

Draft Framework  
Comprehensive Regional Management Plans  
Component 1. Regional Hatchery Action Implementation Plan  
October 1, 2008

**Project Goal:** Describe the sequence of actions (through the year 2029) supported by the Washington Department of Fish and Wildlife (WDFW) and western Washington treaty tribes to align salmon and steelhead artificial production programs with:

- objectives for the status of salmon and steelhead populations
- recovery plans;
- recommendations of the Hatchery Scientific Review Group and other hatchery reviews;
- environmental regulatory requirements;
- sustainable fishery benefits; and
- the Puget Sound Management Plan’s Equilibrium Brood Document and shared data requirements of the Hoh v. Baldrige Framework Management Plan.

The actions may include artificial production program modifications, improvements to hatchery facilities, maintenance of existing hatchery facilities, and improvements in hatchery monitoring.

The plans will be scientifically-based, with actions developed in a framework that integrates fishery management plans and actions, hatchery management and other enhancement programs and actions, habitat restoration programs and actions, and habitat protection authorities and actions.

**Primary Audience:** Tribal and WDFW policy leaders, Washington Fish and Wildlife Commission, Governor’s Office, congressional delegation and staff, legislative representatives and staff, regional and watershed recovery planning groups, and Lead Entities.

**Report Uses:** The report will be used: a) as supporting documentation for coordinated funding requests to implement comprehensive hatchery management; b) as a communication tool to elected officials, constituents, and watershed groups; c) as an umbrella for more detailed actions tracked by WDFW and the tribes in Managing for Success, Habitat Work Schedule, and other systems; and d) the source document for artificial production related projects in watershed three-year implementation plans.

**Geographic Scope:** Chapters of the plan will be developed primarily at a river basin (or aggregate of river basins and marine areas) scale for hatchery programs operating in tributaries to Puget Sound, the Strait of Juan de Fuca, and the Washington Coast (Water Resource Inventory Areas 1-23). For simplicity, the chapters of the plan are identified as “watersheds” in the remainder of this document. Proposed chapters, contacts, and team members are summarized in Attachment 1.

**Deliverable:** Plan chapters will include the following elements.

Goals & Objectives:

- a) A list of salmon and steelhead populations, with short- and long-term objectives for the status of each population. Where available, these objectives will be obtained from existing recovery plans or the associated implementation plans. Population objectives will be expressed in terms of abundance, productivity, diversity, and spatial structure (i.e., viable salmonid population (VSP) parameters) developed in the context of the role of the population in achieving conservation goals at larger geographical scales (i.e., regional, Evolutionarily Significant Units, or Distinct Population Segments).
- b) A list of artificial production programs with the objective for each program (i.e., conservation, fisheries, research, or educational) and a discussion of the desired economic, ecological, and cultural benefits of the artificial production program.

Assessment:

- c) The current status of each natural population in relation to objectives for abundance, productivity, diversity, and spatial structure.

Strategies & Actions:

- d) The broodstock management strategy (i.e., segregated or integrated) for each artificial production program.
- e) The sequence of hatchery program changes and facility improvements to achieve population objectives, comply with environmental regulatory requirements, and provide sustainable fisheries.
- f) Testable hypotheses for aspects of the plan with substantive uncertainty in benefits and/or risks. These may include ecological interactions, contributions to fisheries, and the effects of integrated programs on the productivity of natural populations.

Research, Monitoring, & Adaptive Management

- g) A schedule for indicators to meet benchmarks for integrated populations and critical habitat affected by hatchery, habitat, and fishery actions. Implementation benchmarks as well as benchmarks for VSP parameters, proportionate natural influence (PNI), and ecological interactions will be listed.
- h) A succinct description of the monitoring and research necessary to assess achievement of benchmarks and test hypotheses for aspects of the plan with substantive uncertainty.
- i) An adaptive management plan describing how the results from research and monitoring will be used to modify the implementation the artificial production programs.

The plan will be updated every five years to adaptively manage hatchery reform and incorporate new information on fishery management, habitat, and project costs.

**Schedule:** Final plan completed by December 2009 as reference for 2011 Pacific Coastal Salmon Recovery Fund (PCSRF) application and as documentation for the WDFW 09-11(11-13) state budget request.

**Watershed Teams:** Tribal representatives and biologists, NWIFC hatchery reform technical staff, Regional Fish Program Manager, District Fish Biologist, Hatchery Complex Manager, WDFW Watershed Steward, WDFW Hatchery Evaluation and Assessment Team staff, and any other individuals necessary for the analysis.

**Plan Development Process:** Chapters for the plan will be developed on a watershed basis (see Attachment 1). Supplementary analyses and discussion will occur, as appropriate, at a broader Puget Sound and Washington coastal scale.

***Step 1. Watershed Team: Develop a common understanding of the content, time frame, and development process for the hatchery reform implementation plan.***

The purpose of the initial step is to assure that all participants share a common understanding of the objectives, time frame, and process for completing the hatchery reform implementation plan as well as a common understanding of how this plan fits in with overall watershed goals. The initial meeting also provides an opportunity to discuss broad policy conservation and fishery goals for the watershed.

