Final Supplement
to the
Shared Strategy's
Puget Sound Salmon Recovery Plan

Prepared by

National Marine Fisheries Service
Northwest Region

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CONTENTS

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Under the Endangered Species Act of 1973 (ESA), the goal of a recovery plan is the conservation and survival of a threatened or endangered species. Recovery plans are prepared by the National Marine Fisheries Service (NMFS), consistent with the agency's obligations under the ESA, often with the assistance of recovery teams, contractors, state agencies, watershed councils, and others. Recovery plans are not regulatory or decision documents—that is, the recommendations in a recovery plan are not considered final decisions unless and until they are actually proposed for implementation. Objectives will be attained and funds expended contingent upon appropriations, priorities, and other budgetary constraints. Nothing in this Plan should be construed as a commitment or requirement that any Federal agency obligate or pay funds in contravention of the Anti-Deficiency Act, 31 U.S.C. 1341, or any other law or regulation. Recovery plans do not necessarily represent the views, official positions, or approval of any individuals or agencies, other than those of NMFS, and they represent the official positions of NMFS only after they have been approved by the NMFS Northwest Regional Administrator, after giving notice of a proposed Plan and opportunity for public comment. Approved recovery plans are subject to modification as dictated by new findings, changes in species status, and the completion of recovery actions.

Literature citation should read as follows:

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Recovery plans can be downloaded from THE NMFS website: http://www.nwr.noaa.gov/ESA-Salmon-Listings/Salmon-Populations/Chinook/Index.cfm

1.0 INTRODUCTION

This document is the NOAA National Marine Fisheries Service (NMFS) Final Supplement to the Puget Sound Salmon Recovery Plan prepared by the Shared Strategy for Puget Sound (the Shared Strategy Plan). Together, the NMFS Final Supplement and the Shared Strategy Plan constitute the Endangered Species Act (ESA) Recovery Plan (Recovery Plan) for the Puget Sound Chinook Salmon (*Oncorhynchus tshawytscha*) evolutionarily significant unit (ESU). This Final Supplement contains revisions and additions inspired by, or in consideration of, public comments, and it supersedes the draft Supplement.

The Shared Strategy is a collaborative initiative that coordinates recovery planning for Puget Sound salmon. The Shared Strategy Plan and NMFS Draft Supplement were offered for public comment December 27, 2005, and a Notice of Availability was published in the Federal Register (70 FR 76445) on the same date.

NMFS received 98 comment letters by mail, fax, or email on the Shared Strategy Plan and draft Supplement from a variety of sources, including the following: local, state, and Federal government entities; tribes; nonprofit organizations and interest groups; and interested individuals. Public hearings were held between February 7 and February 21 in Sequim, Lacey, Seattle, and Anacortes. All comments were transcribed. NMFS reviewed all comments received for substantive issues and new information, and we address as many of them as practicable in a Response to Comments, available at http://www.nwr.noaa.gov/Salmon-Recovery-Planning/Recovery-Domains/Puget-Sound/Index.cfm

NMFS wishes to acknowledge the high quality of the comments and the great care with which so many individuals and organizations responded to the Shared Strategy Plan and draft Supplement. Salmon are important to the people of the Pacific Northwest, and NMFS recognizes that public participation is essential to the task of protecting this precious natural resource. Most commenters offered praise and support for implementation of the Recovery Plan along with detailed and thoughtful critiques.

The Shared Strategy Plan is the product of four years of work on the part of numerous organizations and individuals throughout the Puget Sound region; as such, it is a remarkable public achievement, and NMFS intends to move forward to the long-term collaboration that will be necessary to implement it.

Many organizations and agencies offered further support to implement the Recovery Plan, including finding and securing funding, collaborating on local projects, further research and development of innovative strategies, and defining incentives for private and public landowners. NMFS welcomes these offers and commitments and looks forward to working with the organizations and individuals involved.

This Supplement contains the following components: an introduction and background for ESA recovery planning and the Shared Strategy Plan; a discussion of how the Recovery Plan satisfies ESA recovery plan requirements, including qualifications and enhancements that NMFS believes are necessary for ESA recovery; and a description of NMFS intended use of the Recovery Plan.

1.1 Endangered Species Act Recovery Planning

The Endangered Species Act of 1973 (ESA) requires NMFS to develop recovery plans for species listed under the Act. The purpose of recovery plans is to identify actions needed "for the conservation and survival" [ESA section 4(f)(1)] of threatened and endangered species to the point that they no longer need the Act's protection.

