Summary

Draft Environmental Impact Statement to Analyze Impacts of NOAA's National Marine Fisheries Service Proposed 4(d) Determination under Limit 6 for Five Early Winter Steelhead Hatchery Programs in Puget Sound

Introduction

Steelhead have been produced in Puget Sound hatcheries since the early 1900s. The benefit of hatcheries at the outset was to produce hatchery-origin fish for harvest purposes. Hatcheries have contributed 70 to 80 percent of the catch in coastal salmon and steelhead fisheries. As the fish's natural habitat was degraded by human development and activities like passage barriers, forest practices, and urbanization, the role of hatcheries shifted toward mitigation for lost natural production and reduced harvest opportunity. Hatchery production presents risks to natural-origin steelhead. These include genetic risks from hatchery-origin fish to natural-origin fish as a result of poor broodstock and rearing practices, risks of competition with and predation on naturally spawned populations, and incidental harvest of natural-origin fish in fisheries targeting hatchery-origin fish.

The Washington Department of Fish and Wildlife (WDFW) and the Puget Sound treaty tribes (hereafter referred to as the co-managers) have jointly submitted to the National Marine Fisheries Service (NMFS) hatchery and genetic management plans (HGMPs) for five hatchery programs that would produce earlyreturning ("early") winter steelhead in Puget Sound. The HGMPs describe the hatchery programs, including fish life stages produced and potential research, monitoring, and evaluation actions to minimize the risk of negatively affecting listed salmon and steelhead (Table S-1). The HGMPs have been submitted for review and approval as resource management plans (RMPs) under Limit 6 of the 4(d) Rule under the Endangered Species Act (ESA). The plans are consistent with the framework of *United States v.*

Washington (1974) for coordination of treaty fishing rights, non-tribal harvest, artificial production objectives, and artificial production levels.

Table S-1. ESA status of listed Puget Sound salmon and steelhead.

Species	ESU/DPS	Current Endangered Species Act Listing Status
Chinook salmon (*Oncorhynchus tshawytscha*)	Puget Sound	Threatened (76 Fed. Reg. 50448, August 15, 2011)
Chum salmon *(O. keta)*	Hood Canal summer-run (includes Strait of Juan de Fuca summer-run)	Threatened (76 Fed. Reg. 50448, August 15, 2011)
Steelhead (*O. mykiss*)	Puget Sound	Threatened (76 Fed. Reg. 50448, August 15, 2011)
Coho salmon (*O. kisutch*)	Puget Sound/Strait of Georgia	Species of Concern (69 Fed. Reg. 19975, April 15, 2004)

Source: NMFS

NMFS's determination of whether the HGMPs submitted as RMPs achieve the conservation standards of the ESA, as set forth in Limit 6 under the salmon and steelhead 4(d) Rules, is the Federal action requiring National Environmental Policy Act (NEPA) compliance. Although this environmental impact statement (EIS) itself will not determine whether the HGMPs submitted as RMPs meet ESA requirements—those determinations are made under the specific criteria of the ESA and the section 4(d) Rule—the analyses within the EIS will inform NMFS, hatchery operators, and the public about the current and anticipated cumulative environmental effects of operating the five early winter steelhead hatchery programs under the full range of alternatives.

What are 4(d) rules?

Section 4(d) of the ESA directs NMFS to issue regulations to conserve species listed as threatened. This applies particularly to "take," which can include any act that kills or injures fish, and may include habitat modification. The ESA prohibits any take of species listed as endangered, but some take of threatened species that does not interfere with survival and recovery may be allowed.

The salmon and steelhead 4(d) rules apply take prohibitions to all actions except those within the 13 limits to the rules. The limits, or exemptions, describe specified categories of activities that contribute to conserving listed salmon. A separate, but closely related, tribal 4(d) Rule creates an additional limit for tribal RMPs.

Limit 5 of the 4(d) Rule, using specific criteria, provides limits on the prohibitions of "take" for a variety of hatchery purposes, based on NMFS' evaluation and approval of HGMPs submitted by hatchery operators. Limit 6 of the 4(d) Rule provides limits on the prohibitions of "take" for joint tribal and state plans developed under *United States v. Washington* processes, including artificial production actions.

