project. The project was supported by the United States Congress, Washington State Legislature and the Governor of Washington State.

The hatchery reform effort is a systematic, science-based redesign of how hatcheries should be used as a system to achieve two new goals: 1) helping to recover and conserve naturally spawning populations and 2) supporting sustainable fisheries.

The congressional appropriation language provided funding to:

Establish an independent scientific panel to ensure a scientific foundation for hatchery reform;  
Provide a competitive grant program for needed research on hatchery impacts;  
Support state and tribal efforts to implement new hatchery reforms;  
Provide for the facilitation of a reform strategy by an independent third party, to ensure implementation of reform.

A key element of the reform process is the Hatchery Scientific Review Group (HSRG), the independent scientific panel established by Congress. The objective of the Scientific Group is to assemble, organize and apply the best available scientific information to provide guidance to policy makers who are implementing hatchery reform. The Scientific Group is composed of five independent scientists (selected from a pool of candidates nominated by the Past Presidents Council of the American Fisheries Society) and four agency scientists designated by WDFW, the Northwest Indian Fisheries Commission, and National Marine Fisheries Service (NMFS) and USFWS. Like the independent scientists, the agency scientists are responsible for evaluating scientific merits and are not to represent agency policies. The nine scientists serving on the Scientific Group have a broad range of experience. Their scientific disciplines include biology, genetics, ecology, fisheries management, fish culture, fish pathology, biometrics and other disciplines. Members include:

John Barr, NWIFC (Vice Chair)  
Lee Blankenship, WDFW (Vice Chair)  
Donald Campton, PhD, USFWS  
Trevor Evelyn, PhD, Department of Fisheries and Ocean Canada (retired)  
Conrad Mahnken, PhD, NMFS Manchester  
Lars Mobrand, PhD, Mobrand Biometrics (Chair)  
Robert Piper, USFWS, Bozeman, MT (retired)  
Lisa Seeb, PhD, Alaska Dept. of Fish & Game  
William Smoker, PhD, University of Alaska

A Hatchery Reform Coordinating Committee, comprised of top policy makers at the relevant state, tribal and federal agencies is responsible for implementation of the Scientific Group's recommendations. The purpose of the committee is to ensure a successful working relationship between the independent science panel, a manager leadership and the managers' own hatchery reform science teams and other staff. While the scientists meet monthly, this group meets quarterly to review progress. Their immediate adoption of the twin goals—redesigning the

hatchery system to help recover naturally spawning populations and support sustainable fisheries—was an important early sign of leadership.

The third party facilitator, Long Live the Kings (LLTK), is a private non-profit non-governmental organization. Their role includes providing facilitation and staff support to the scientific panel and the Coordinating Committee; as well as helping the managers and the scientific panel communicate hatchery reform progress to Congress, state legislators, stakeholder groups, and the public.

In the project's first year, the HSRG developed a number of tools to assist with their reviews and for the managers' use. These included: 1) a Scientific Framework that assembles what is and is not known about how hatcheries can and cannot help to recover naturally spawning populations and support sustainable fisheries. The framework was reviewed by over 200 scientists and stakeholders; 2) a Benefit/Risk Assessment Tool that allows the HSRG and the managers to evaluate the relative benefits and risks associated with specific actions and choices in hatchery management in a scientifically sound, methodical manner; 3) a set of Hatchery Operational Guidelines that are consistent with the Scientific Framework, to assure genetic integrity, the prevention of disease, provide new guidelines for optimal fish rearing and administrative functions, and limit adverse ecological impacts; 4) Monitoring and Evaluation Criteria that are to be used to determine the success of a hatchery program. Every facility has the potential to be a scientific research station. These guidelines will provide a blueprint for how to collect and evaluate data relating to the health of out-migrating smolts, stray rates of returning adults, whether or not hatchery rearing has affected fish size and run timing, etc.; and 5) research grants. The HSRG has awarded competitive grants totaling over \$1.7 million to projects that attempt to answer questions raised and gaps in the Scientific Framework.

