

Hatchery Scientific Review Group
Pacific Salmon Hatchery Reform

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Andy Appleby, Co-Chair
Dr. Peter Paquet, Co-Chair
Lee Blankenship, Vice-Chair
Dr. Don Campton
Dr. Ken Currens
Dr. Trevor Evelyn

HSRG - Washington
Dr. Dave Fast
Tom Flag
Dr. Conrad Mahnken
Dr. Lars Moberg
Brian Missildine
Dr. Lisa Seeb
Stephen Smith

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Washington Department of Fisheries and Wildlife
Hatcheries Division
600 Capital Way N.
Olympia, WA 98501

Subject: HSRG Review of Tumwater Falls Fall Chinook HGMP

A subcommittee of the Hatchery Scientific Review Group (HSRG) has reviewed the Tumwater Falls Fall Chinook Hatchery and Genetic Management Plan (HGMP), dated January 16, 2013. The principles and recommendations developed by the HSRG during their review of the Columbia River Basin hatcheries (HSRG 2009) were used as a template to organize information from review of this HGMP. The HSRG reviewers were asked to compare the consistency of the Tumwater Falls Fall Chinook HGMP with the principles and recommendations developed by the HSRG for hatchery operations for the Columbia River Basin. The results are as follows:

Principles and System-Wide Recommendations

The HSRG's three principles for hatchery management are presented below, with each of 17 system-wide recommendations (applicable to programs across the Columbia River Basin hatchery system) listed under the principle from which it is derived. These principles and system-wide recommendations represent the key findings of the HSRG during its review of Columbia River Basin hatcheries, but are applicable to all hatchery programs. Hatchery programs that adhere to these principles and recommendations are more likely to contribute to the managers' harvest and conservation goals.

Principle: Develop Clear, Specific, Quantifiable Harvest and Conservation Goals for Natural and Hatchery Populations within an “All H” Context.

“During its reviews, the HSRG observed that goals for fish populations were not always explicitly communicated and/or fully understood by the managers and operators of hatchery programs. These goals should be quantified, where possible, and expressed in terms of values to the community (harvest, conservation, education, research, etc.). At times, goals have been expressed in terms of the numbers of smolts to be released without specifying whether or how this hatchery production contributes to harvest and/or conservation. Hatchery production numbers may be the means of contributing to harvest and/or conservation values, but they are not endpoints. When population goals are clearly defined in terms of conservation and harvest, hatcheries can be managed as tools to help meet those goals.”

“To be successful, hatcheries should be used as part of a comprehensive strategy where habitat, hatchery management and harvest are coordinated to best meet resource management goals that are defined for each population in the watershed. Hatcheries are by their very nature a compromise—a balancing of benefits and risks to the target population, other populations, and the natural and human environment affected by the hatchery program. Use of a hatchery program is appropriate when the benefits significantly outweigh the risks and when the benefit/risk mix from the program is more favorable than the benefits/risks associated with non-hatchery strategies for meeting the same goals.”

Recommendation 1: *Express conservation goals in terms of a population’s biological significance (Primary, Contributing, Stabilizing) and viability (natural-origin spawning abundance and productivity).*

Comment: There is no natural population associated with this program, therefore no conservation goals (except for straying to other basins). It is assumed to be a stabilizing population (adults in excess of brood needs are passed upstream and allowed to spawn naturally (Section 7.5, page 20).

“The program was designed to provide Chinook salmon for fisheries harvest. To suit this purpose, fish were transplanted to create a population in place where natural fall Chinook population was not historically present. Green River hatchery-lineage populations were used since they reproduced well and were available for transfers at the time. Currently, program uses locally-adapted hatchery stock established in and returning to the Deschutes River” (Section 6.2.5, page 19).

Recommendation 2: *Express harvest goals in terms of a population’s contribution to specific fisheries.*

Comment: The HGMP lacks specific quantifiable goals for contribution to specific fisheries. Section 1.7 identifies Goal of program as “Harvest Augmentation” and Section 1.10 “Performance Indicators”, (Table 1.10.1, 3.1.1) further identifies “co-manager harvest” and “Program contributes to fulfilling tribal trust responsibility mandate”. Managers should specify numbers of fish contributed to specific fisheries, or at a minimum total number of fish expected to be harvested. However, it is clear that a significant portion of the fish produced by the program (41%) is harvested, as intended, in Puget Sound (Table 3.3.1.1).

Recommendation 3: *Ensure goals for individual populations are coordinated and compatible with those for other populations in the Region.*

Comment: The HGMP cites *U.S v Washington* and the *Puget Sound Salmon Management Plan* (PSSMP 1985) as providing the legal framework for coordinating hatchery programs in the Region (Section 3.2, page 13). However, these plans are aimed at coordinating harvest and harvest opportunity and do not reflect the conservation issues that may arise from large scale hatchery programs in most of the watersheds within Puget Sound.

Several salmon recovery planning process are listed (Section 3.4, page 19), but no description is provided as to how they may affect hatchery production at Tumwater Falls Hatchery.

Principle: Design and Operate Hatchery Programs in a Scientifically Defensible Manner.

“Once a set of well-defined population goals has been identified, the scientific rationale for a hatchery program (in terms of benefits and risks) must be formulated, explaining how the program expects to achieve its goals. The purpose, operation and management of each hatchery program must be scientifically defensible. The strategy chosen must be consistent with current scientific knowledge. Where there is uncertainty, hypotheses and assumptions should be articulated.”

“Scientific defensibility should be a central consideration throughout all phases of a hatchery program—when determining whether a hatchery should be built or a program initiated; during the hatchery or program planning and design phase; and during the operations phase. This ensures a scientific foundation for hatchery programs, a means for addressing uncertainty, and a method for demonstrating accountability. Documentation for each program should include a description of analytical methods and should be accompanied with citations from the scientific literature.”