Proposed Action

Under the Proposed Action, NMFS would make a determination that the HGMPs submitted as RMPs, meet the requirements of Limit 6 under the 4(d) Rule of the ESA. The HGMPs for Puget Sound hatcheries would be implemented by the co-managers.

Project Area

The project area covered in this EIS includes the places where the proposed steelhead hatchery programs would (1) collect broodstock; (2) spawn, incubate, and rear fish; (3) release fish; or (4) remove surplus hatchery-origin adult steelhead that return to hatchery facilities; and (5) conduct monitoring and evaluation activities. The project area includes the Dungeness, Nooksack, Stillaguamish, Snohomish/Skykomish, and Snoqualmie River basins. Portions of 5 counties in Washington State are included. These five hatchery programs operate using eight hatchery facilities, and would produce 620,000 juvenile steelhead per year.

Purpose and Need

NMFS's purpose for the Proposed Action is to ensure the sustainability and recovery of Puget Sound salmon and steelhead by conserving the productivity, abundance, diversity, and distribution of listed species of salmon and steelhead in Puget Sound.

NMFS's need for the Proposed Action is to:

- Respond to the co-managers' request for an exemption from take prohibitions of section 9 of the ESA for their hatchery programs triggered by submission of HGMPs as RMPs under Limit 6 of the 4(d) Rule.

- Provide, as appropriate, tribal and non-tribal fishing opportunities as described under the state and tribal co-managers' Puget Sound Salmon Management Plan implemented under *United States v. Washington.*

The co-managers' purpose in developing and submitting HGMPs and submitting them as RMPs under Limit 6 is to operate their hatcheries to meet resource management and protection goals with the assurance that any harm, death, or injury to fish within a listed evolutionarily significant unit (ESU) or distinct population segment (DPS) does not appreciably reduce the likelihood of a species' survival and recovery and is not in the category of prohibited take under the ESA's 4(d) Rule.

What is an ESU? What is a DPS?

NMFS lists salmon as threatened or endangered according to the status of their evolutionarily significant units (ESUs). An ESU is a salmon population that is 1) substantially reproductively isolated from conspecific populations and 2) represents an important component of the evolutionary legacy of the species.

In contrast to salmon, NMFS lists steelhead under the joint NMFS-U.S. Fish and Wildlife Service (USFWS) policy for recognizing distinct population segments (DPSs) under the ESA. This policy adopts criteria similar to, but somewhat different than, those in the ESU policy for determining when a group of vertebrates constitutes a DPS. A group of organisms is discrete if it is "markedly separated from other populations of the same taxon as a consequence of physical, physiological, ecological, and behavioral factors." NMFS lists steelhead according to the status of the steelhead DPS.

The co-managers' need for the Proposed Action is to continue to maintain and operate salmon and steelhead hatchery programs using existing facilities for conservation, mitigation, and tribal and non-tribal fishing opportunity pursuant to the Puget Sound Salmon Management Plan implemented under *United States v. Washington,* and treaty rights preservation purposes while meeting ESA requirements. WDFW and the Puget Sound treaty tribes strive to protect, restore, and enhance the productivity, abundance, and diversity of Puget Sound salmon and steelhead and their ecosystems to sustain treaty ceremonial and subsistence fisheries, treaty and non-treaty commercial and recreational fisheries, non-consumptive fish benefits, and other cultural and ecological values.

Relationship between the ESA and NEPA

The relationship between the ESA and NEPA is complex, in part because both laws address environmental values related to the impacts of a Proposed Action. However, each law has a distinct purpose, and the scope of review and standards of review under each statute are different.