Without the Hatchery Reform Project, the temptation might have been for the managers to simply identify a series of across-the-board prohibitions, to demonstrate that their hatchery programs do not constitute a "take" under ESA. The HSRG adopted a different tack. They divided Puget Sound and the coast into ten regions, wanting to evaluate the effectiveness of hatchery programs against their stated goals and in the context of the quality of habitat and status of the stocks in each region. The ten regions include:

Eastern Straits  
South Sound  
Stillaguamish/Snohomish Rivers

Skagit River Basin  
Nooksack/Samish Rivers  
Central Sound  
North Coastal  
Hood Canal  
Grays Harbor  
Willapa Bay

The HSRG identified four categories of key questions that need to be answered in order for the group to conduct the regional reviews and to make recommendations based on information about the regions. These categories include: 1) regional management goals for conservation, harvest, and other purposes; 2) stock status (biological significance and population viability of salmonids); 3) current and future habitat; and 4) hatchery programs.

The regional reviews normally take place over two three-day meetings, held in the region over consecutive months. The facilitation team works with the regional managers and state and tribal agency science teams to assemble a briefing book containing the four key categories of background information for the region, arranged by sub-region and species (i.e., Dungeness chinook). The first day of a regional review meeting consists of field tours arranged by the facilitation team and regional managers, to complement the briefing book information and provide the HSRG with a better understanding of the region, its habitat quality, and hatchery facilities.

On the second day, the HSRG meets with the regional participants to apply the Benefit/Risk Tool's Part 1 Worksheet: Summary of Goals for Affected Stocks and Habitat and Objectives for Current Hatchery Programs.

On the final day of the first months meeting, the HSRG completes Part 3 of its Benefit/Risk Tool: How Current Operations compare to the HSRG Guidelines. Categories include: 1) Accountability and Education; 2) Genetics and Conservation; 3) Physiology, Morphology, Ecology; and 4) Culture Methods. Regional hatchery managers join the HSRG during this process to fill in any operations information not provided in the briefing book, tour, or previous discussions.

On the first day of the second monthly regional review meeting, the HSRG reviews the information provided by the managers between meetings to fill in any gaps identified at the first meeting and completes the Part 2 worksheet: Are

current hatchery programs consistent with long-term and short-term goals? This involves identifying the risks and benefits from each hatchery program to all hatchery and wild stocks in the region.

On the fifth day of the review process, the HSRG applies all the information it has been provided or acquired to the Part 4 Worksheet: Recommendations and Alternatives, and makes preliminary decisions about the region's hatchery system. The group then decides how best to present the results to the regional managers at the Informal Review session.

On the final day, the HSRG provides the regional participants with an informal review of the region. The session involves oral recommendations and presentations. No written report is provided at this time. The regional managers have the opportunity to ask questions and engage in discussion.

## **Results**

Three pilot regions were reviewed in the middle of 2001, to test the process. These pilots include the Eastern Straits of Juan de Fuca, Puget Sound south of the Tacoma Narrows, and the Stillaguamish /Snohomish river region.

A final report with the HSRG recommendations for each region was published in January 2002, delivered to Congress, and made available to the public. Recommendations from the HSRG included closure of existing hatcheries, construction of new facilities, elimination of specific specie programs within a hatchery, changing genetic and disease management plans, structural modifications to allow juvenile and adult fish passage, improved water intakes, and construction of pollution abatement ponds. The report also contains responses by the fishery agencies on how they plan to deal with the recommendations.

In each of the pilot regions, the HSRG found significant differences in the quality of the habitat, stock status, and the purposes the managers have prescribed for each region. Hatcheries in one region may be mostly working to restore depleted wild stocks. Another region may have had its habitat permanently compromised by high population density, and use hatcheries primarily to provide fishing opportunity.

Much progress has been made since the Hatchery Reform Project got under way. Most significantly, the managers have embraced this new approach of reforming hatchery programs to provide benefits to the process of recovering wild salmon and supporting sustainable fisheries. After decades of piecemeal hatchery reform efforts in Puget Sound and on the coast, there is finally in place the funding, the independent science, and the leadership needed to knit together these strategies in a systematic effort to meet the twin goals.

Added to this is a regional review process that represents a logical and workable approach to preparing recommendations. Drawing on the detailed knowledge and expertise contained in each region, there is much cause for optimism about what the Puget Sound and Coastal Washington Hatchery Reform Project and the regional review process can achieve. The recommendations that come from this process will help the state and tribes prioritize limited implementation dollars and help them make their case to Congress, the legislature, and private funders for financial support. The recommendations will provide a blueprint for change.

We know hatcheries are not going to solve all of the Northwest's salmon problems. We need to integrate habitat, harvest, and hatchery reforms. But this process can make a valuable contribution to salmon recovery and sustainable fisheries and serve as a model for similar enhancement efforts using hatcheries.

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