To be approved by NMFS, a recovery plan must meet certain requirements:

- ESA section 4(f)(1)(B) directs that recovery plans, to the extent practicable, incorporate:

    1. "a description of such site-specific management actions as may be necessary to achieve the plan's goal for the conservation and survival of the species;
    2. "objective, measurable criteria which, when met, would result in a determination, in accordance with the provisions of this section, that the species be removed from the list; and;
    3. "estimates of the time required and the cost to carry out those measures needed to achieve the plan's goal and to achieve intermediate steps toward that goal."

- ESA section 4(a)(1) lists factors for re-classification or de-listing that are to be addressed in recovery plans:

        A. The present or threatened destruction, modification, or curtailment of its habitat or range
        B. Over-utilization for commercial, recreational, scientific or educational purposes
        C. Disease or predation
        D. The inadequacy of existing regulatory mechanisms
        E. Other natural or manmade factors affecting its continued existence

In addition, it is important for recovery plans to provide the public and decision-makers with a clear understanding of the goals and scientifically supported strategies needed to recover a listed species (NMFS Interim Recovery Planning Guidance, October 2004).

1.2 NMFS Support for Locally Developed Plans

NMFS believes it is critically important to base ESA recovery plans for Pacific salmon on the many state, regional, Tribal, local, and private conservation efforts already underway throughout the region. Local support of recovery plans by those whose activities directly affect the listed species, and whose actions will be most affected by recovery requirements, is essential. NMFS therefore supports and participates in locally led collaborative efforts to develop recovery plans, involving local communities, state, Tribal, and Federal entities, and other stakeholders. As the lead ESA agency for Chinook salmon and Hood Canal summer chum salmon, NMFS is responsible for reviewing these locally produced recovery plans and deciding whether adoption is merited. When other entities such as the Shared Strategy for Puget Sound develop plans intended to provide for ESA recovery, NMFS writes a "supplement" summarizing the plan and

noting any necessary additions or qualifications. The supplement then becomes part of the ESA recovery plan for the ESU.

As part of its recovery planning efforts, the NMFS Northwest Region designated "recovery domains" in the Pacific Northwest. Puget Sound is one of five geographically based recovery domains for preparing recovery plans for listed salmon species. The other domains are the Willamette/Lower Columbia, Interior Columbia, Oregon Coast, and Southern/Oregon Northern California Coast. For each domain, NMFS convened a Technical Recovery Team (TRT) to develop recommendations on biological viability criteria for the ESU and its component populations, to make technical findings regarding limiting factors, to provide scientific support to local and regional recovery planning efforts, and to provide scientific evaluations of recovery plans.

The NMFS intent in establishing TRTs for each domain was to seek unique geographic and species expertise and to develop a solid scientific foundation for the recovery plans. All the TRTs used the same biological principles for developing their ESU and population viability criteria. These principles are described in a NMFS technical memorandum, *Viable Salmonid Populations and the Recovery of Evolutionarily Significant Units* (McElhany et al., 2000). Viable salmonid populations (VSP) are defined in terms of four parameters: abundance, population productivity or growth rate, population spatial structure, and life history and genetic diversity. A viable ESU is naturally self-sustaining. Each TRT made recommendations using the VSP framework and based on data availability, the unique biological characteristics of the ESUs and habitats in the domain, and the members' collective experience and expertise. Although NMFS has encouraged the TRTs to develop regionally specific approaches for evaluating viability and identifying factors limiting recovery, each TRT is working from a common scientific foundation to ensure that the recovery plans are scientifically sound and based on consistent biological principles.

In each domain, NMFS has worked with state, Tribal, local and other Federal stakeholders to develop a planning forum appropriate to the domain, which builds to the extent possible on ongoing, locally led efforts. The role of these planning forums is to use the TRT reports and other technical products to agree on recovery goals and limiting factors assessments, then develop locally appropriate and locally supported recovery actions needed to achieve recovery goals. While these forums also are working from a consistent set of assumptions regarding needed recovery plan elements, the process by which they develop those elements, and the form they take, may differ among domains.

1.3 Puget Sound Technical Recovery Team

NMFS appointed the Puget Sound Technical Recovery Team (PSTRT) to develop recommendations on biological viability criteria for the Puget Sound Chinook ESU and its component populations, to make technical findings regarding limiting factors, to provide scientific support to local and regional recovery planning efforts, and to provide scientific evaluations of recovery plans. The PSTRT includes biologists from NMFS, state, Tribal, and local organizations.