The purpose of an EIS under NEPA is to promote disclosure, analysis, and consideration of the broad range of environmental issues surrounding a proposed major Federal action by considering a full range of reasonable alternatives, including a No-action Alternative. Public involvement promotes this purpose. The purpose of the ESA is to conserve listed species and the ecosystems upon which they depend. Determinations about whether hatchery programs in Puget Sound meet ESA requirements are made under section 4(d) or section 7 of the ESA. Each of these ESA sections has its own substantive requirements, and the documents that reflect the analyses and decisions are different than those related to a NEPA analysis.

It is not the purpose of this EIS to suggest to the reader any conclusions relative to the ESA analysis for this action. While the NEPA Record of Decision (ROD) identifies the selected NEPA alternative, the ROD does not conclude whether that alternative complies with the ESA.

Alternatives Analyzed in Detail

Alternative 1 (No Action)

Under this alternative, NMFS would not make a determination under the 4(d) Rules for any of the five HGMPs, and WDFW would discontinue its early winter steelhead hatchery programs in the Dungeness, Nooksack, Stillaguamish, Skykomish, and Snoqualmie River basins (Table S-2). This No-action Alternative represents NMFS's best estimate of what would happen in the absence of the Proposed Action – a determination that the co-managers' submitted HGMPs meet requirements of the 4(d) Rule.

Table S-2. Annual hatchery releases of juvenile steelhead under the alternatives by river basin.

River Basin	Alternative 1 (No Action)	Alternative 2 (Proposed Action)	Alternative 3 (Reduced Production)	Alternative 4 (Native Broodstock)
Dungeness	0	10,000	5,000	10,000
Nooksack	0	150,000	75,000	150,000
Stillaguamish	0	130,000	65,000	130,000
Skykomish	0	256,000	128,000	256,000
Snoqualmie	0	74,000	37,000	74,000
Total	0	**620,000**	**310,000**	**620,000**

Source: HGMPs.

Alternative 2 (Proposed Action)

This alternative consists of hatchery operations as proposed under the co-managers' HGMPs. NMFS would make a determination that the HGMPs submitted by the co-managers meet requirements of the 4(d) Rule. The early winter steelhead hatchery programs in the Dungeness, Nooksack, Stillaguamish, Skykomish, and Snoqualmie River basins would be implemented as described in the five submitted HGMPs (Table S-2), and up to 620,000 steelhead yearlings would be released. The hatchery programs would utilize existing hatchery capacity for operations, and would be adaptively managed over time to incorporate best management practices as new information is available.

Alternative 3 (Reduced Production)

Under this alternative, WDFW would reduce the number of fish released from each of the five proposed hatchery programs by 50 percent (to 310,000 steelhead yearlings) because it represents a mid-point between the Proposed Action (Alternative 2) and the No-action Alternative (Alternative 1) (Table S-2). Revised HGMPs would be submitted reflecting these reduced production levels, and NMFS would make a determination that the revised HGMPs submitted as RMPs meet the requirements of the 4(d) Rule.

NMFS's 4(d) regulations do not provide NMFS with the authority to order changes of this magnitude as a condition of approval of the HGMPs submitted as RMPs. NMFS's 4(d) regulations require NMFS to make a determination that the HGMPs submitted as RMPs *as proposed* either meet or do not meet the standards prescribed in the rule. Nonetheless, NMFS supports analysis of this alternative to assist with a full understanding of potential effects on the human environment under various management scenarios.

Alternative 4 (Native Broodstock)

Under this alternative, WDFW would change its program management to transition the programs from the current non-native Chambers Creek stock to broodstock derived from fish native to the respective watershed in the project area (Table S-2). While this could be done in multiple ways, involving different periods of time and various objectives, for the purpose of this analysis NMFS assumes that use of Chambers Creek stock in the broodstock would be terminated immediately. Fish taken for broodstock would then only be those determined to be native to the given watershed.

Broodstock collection would be contingent upon availability of natural-origin fish, ensuring first that an appropriate number of fish would be able to spawn naturally; after that critical threshold is ensured, then a proportion of additional returns would be taken into the hatchery facilities.