Recommendation 4: *Identify the purpose of the hatchery program (i.e., conservation, harvest or both).*

Comment: The program is identified as a Harvest program (Section 1.7, page 3).

*“Harvest Augmentation. The goal of this program is to provide adult fish for sustainable fisheries (Magnuson/Stevens Act) and *US v Washington* 1974 (tribal harvest opportunity) in deep South Puget Sound, including Budd Inlet.”*

Recommendation 5: *Explicitly state the scientific assumptions under which a program contributes to meeting the stated goals.*

Comment: The rationale to support the harvest goal is provided in several places (Section 1.8, 1.12, 3.3).

Recommendation 6: *Select an integrated or segregated broodstock management strategy based on population goals and hatchery program purpose.*

Comment: The program is identified as a segregated program (Section 1.6, page 3). However, CWT marking of the fish to evaluate straying from this large program has ceased. The program managers should indicate why this is the case. Did CWT marking indicate that straying was not a serious problem? This issue should be dealt with here in the HGMP.

Recommendation 7: *Size hatchery programs based on population goals and as part of an “all H” strategy.*

Comment: The current production goal of 3.8 million smolts appears to be based on facility capacity, which is consistent with managing a hatchery program where no native population is present.

Recommendation 8: *Manage harvest, hatchery broodstock and natural spawning escapement to meet HSRG standards appropriate to the affected natural population’s designation.*

Comment: Current management is consistent with a stabilizing population.

Recommendation 9: *Manage the harvest to achieve full use of hatchery-origin fish.*

Comment: Table 3.3.1.1 (page 19) provides recent average harvest in Eastern Pacific fisheries and a total exploitation rate of approximately 83% (sub-yearlings). This estimate seems too high based on hatchery escapement data provided in Section 1.12. Given that the hatchery typically exceeds its broodstock requirements by 7,187 (Table 1.12.2, page 9), it does not appear that hatchery fish are managed to achieve “full” use.

Recommendation 10: *Ensure all hatchery programs have self-sustaining broodstocks.*

Comment: The program has achieved broodstock goals for at least the last 12 years (table 7.4.2.1, page 20).

Recommendation 11: *Coordinate hatchery programs within the Regions ecosystem to account for the effects of all hatchery programs on each natural population and each hatchery program on all natural populations.*

Comment: Section 3 of the HGMP describes the coordination of hatchery production in the Region to achieve adherence to *U.S. v Washington*, which provides the legal framework for

coordinating these programs. The *Comprehensive Management Plan for Puget Sound Chinook* (WDFW 2004) provides the legal framework for defining artificial production objectives, yet neither document addresses genetic or ecological impacts of hatchery production on natural populations (Tumwater Falls Fall Chinook straying to other basins). In addition, Section 3.4 (Relationship to habitat protection and recovery strategies) incorrectly, we believe, identifies the Tumwater Falls Hatchery program as being included under the co-managers' **Non-Chinook** (emphasis added) Resource Management Plan (RMP) for Puget Sound region **non-Chinook** (emphasis added) salmon hatchery programs.

The description of the *Hatchery Action Implementation Plans (HAIPs)*, in this section does indicate considerations given to this topic; however, that document was not linked to the HGMP, nor provided.

Recommendation 12: *Assure that facilities are constructed and operated in compliance with environmental laws and regulations.*

Comment: NPDES guidelines with regard to effluents appear to be adhered to (Section 4.2, page 17).

Recommendation 13: *Maximize survival of hatchery fish consistent with conservation goals.*

Comment: Fish appear to be released at a time and size aimed at maximizing survival for fall Chinook reared at Puget Sound hatcheries (Section 10.3, page 26).

Principle: Monitor, Evaluate and Adaptively Manage Hatchery Programs.

“In addition to establishing resource goals and a defensible scientific rationale for a hatchery program, the HSRG recommends that the managers’ decisions be informed and modified by continuous evaluation of existing programs, changing circumstances and new scientific information. Decisions about hatcheries must also be made in a broader, integrated context and hatchery solutions must meet the test of being better, in a benefit/risk sense, than alternative available means to meet similar goals. Systems affected by hatchery programs are dynamic and complex; therefore, uncertainty is unavoidable. The only thing certain is that the unexpected will occur.”

Recommendation 14: *Regularly review goals and performance of hatchery programs in a transparent, regional, “all-H” context.*

Comment: The HGMP describes a process for updating information on survival, contribution to fisheries and contribution to natural spawning areas for this program. However, due to lack of clear harvest goals, it is unclear how these data will be used to modify the program (Section 11, page 28).

Recommendation 15: *Place a priority on research that develops solutions to potential problems and quantifies factors affecting relative reproductive success and long-term fitness of populations influenced by hatcheries.*

Comment: No ongoing research was described (Section 12, page 29). However, given the poor survival of Tumwater Falls fall Chinook relative to other nearby hatchery programs (Nisqually) as well as historical performance from this facility, it appears research into survival would be appropriate.

Recommendation 16: *Design and operate hatcheries and hatchery programs with the flexibility to respond to changing conditions.*

Comment: While a list of data to collect for monitoring the program is briefly described (Section 11, Section 1.10), no description is given as to how this data will be used. No performance targets (harvest goals) were provided.

Recommendation 17: *Discontinue or modify programs if risks outweigh the benefits.*

Comment: This program has been ongoing since 1946 and there is no indication that it will be discontinued, regardless of risks. Section 1.16 identifies alternatives considered for attaining program goals, but elimination of the program was not considered.