The PSTRT developed technical guidance for use by watershed groups in Puget Sound and reviewed the watershed recovery plans. The PSTRT also met with a Shared Strategy work group to specify the means of addressing the technical gaps the TRT identified in the watershed plans and the regional portion of the recovery plan (available at http://www.nwr.noaa.gov/Salmon-Recovery-Planning/ESA-Recovery-Plans/TRT-Review.cfm). The PSTRT concluded that if the actions outlined in the watershed and regional scale plans and the additional measures identified to fill technical gaps are implemented, the Puget Sound Chinook ESU is likely to make significant and positive strides toward meeting the viability criteria.

1.4 Shared Strategy Puget Sound Salmon Recovery Plan

On June 30, 2005, the Shared Strategy for Puget Sound presented its locally developed listed species recovery plan to NMFS. The Shared Strategy is a collaborative initiative that began in 1999 after NMFS listed Puget Sound Chinook salmon and Hood Canal summer chum as threatened, and USFWS listed coastal/Puget Sound bull trout as threatened.[1] Representatives of Federal, state, Tribal, and local governments, business, the agriculture and forestry industries, conservation and environmental groups, and local watershed planning groups met to shape "one strategy shared by many" for salmon recovery. A key objective defined in this process was to "(B)uild a scientifically robust, practical, cost-effective recovery plan by June 2005 that defines the strategies and actions necessary to recover naturally spawning Chinook salmon, bull trout and Hood Canal summer chum to self-sustaining and harvestable levels within the context of a prosperous economy and sustainable growth (Volume I, Chapter 1)."

The Shared Strategy Plan focuses particularly on the recovery of Puget Sound Chinook salmon, which also is the focus of this Supplement. Many of the actions identified in this Recovery Plan will also benefit Hood Canal summer chum salmon, whose geographic range is contained within a portion of the range of Puget Sound Chinook salmon, Puget Sound steelhead (unlisted), and bull trout, whose geographic range includes, but is more extensive than that of Puget Sound Chinook salmon. A draft recovery plan prepared specifically for the Hood Canal summer chum ESU was completed by the Hood Canal Coordinating Council, a regional council of governments, and delivered to NMFS and the State of Washington in November 2005, for review through a separate process. NMFS reviewed that plan and offered it for public comment in July 2006. Bull trout, listed as threatened, are under the jurisdiction of the U.S. Fish and Wildlife Service (USFWS) and are the subject of a draft recovery plan published by the USFWS in 2002. Thus, neither Hood Canal summer chum salmon nor bull trout are discussed further in this document.

Shared Strategy formed a nonprofit organization in 2002 to facilitate recovery plan development through a five-step process agreed to by more than 200 participants. NMFS and USFWS endorsed the Shared Strategy approach and participated in developing this plan; the planning process was designed to combine ESA requirements with locally driven recovery efforts and a vision for the future of the region. The idea was to coordinate and integrate recovery efforts

[1] The geographic area covered by the Plan also encompasses the entire range of the Puget Sound steelhead (*Oncorhynchus mykiss*) distinct population segment (DPS). NMFS is currently reviewing the status of this DPS under the ESA. The Puget Sound steelhead DPS is not currently listed.

throughout the region while maintaining a sound scientific basis for the Recovery Plan. The PSTRT worked with regional policy makers and community watershed groups throughout the process.

A fundamental assumption of the Recovery Plan is that local watershed efforts are the engine that will lead the Puget Sound Chinook salmon recovery, since restoration and protection actions will take place largely at the watershed level. Thus, the planning process built upon the work of groups and local governments in 14 watershed planning areas (often based on Water Resource Inventory Areas [WRIAs] previously defined by the Washington Department of Ecology), which prepared individual watershed recovery plans for their areas.

The Shared Strategy Plan is organized into two volumes. Volume I is the regional plan, which lays out overall goals and biological objectives and describes limiting factors, threats, and measures to address them at the ESU scale. Volume I, Chapter 5, also includes profiles of the watersheds that make up the Puget Sound region, with summaries of the watershed plan developed by local groups or councils. Volume II contains the entire texts of the watershed plans, which address recovery objectives, limiting factors, threats, and actions at the population or watershed scale. Volume II also includes the regional plan for managing Puget Sound nearshore areas for Chinook salmon recovery.

1.5 Federal Treaty and Trust Responsibilities

Northwest Indian tribes have legally enforceable treaty rights reserving to them a share of the harvestable salmon. Achieving the basic purposes of the ESA such that the species no longer needs the protection of the Act may not by itself fully meet these rights and expectations, although it will lead to major improvements in the current situation. Ensuring a sufficient abundance of salmon to sustain harvest can be an important element in fulfilling trust and treaty rights as well as garnering public support for these plans.