NMFS's 4(d) regulations do not provide NMFS with the authority to order changes of this magnitude as a condition of approval of the HGMPs submitted as RMPs. NMFS's 4(d) regulations require NMFS to make a determination that the HGMPs submitted as RMPs *as proposed* either meet or do not meet the

standards prescribed in the rule. Nonetheless, NMFS supports analysis of this alternative to assist with a full understanding of potential effects on the human environment under various management scenarios.

A summary of distinguishing features of the alternatives is shown in Table S-3.

Summary of Resource Effects

Table S-4 provides a summary of the predicted resource effects under each of the four alternatives. The summary reflects the detailed resource discussions in Chapter 4, Environmental Consequences.

The relative magnitude and direction of impacts is described in Table S-4 using the following terms:

Undetectable:	The impact would not be detectable.
Negligible:	The impact would be at the lower levels of detection, and could be either positive or negative.
Low:	The impact would be slight, but detectable, and could be either positive or negative.
Moderate:	The impact would be readily apparent, and could be either positive or negative.
High:	The impact would be greatly positive or severely negative.

Table S-3. Summary of distinguishing features of the alternatives.

Alternative	NMFS Review, Evaluation, and Approval of Plans under 4(d) Rules	Number of Hatchery-origin Fish Released	Changes in Hatchery Programs	Conservation Benefit to Salmon and Steelhead
Alternative 1 (No Action)	No evaluation and determination under the 4(d) rules	0	Early winter steelhead programs would be terminated.	Teminating releases would eliminate any risk to listed salmon and steelhead from early winter steelhead hatchery programs.
Alternative 2 (Proposed Action)	Evaluation and determination under the 4(d) rules	620,000	Existing production levels would continue, and conservation measures would be applied to early winter steelhead hatchery programs to reduce risks and to meet conservation requirements.	Conservation requirements for listed salmon and steelhead would be met.
Alternative 3 (Reduced Production)	Same as Alternative 2	310,000	Releases of early winter steelhead hatchery programs would be reduced 50 percent.	Conservation requirements for listed salmon and steelhead would be met, and risks from early winter steelhead production would be reduced.
Alternative 4 (Native Broodstock)	Same as Alternative 2	620,000	Use of early winter steelhead broodstock would be terminated immediately; the hatchery programs would transition to broodstock derived from fish native to the watershed.	Conservation requirements for listed salmon and steelhead would be met.

Table S-4. Summary of environmental consequences for EIS alternatives for each resource.

Resource	Alternative 1 (No Action – termination)	Alternative 2[1] (Proposed Action)	Alternative 3[1] (Reduced Production)	Alternative 4[1] (Native Broodstock)
Water Quantity	Compared to existing conditions, the early winter steelhead hatchery programs would be terminated, but all of the hatchery facilities that support the programs would continue to operate to produce fish for programs that are not part of the Proposed Action. Short- and long-term water use may be less than under existing conditions because no early winter steelhead would be produced.	The hatchery programs would continue to operate at existing levels, and would have negligible to moderate negative effects on water quantity, depending on the hatchery program, compared to Alternative 1.	Same as Alternative 2, although water use would be reduced to support lower production levels of early winter steelhead.	Same as Alternative 2.
Salmon and Steelhead	Because early winter steelhead hatchery production would be terminated, negative and positive effects to salmon or steelhead from the programs would be eliminated, compared to existing conditions.	The hatchery programs would continue to operate at existing levels, and would generally have negligible to moderate negative effects on gene flow, competition and predation, hatchery facilities, masking, incidental fishing, and disease transfer effects; and negligible positive effects from nutrient cycling, depending on the hatchery program and affected species. As under existing conditions, there would be no benefit to the viability of the listed steelhead DPS.	Same as Alternative 2, except that effects from gene flow, competition and predation, hatchery facilities, masking, incidental fishing, and disease transfer from early winter steelhead would be reduced. There would be no change in viability benefit to the listed steelhead DPS compared to existing conditions.	Same as Alternative 2 except that collection of local native broodstock could have a low negative effect on the abundance and spatial structure of the natural-origin populations (i.e., mining), and a potential positive benefit to viability of the listed steelhead DPS.