***Step 2. Watershed Team: Identify and categorize natural populations in the watershed relative to their role in meeting regional conservation and fishery goals.***

Drawing from recovery plans, resource management plans, the Salmonid Stock Inventory (SaSI), Hatchery Genetic Management Plans (HGMPs), and other relevant documents, the watershed team will identify the natural populations in the watershed and provide a preliminary categorization for the role of population in contributing to regional conservation and fishery goals (see Table 1 and additional discussion in Step 4). Categorizing the status of a population in terms of VSP parameters and the role of the population in regional conservation goals is an important step because it helps inform policy discussions regarding hatchery program modifications.

Recovery plans have often categorized natural populations relative to the role the population will play in the recovery of an Evolutionarily Significant Unit (ESU). For example, the NOAA supplement to the recovery plan for Puget Sound Chinook states “The ESU viability criteria recommended by the PSTRT do not require that all 22 populations reach a low risk status over time, but all of them have to improve from current conditions.”

Decisions regarding the risk status are based on population characteristics (e.g., “Does the population have unique run timing?”; “Was it historically the largest population in the ESU?”), the current status of habitat supporting the population, and the projected status of the habitat in the future.

The Willamette-Lower Columbia Technical Recovery Team built on these concepts by developing the following categories for populations:

**Primary populations** are those that would be restored or maintained at high (95-99% probability of persistence over 100 years) or “high+” (>99% probability of persistence over 100 years) viability.

**Contributing populations** include those of low to medium significance and viability (75-94% probability of persistence over 100 years) where improvements can be expected to contribute to recovery.

**Stabilizing populations** are those that would be maintained at current levels (may be low viability).

This categorization system provides a helpful framework for weighing the direct and indirect benefits and risks of hatchery programs with conservation objectives for natural populations.

***Step 3. Watershed Team: Identify and categorize hatchery programs in the watershed by goal and broodstock management strategy.***

Hatchery goals and broodstock management strategies have been identified in documents such as HGMPs, HSRG reviews, recovery plans, and in older Equilibrium Brood Documents. Goals include harvest, conservation, research, and education. The two broodstock management strategies are segregated or integrated.

***Step 4. Watershed Team: Identify alternative strategies for combining hatchery actions, fishery management actions, and habitat restoration and protection actions that affect each natural population in the watershed.***

These alternative strategies provide the opportunity to discuss and analyze a range of management options. All alternatives will be linked to actions resulting from implementation of recovery plans or other federal, tribal, state, and local plans.

Three general implementation strategies are possible depending on the watershed:

Integrated Recovery: Habitat protection and restoration are paramount to recovery of natural populations. This strategy requires projecting improvements in habitat quality and quantity resulting from habitat restoration and protection to increase the production of natural origin fish. Integrated populations with degraded habitat cannot be managed solely for genetic broodstock management criteria, (PNI, pHOS, or gene flow (GF) as described in Table 1), until the natural segment of the population’s habitat is restored to the extent needed to produce sufficient natural origin fish to work toward genetic broodstock management criteria, while still meeting other management goals such as harvest. Additional management criteria such as ecological benefits and risks (e.g., marine-derived nutrients, prey, predation, and competition), to the extent they have been determined; and environmental regulations, will be addressed as habitat and the production of natural origin fish are being improved. This alternative would be evaluated relative to policy goals for the watershed in Step 5.

Enhanced Fishery Benefits: This alternative will identify hatchery program modifications that could provide fishery benefits. This alternative would be evaluated relative to policy goals for the watershed in Step 5.

Fully Functional Habitat: If land use practices have been optimized to allow sufficient habitat protection and restoration, and harvest goals are being met, the hatchery program will be the remaining focus to meet management criteria for population status, genetic broodstock management, ecological benefits and risks and environmental regulations. With habitat and harvest goals being met, the conservation objective (as described in Table 1) will be the primary requirement. This alternative would be evaluated relative to policy goals for the watershed in Step 5.

Table 1. Broodstock management criteria for Proportionate Natural Influence (PNI), proportion hatchery-origin spawners (pHOS), or rate of gene flow<sup>1</sup> (GF) for each category of natural population that has associated hatchery programs. Populations will be brought toward PNI goals by increasing the number of natural origin recruits used in hatchery broodstock consistent with maintaining sufficient natural origin recruits on the spawning ground, and toward pHOS goals by recovery of natural populations, particularly through habitat preservation and restoration.

Affected Natural Population Type	Broodstock Management Strategy	
	Integrated	Segregated
Primary	PNI > 0.70	pHOS < 0.05 GF < 0.02
Contributing	PNI > 0.50	pHOS < 0.10 GF < 0.04
Stabilizing	PNI ≥ current	pHOS and GF ≤ current

<sup>1</sup> Gene flow is the rate at which genetic material flows from one population, population component or group of populations to another (see Scott and Gill (2006) for the mathematical formulation of gene flow). Gene flow is a more appropriate criterion than pHOS where a substantial difference exists between the spawn-timing of the hatchery and natural populations (e.g., hatchery programs operated with early-timed broodstock like Chambers or Skamania).