It is NMFS policy that recovery of salmonid populations must achieve two goals: (1) the recovery and delisting of salmonids listed under the provisions of the ESA, and (2) the restoration of the meaningful exercise of tribal fishing rights. “It is the agency’s view that there is no conflict between the statutory goals of the ESA and Federal trust responsibility to Indian tribes” (Letter from Terry Garcia, Assistant Secretary for Oceans and Atmosphere, to Ted Strong, Executive Director, Columbia Inter-Tribal Fish Commission, July 21, 1998). Additionally, we “will continue to join with states and tribes to develop a comprehensive approach to the restoration of fish and wildlife resources in a manner that fulfills all obligations under Federal law, including trust obligations to Indian tribes” (ibid.).

Thus, it is appropriate for recovery plans to take these considerations into account and plan for a recovery strategy that includes harvest. In some cases, the desired abundances for harvest may come about through increases in the naturally spawning population. In others, the recovery strategy may include appropriate use of hatcheries to support a portion of the harvest. So long as the overall plan is likely to achieve the biological recovery of the listed ESU, it will be acceptable as a recovery plan.

Puget Sound Chinook salmon, and all of the other listed salmonids in other ESUs, have been harvested both historically and in modern times, and there is a strong public interest in restoring them to harvestable levels. Because listed salmon often migrate with non-listed fish, the listings not only constrain the harvest of listed fish but also have become factors limiting the harvest of other non-listed fish. Fisheries affecting Puget Sound Chinook salmon are co-managed by Washington State, Puget Sound Tribes, and Federal agencies, under the principles of the Pacific Salmon Treaty (PST), the Magnuson-Stevens Act, U.S. *v*. Washington, and United States treaties with Puget Sound Tribes.

2.0 NMFS REVIEW OF THE SHARED STRATEGY PLAN

After an extensive review of the Shared Strategy Plan and subsequent public comments, NMFS has concluded that the Shared Strategy's Puget Sound Salmon Recovery Plan, with the addition of enhancements identified in this Supplement, meets ESA section 4(f) recovery plan requirements. In this section we summarize that review and conclusion.

2.1 Recovery Goal

The Shared Strategy Plan's overarching goal is to "recover self-sustaining, harvestable salmon runs in a manner that contributes to the overall health of Puget Sound and its watersheds and allows us to enjoy and use this precious resource in concert with our region's economic vitality and prosperity" (Volume I, Chapter 1). NMFS endorses this overall goal.

2.2 Recovery Strategy

The Shared Strategy Plan's overall recovery strategy, summarized in Volume 1, Chapter 5, is built upon the 14 Puget Sound watershed areas' long-term objectives for salmon recovery (e.g., co-manager targets, properly functioning habitat, etc.), their determination of what it will take over the long-term to address the key factors and threats limiting recovery in their area, and the collective watershed and regional determination on how to meet the PSTRT's ESU viability criteria. The strategy includes specific protection and restoration actions for each watershed as well as actions at the regional ESU scale that need to be implemented in the first 10 years to put the ESU on a recovery trajectory toward achieving the long-term objectives.

The strategy can be summarized as follows:

a) Act immediately to protect functioning habitat and habitat-forming processes through a combination of regulatory, voluntary, and incentive-based tools.

b) Prioritize, sequence, and implement habitat restoration actions according to the key factors and threats limiting recovery in each watershed and the Puget Sound nearshore and marine waters and estuaries.

c) Implement the Puget Sound Harvest and Hatchery Resource Management Plans and Hatchery Genetic and Management Plans to ensure harvest and hatchery programs work in concert with recovery objectives.

d) Address the three H-factors (habitat, harvest, and hatchery) in concert to sequence and synchronize activities between them to achieve recovery goals over time.

e) Sustain existing and create new collaborative partnerships among stakeholder groups (e.g., farmers, foresters, environmentalists, all levels of government, etc.) at local and regional scales to resolve implementation issues.

f) Address uncertainties through a robust regional adaptive management and monitoring program that is closely coordinated with local watershed, co-manager, state, and tribal adaptive management and monitoring programs.

NMFS supports the Shared Strategy Plan's overall recovery strategy. In this section we further emphasize, reinforce, or augment particular elements of it to ensure that uncertainties are reduced to the maximum extent possible at this time. The overall strategy and the inclusion of the important elements listed below are the basis for NMFS conclusion that the Recovery Plan has a solid foundation upon which to achieve goals for the conservation and survival of the species. Elements of the strategy are discussed here under the three H-factors (habitat, harvest and hatcheries), adaptive management, all-H integration, and general comments.