Table S-4. Summary of environmental consequences for EIS alternatives for each resource. (continued)

Resource	Alternative 1 (No Action – termination)	Alternative 2[1] (Proposed Action)	Alternative 3[1] (Reduced Production)	Alternative 4[1] (Native Broodstock)
Other Fish Species	Because early winter steelhead hatchery production would be terminated, other fish species would be affected if they compete with, are prey of (positive effect), or prey on (negative effect) early winter hatchery-origin steelhead, compared to existing conditions.	The hatchery programs would continue to operate at existing levels, and would have low negative to negligible positive effects on other fish species if they compete with or are prey of (negative effect), or prey on fish from early winter steelhead hatchery programs (positive effect), compared to Alternative 1.	Same as Alternative 2, except that the food supply for fish species that benefit from steelhead as prey would be reduced, and risk to other fish species that compete with, are prey of, or prey on steelhead would be reduced, compared to Alternative 2.	Same as Alternative 2.
Wildlife – Southern Resident killer whale	Because early winter steelhead hatchery production would be terminated, early winter steelhead prey that would have been available to Southern Resident killer whales under existing conditions would be eliminated. This reduction from existing conditions would likely result in a negligible negative effect. Southern Resident killer whales would continue to occupy their existing habitats with a similar abundance, and would continue to prey on available salmon and other steelhead, especially Chinook salmon, as under existing conditions.	The hatchery programs would continue to operate at existing levels, and would have a negligible positive effect on Southern Resident killer whales, which would continue to occupy their existing habitats with a similar abundance, and would continue to prey on salmon and steelhead, especially Chinook salmon, compared to Alternative 1.	Similar to Alternative 2, except that early winter steelhead hatchery production and adult returns would decrease, reducing the supply of steelhead available to Southern Resident killer whales as prey. Alternative 3 would have a negligible positive effect, similar to Alternative 2, but less pronounced.	Same as Alternative 2.

Table S-4. Summary of environmental consequences for EIS alternatives for each resource. (continued)

Resource	Alternative 1 (No Action – termination)	Alternative 2[1] (Proposed Action)	Alternative 3[1] (Reduced Production)	Alternative 4[1] (Native Broodstock)
Socioeconomics	Because early winter steelhead hatchery production would be terminated, non-tribal and tribal fishing opportunities would be reduced and there would be a loss of person income and jobs, compared to existing conditions.	The hatchery programs would continue to operate at existing levels, and would have low to moderate positive socioeconomic effects from hatchery operations and fishing activities (non-tribal and tribal), compared to Alternative 1.	Same as Alternative 2, except that the socioeconomic effects from hatchery operations and fishing (non-tribal and tribal) would decrease.	Same as Alternative 2.
Environmental Justice	Because early winter steelhead hatchery production would be terminated, reduced fishing opportunities would negatively impact all communities of concern, and affected Native American tribes, compared to existing conditions.	The hatchery programs would continue to operate at existing levels, and would provide low positive effects from fishing opportunities for all communities of concern, and moderate positive effects for Native American tribes, compared to Alternative 1.	Same as Alternative 2, except that fishing opportunities for all communities of concern, and for Native American tribes, would decrease.	Same as Alternative 2.

[1] Potential differences between the no action and the action alternatives would be due to differences in hatchery production levels and program type under the action alternatives.

Preferred Alternative

This draft EIS does not contain a preferred alternative. NMFS will identify the preferred alternative in the final EIS after considering the comments received on this document. The preferred alternative may be one of the alternatives or a combination of components of more than one alternative, possibly varying for each hatchery program. NMFS will also identify an environmentally preferred alternative in the ROD. This alternative may or may not be the same as the preferred alternative.

How should reviewers approach this EIS?

NMFS encourages reviewers to:

1. Review the draft EIS to gain an understanding of how it is organized and how the alternatives are framed and analyzed.
2. Carefully consider the information provided in Chapter 4, Environmental Consequences, and Chapter 5, Cumulative Effects.

After considering the effects, comment on how NMFS should formulate a preferred alternative for publication in the final EIS and ROD.