***Step 5. Watershed Team: Choose preferred alternative.***

Select an implementation strategy by using appropriate tools and information sources (i.e., integration tools such as the All-H Analyzer, the Monitoring and Adaptive Management Approach (MAMA) for Puget Sound Chinook, recovery plans) and comparing the different scenarios by performance (costs, benefits, consistency with Treaty obligations) of each alternative over the next 20-years.

***Step 6. Compile and assess alternatives.***

Compile and assess all alternatives from a regional perspective (i.e., all watershed chapters from Puget Sound, the Strait of Juan de Fuca, and the Washington Coast). This assessment will consider interactions between watersheds, recovery plans, fishery and hatchery management plans in the same and other watersheds, habitat restoration programs, habitat protection authorities, and likely levels of funding.

***Step 7. Finalize Hatchery Reform Implementation Plan***

Write a draft of the plan as outlined in the “deliverable” section above. Present this plan to the local watershed groups and other interested parties outside of the comanager community for feedback and comments. One important purpose of this is to help assure consistency of this plan with existing plans and programs for salmon recovery, harvest management, habitat restoration, and habitat protection. Revise the plan based on these comments as appropriate.

Table 2. Proposed watershed workgroups for the Hatchery Reform Implementation Plan. Team lead identified in bold.

<b>Watershed Chapter</b>	<b>WDFW Staff</b>	<b>Tribal Staff</b>
Nooksack-Samish	<b>Annette Hoffmann</b> , Ted Thygesen, Brett Barkdull, Steve Seymour, Kent Dimmitt	Adrian Spidle and/or Ken Currens (NWIFC) <b>Allan Chapman</b> <b>Ned Currence</b>
Skagit	<b>Annette Hoffmann</b> , Ted Thygesen, Brett Barkdull, Bob Warriner, Kent Dimmitt	Adrian Spidle and/or Ken Currens (NWIFC)
Stillaguamish	<b>Annette Hoffmann</b> , Doug Hatfield, Peter Verhey, Doug Hennick, Kent Dimmitt	Adrian Spidle and/or Ken Currens (NWIFC) <b>Kip Killebrew (Stillaguamish)</b> Kit Rawson (Tulalip) Mike Crewson (Tulalip)
Snohomish	<b>Annette Hoffmann</b> , Doug Hatfield, Peter Verhey, Doug Hennick, Kent Dimmitt	Adrian Spidle and/or Ken Currens (NWIFC) <b>Kit Rawson (Tulalip)</b> <b>Mike Crewson (Tulalip)</b>
Lake Washington-Green	<b>Annette Hoffmann</b> , Brodie Antipa, Doug Hatfield, Steve Foley, Kirk Lakey, Andy Appleby, Kent Dimmitt	Adrian Spidle and/or Ken Currens (NWIFC)
East Kitsap	<b>Annette Hoffmann</b> , Denis Popochock, Thom Johnson, Doris Small, Kent Dimmitt	Adrian Spidle and/or Ken Currens (NWIFC)
Puyallup	<b>Bill Freymond</b> , Brodie Antipa, Hal Michael, Bob Burkle, Kent Dimmitt	Adrian Spidle and/or Ken Currens (NWIFC)
Nisqually	<b>Bill Freymond</b> , Hal Michael, Bob Burkle, Kent Dimmitt	Adrian Spidle and/or Ken Currens (NWIFC)
South Sound (Deschutes, Chambers, Minter, Squaxin Pens)	<b>Bill Freymond</b> , Rich Eltrich, Denis Popochock, Bob Burkle/Chad Stussy, Hal Michael, Kent Dimmitt	Adrian Spidle and/or Ken Currens (NWIFC)
Hood Canal	<b>Bill Freymond</b> , Rich Eltrich, Thom Johnson, Doris Small, Andy Appleby	Adrian Spidle and/or Ken Currens (NWIFC)
Elwha-Dungeness	<b>Bill Freymond</b> , Denis Popochock, Mike Gross, Michael Blanton, James Dixon	Adrian Spidle and/or Ken Currens (NWIFC)
Hoko-Sooes-Ozette	<b>Bill Freymond</b> , Denis Popochock, Mike Gross, Michael Blanton, James Dixon	Adrian Spidle and/or Ken Currens (NWIFC)

Quillayute	<b>Bill Freymond</b> , Denis Popochock, Mike Gross, Michael Blanton, James Dixon	Adrian Spidle and/or Ken Currens (NWIFC)
Hoh	<b>Bill Freymond</b> , Randy Aho, Mike Gross, Michael Blanton, James Dixon	Adrian Spidle and/or Ken Currens (NWIFC)
Queets-Quinault	<b>Bill Freymond</b> , Randy Aho, Mike Gross, Bob Burkle, James Dixon	Adrian Spidle and/or Ken Currens (NWIFC)
Grays Harbor	<b>Kirt Hughes</b> , Randy Aho, Bruce Sanford, Chad Stussy, James Dixon	Adrian Spidle and/or Ken Currens (NWIFC)

#### References

Anadromous populations and programs. Draft report available at Scott, J.B, Jr. and W.T. Gill. 2008. *Oncorhynchus mykiss*: assessment of Washington State's