2.2.1 *Habitat*

NMFS agrees with the Shared Strategy Plan that protecting functioning habitat is one of the top priorities and first steps for achieving a viable ESU. Human population growth in the region, projected to increase by 1.4 million in the next 15 years, will create development pressure in areas currently providing good habitat function. The Shared Strategy Plan describes the importance of protecting existing physical habitat and habitat-forming processes in Puget Sound (Volume I, Chapter 6 and the individual watershed plans in Volume II). The proposed strategies and actions for habitat protection presented in the Plan, if implemented, would increase the likelihood of recovery of the ESU.

NMFS agrees with the statement in Volume I of the Plan that "Today's remaining Chinook populations depend on existing quality and quantity of salmon habitat in the Sound's fresh and marine waters. Any further reductions in habitat quality and quantity will require more restoration to achieve recovery goals ….Protection is needed at the individual habitat site as well as at the ecosystem scale to ensure the processes that create habitat continue to function" (Vol.1, Chapter 6, p.351).

NMFS supports the habitat protection programs and actions described in Volume I, Chapter 6 of the Shared Strategy Plan and the multiple site-specific protection strategies included in the watershed chapters in Volume II. NMFS understands that the Shared Strategy currently is coordinating a pilot project in San Juan County to evaluate the effectiveness of existing salmon habitat protection programs and identify where improvements need to be made.

NMFS strongly supports the San Juan County and Puget Sound Salmon Recovery Council efforts[2] and encourages all parties responsible for Recovery Plan implementation to act immediately to protect remaining functional habitat for salmon in Puget Sound. NMFS recognizes there are a variety of tools available for habitat protection and that a combination of all approaches, including incentives and enhanced regulatory programs likely will be needed to achieve the level of habitat protection required to support salmon recovery in Puget Sound.

Land Use Protection Programs. One of the important opportunities to protect existing habitat and habitat-forming processes discussed in the Shared Strategy Plan is through updating and adopting Federal, state, and local land use protection programs, as well as more effectively combining regulatory, voluntary, and incentive-based protection programs. NMFS believes that there is significant uncertainty regarding the ability of current programs to address the Factor A threats ("The present or threatened destruction, modification, or curtailment of a species' habitat or range") identified in Section 2.3.1.2 of this Supplement and to produce the results necessary to achieve recovery of the ESU. We support using the Recovery Plan as a guide to address Factor A threats and using the habitat limiting factors analyses provided in the individual watershed chapters to update local, state, and Federal ordinances and programs. Similarly, NMFS believes the Federal government plays a necessary role in achieving ESU recovery by implementing its various related regulatory programs—ESA, Clean Water Act, Northwest Forest Plan, Rivers and Harbors Act, Federal Power Act, and others that may apply—in concert with the Recovery Plan's goals.

Chapter 6 of the Shared Strategy Plan describes freshwater, nearshore, and estuarine habitat protection strategies and actions that are necessary to implement in the next 10 years in order to support recovery of the Puget Sound Chinook ESU. NMFS concurs with the need to implement all the strategies and actions within the 10-year timeframe. NMFS believes the State Growth Management and Shoreline Management Acts together provide an important regulatory framework for ensuring that freshwater, nearshore, and marine habitat are managed in a manner that supports salmon recovery. Further, NMFS agrees that salmon habitat protection at the state and local level can and should be enhanced as local Critical Area Ordinances, Shoreline Master Programs, and development regulations are updated. NMFS expects state and local governments will use the best scientific information available as they amend their management programs and land use regulations to ensure that salmon habitat is protected, consistent with the Recovery Plan's strategies and actions.

Nearshore and Marine. Actions recommended in the nearshore chapter (Volume II: Regional Nearshore and Marine Aspects of Salmon Recovery in Puget Sound) in combination with the regional nearshore strategy presented in Volume I, Chapter 6, if implemented, would likely result in a major improvement in survival of Puget Sound Chinook Salmon. NMFS agrees with the basic premises of the Shared Strategy Plan that the certainty of achieving significant improvements could be increased by paying particular attention to the specific natal and pocket estuaries and sites with subbasin stressors identified in Appendix E of the nearshore chapter. NMFS also supports the emphasis on nearshore and shoreline habitat protection measures for all

[2] The Puget Sound Salmon Recovery Council is the Shared Strategy's regional leadership body, with representatives from each watershed area, Tribal, state and Federal governments, business, and conservation communities, that sets policy direction for implementation of the Puget Sound Salmon Recovery Plan.

watersheds, including the four watershed areas that do not have independent spawning populations but are used by Chinook salmon from multiple river basins, i.e. San Juan Islands, Island County, East Kitsap, and South Sound.

The authors of the nearshore chapter (in Volume II of the Shared Strategy Plan) acknowledge the importance of the nearshore environment for Chinook recovery and believe additional research and monitoring is needed on various aspects of the relationship between nearshore habitat and salmon. NMFS concurs. NMFS expects Plan implementers at the watershed, state and Federal level to incorporate new information from ongoing research in the nearshore environment into their implementation plans as it becomes available, and to modify implementation actions as appropriate to optimize benefits to salmon.

Lower Elevation Mainstems, Floodplains, and Estuaries. NMFS strongly supports the strategies and actions identified in the Shared Strategy Plan that protect, preserve options for, and restore habitat functions in lower river areas. Deltas, estuaries, side-channels, and floodplains are important as rearing and migratory habitat for Chinook salmon and, as such, are important for recovery. In many watersheds, the lower river areas are also among the most altered environments used by Chinook salmon in Puget Sound. We respect the local decision processes that were used to arrive at the set of actions in each watershed, and believe that the certainty of achieving ESU viability would be improved by continued collaborative problem-solving and establishment of clear measures to monitor effectiveness and adaptively manage during the implementation phase to more fully develop or add actions to provide functional habitat in the lower river areas.

Instream Flows. Insufficient flows for fish are a key factor limiting recovery in many watersheds. NMFS supports the Shared Strategy Plan's proposal for instream flow protection and enhancement (Volume I, Chapter 6). The Shared Strategy Plan sets out a strategy to establish protective instream flows, advance instream flow science, and implement flow programs over the next 10 years. NMFS expects that instream flows will be implemented where already established and deemed necessary for a particular watershed while additional elements of the instream flow strategy for the ESU are being developed and applied.

As described in the Instream Flow Tool Kit (American Rivers and WEC, 2003), there is a long history of state-led efforts for evaluating and setting instream flows in various watersheds in Puget Sound. While there has been incremental progress in some watersheds, the Washington State Governor's Salmon Office summarized the currently poor conditions to which salmon are exposed. The 2004 State of Salmon Watersheds Report lists the Nooksack, Snohomish, Lake Washington, Green, White, Puyallup, Dungeness and Elwha as "water-critical basins" that are over-appropriated. The Stillaguamish and lower Skagit watersheds are listed as "low flow," experiencing significant pressure for increased water use and rapidly declining flows for fish. Of all the Puget Sound Chinook natal watersheds, only the mid-Hood Canal and upper Skagit were not listed with flow problems for salmon. As we stated in the 2005 Supplement to the Draft Puget Sound Salmon Recovery Plan: "NMFS believes that a necessary component in addition to the regional strategy on instream flow protection is that the Washington Department of Ecology establish site-specific instream flow protection programs and/or regulations to support salmon recovery."

Given the certainty of increasing demand on Puget Sound water supplies, NMFS believes there is an urgent and inescapable need to ensure sufficient instream flows to recover Puget Sound Chinook salmon. The public comments on this issue highlight the urgency of putting in place effective measures to protect and enhance flows throughout the ESU. Water quantity management and regulation in Washington is carried out under the laws of the state as administered by the Department of Ecology. NMFS strongly encourages the Department of Ecology to act swiftly to protect instream flows and to work with Puget Sound Tribes, local governments, and other interested parties to implement water conservation and flow restoration programs. The probability of salmon recovery being successful in Puget Sound will be substantially increased if an effective instream flow management program is implemented as soon as possible.

Forest Lands. The Federal lands are managed according to the Northwest Forest Plan's Aquatic Conservation Strategy (ACS). The ACS has four key elements: riparian reserves, key watersheds, watershed analysis, and watershed restoration. Together these provide comprehensive long-term protection of aquatic habitat. Furthermore, as with all Federal actions, ongoing forest operations on National Forests will be reviewed by NMFS under section 7(a)(2) of the ESA as each National Forest proposes actions that may affect ESA-listed salmon. Forest operations on state forest lands and certain private forest lands covered by an existing Habitat Conservation Plan (HCP) have already been programmatically reviewed and approved by NMFS with ongoing monitoring. In addition, the recently approved Forest Practice Rules Habitat Conservation Plan (FPHCP, signed June 5, 2006) includes an extensive record that describes how implementing those conservation measures provides a high likelihood of contributing to recovery of watershed processes that support salmon and trout statewide. In the context of the Recovery Plan, it is significant that several hundred thousand acres of privately managed timberlands in Puget Sound will be managed according to the FPHCP. Over time, watershed processes related to riparian function, sediment delivery, and channel condition are expected to measurably improve. Improving conditions in forested watersheds will likely contribute to salmon recovery.

During public review of the Shared Strategy Plan, NMFS received several comments asking how NMFS would address the potential for adverse effects on salmon habitat from commercial forestry activities conducted on lands regulated by Washington State under the "20-acre exemption." NMFS added a specific condition to the ESA §10(a)(2)(B) permit to address this issue [http://www.nwr.noaa.gov/Salmon-Habitat/Habitat-Conservation-Plans/Washington-Forest-Practices/Index.cfm]. NMFS believes that by adding this condition to the permit, the potential for adverse effects is satisfactorily minimized.

Agricultural Lands. NMFS recognizes that farmers have a range of abilities and opportunities to manage their farm lands in ways that conserve salmon habitat. As described in several watershed plans, substantial improvements in riparian and water management are necessary in many situations to provide functional habitats for salmon. NMFS expects that proposed restorative actions on such lands will be consistent with local biological assessments and mirror the priorities described in watershed recovery plans. Farm management plans should address salmon habitat when considering whether or how to enhance riparian vegetation and stream

channel health; treat erosion sites along streams and rivers; ensuring that all watercourses accessible to fish are maintained in a way that avoids exposure of salmon to maintenance actions; properly screening all water diversions; and using biocides and fertilizers consistent with the most recent safeguards identified by NMFS.

2.2.2 *Harvest*

The Shared Strategy Plan relies on the harvest Resource Management Plan (RMP) developed by the co-managers and approved by NMFS in 2005. Most of the individual watershed plans included in Volume II also incorporate the RMP by reference. Management of fisheries as described is intended to contribute to integrated, comprehensive protection and restoration of at-risk Chinook salmon populations and provide surplus fish for harvest, while minimizing the likelihood for harm to natural-origin fish populations. The RMP provides details regarding harvest actions to help recover Chinook salmon populations, including recent program modifications and measures applied to reduce the risk of harm to wild Chinook salmon while providing treaty tribal and non-tribal harvest opportunity on stronger salmon stocks (hatchery Chinook and non-listed salmon species). Some watershed chapters in Volume II also identify possible future harvest actions, more detail regarding specific fishery actions, and new programs that may benefit listed fish.

The current RMP will expire in April 2010. However, NMFS expects that the co-managers will continue to implement the harvest actions and objectives in the RMP unless revised through adoption of a new harvest plan after 2010 or through an adaptive management framework developed through recovery planning. NMFS will work with the Puget Sound Treaty Tribes and the Washington Department of Fish and Wildlife within the ESA, NEPA, U.S. *v.* Washington, Shared Strategy forums, and the public to evaluate the specific plans proposed within each watershed prior to formal decisions.

NMFS believes the following clarifications will increase the certainty that the actions implemented through the watershed plans will be effective in recovering the Puget Sound ESU.

- Volume I of the recovery plan describes the various harvest forums and the structure of the harvest management planning process. However, the strategies in watershed plans in Volume II do not make it clear that harvest management is a government-to-government process among Tribal, state, and Federal managers. Fisheries affecting Puget Sound Chinook salmon are implemented under the principles of the Pacific Salmon Treaty, the Magnuson-Stevens Act and U.S. *v.* Washington. Fishery management will continue to fall under the purview of the laws governing each of the harvest management forums. Technical or policy forums created for the Recovery Plan and considering harvest issues must work with the parties in these existing harvest management forums to ensure that harvest planning activities are coordinated.
- The Shared Strategy Plan identifies a need to reduce impacts of Canadian fisheries on some Puget Sound Chinook salmon populations. NMFS will be taking these needs into consideration in future Pacific Salmon Treaty negotiations. The Shared Strategy Plan relies upon the 2004-2009 Puget Sound Chinook Harvest RMP conclusion that southern U.S. exploitation rates that do not exceed the Critical Exploitation Rate Ceilings (CERC) will not impede recovery. If further improvements in survival become necessary, NMFS

will first seek to obtain such improvements through negotiated adjustments under the PST. If monitoring and evaluation indicate that further survival improvements are necessary, NMFS will review all Hs for potential improvements to achieve recovery of the Puget Sound Chinook ESU.

- Six of the Chinook management units used in Puget Sound harvest management contain multiple populations (Nooksack early, Skagit summer/fall, Skagit spring, Snohomish, Stillaguamish, and Lake Washington). Most are managed for survival and rebuilding of the weakest component population, and NMFS has concluded that the current RMP will not appreciably reduce the likelihood of survival and recovery of the Puget Sound Chinook ESU. However, NMFS will continue to assess recovery and survival of the ESU based on the progress of individual populations across the ESU relative to their role in recovery and recognizing that not all populations must be at low risk of extinction in order to achieve viability for the ESU as a whole. Further assessment may indicate that there are populations within individual management units that are not currently the primary focus of harvest management that require additional protection for the recovery of the ESU. This may require revisions to the current harvest objectives to afford that protection. NMFS encourages the design and implementation of population-based monitoring and adaptive management programs that will allow such revisions in objectives if necessary.
- NMFS will work with co-managers to improve and expand application of quantitative, biologically-based methods for deriving harvest objectives for Puget Sound Chinook populations. These methods will incorporate quantifiable effects of harvest on survival and recovery of the ESU thereby providing valuable tools that can be used to assess harvest impacts (Volume I, Chapter 6). As this work is completed and more information becomes available, it should increase the certainty that harvest will not impede rebuilding of the ESU.

2.2.3 *Hatcheries*

NMFS agrees with the approach to artificial propagation described in Volume I, Chapter 6 of the Shared Strategy Plan. Operation of the hatchery programs as described should appropriately support integrated, comprehensive protection and restoration of at-risk Chinook salmon populations and provide surplus fish for harvest, while minimizing the likelihood of harm to natural-origin fish populations. The individual watershed plans included in Volume II incorporate the majority of Puget Sound hatchery operation proposals described in Hatchery and Genetic Management Plans (HGMPs) and RMPs assembled by the co-managers and currently under review by NMFS for evaluation and determination under the ESA. The HGMPs and RMPs provide specific details regarding hatchery actions implemented to help recover Chinook salmon populations, including recent program modifications and measures applied to reduce the risk of harm to wild Chinook salmon while meeting hatchery fish production objectives. Volume II also identifies recent program changes, proposals for additional hatchery program modifications, and new programs that may benefit listed fish.

As indicated, NMFS has assembled HGMPs for all salmon hatcheries in Puget Sound and currently is in the process of reviewing those plans and preparing the appropriate NEPA and

ESA documents. NMFS will work with the Puget Sound Treaty Tribes and the Washington Department of Fish and Wildlife within the ESA, NEPA, U.S. *v* Washington, and Shared Strategy forums to evaluate the specific plans proposed within each watershed prior to formal decisions. NMFS believes the Shared Strategy Plan's reliance on the HGMPs is appropriate and that when the NEPA and ESA processes are complete, the HGMPS will be implemented in a manner that supports achievement of the recovery objectives.

NMFS believes the following clarifications will increase the certainty that the actions implemented through the watershed plans will be effective in recovering the Puget Sound ESU.

- The "Regional Hatchery Management Strategies" sub-section in Volume I, Chapter 6 of the Shared Strategy Plan does not discuss and reference the non-Chinook Hatchery Resource Management Plan (PSTT and WDFW 2004), and the 74 HGMPs for co-manager coho, fall chum, pink, and sockeye salmon, and steelhead programs included under the RMP. These programs comprise the majority of hatchery actions in the Puget Sound region. How these non-Chinook salmon hatchery plans proposed for implementation in the region will affect threatened salmon, and prospects for their recovery, must be considered during Plan implementation. NMFS believes that monitoring and evaluation of ecological effects and effects on Chinook salmon VSP parameters associated with the hatchery production of these other salmon species is critical for gauging progress toward individual population and ESU recovery. To describe and address effects on Chinook recovery of non-Chinook hatchery strategies and actions, NFMS expects the Recovery Plan will be implemented to defer to and rely upon the non-Chinook Hatchery Resource Management Plan and the individual non-Chinook HGMPs proposed by the co-managers for implementation through the ESA review process.

- There is a programmatic need to consider the cumulative effects of all hatchery production included in the Recovery Plan on the survival and productivity of Chinook salmon in Puget Sound nearshore and marine areas, and its cumulative effects on (and limits posed by) the carrying capacity of the Puget Sound estuary.

- The Shared Strategy Plan includes a good general description of the need for, and intent to, change or adjust hatchery programs as habitat improves. NMFS strongly supports PSTRT findings restated in the Shared Strategy Plan regarding integration criteria and the need for more specificity for hatchery programs in each watershed to function in a manner that is integrated with habitat capacity and harvest objectives.

2.2.4 *Adaptive Management and Monitoring*

Volume I, Chapter 7 deals with adaptive management, monitoring, and implementation over the next 10 years and for the future. The Shared Strategy Plan provides specific actions needed to address all threats and identifies the parties with the authority, jurisdiction, or resources needed to implement each action. In some instances, the Shared Strategy Plan deferred some management issues to the adaptive management process for resolution (Volume I, Chapters 5 and 7). The Shared Strategy Plan acknowledges the importance of these elements and the commitment to complete them. NMFS supports this commitment and, because of their

importance and the time it will take to put programs that meet NMFS adaptive management and monitoring standards in place, the goal to complete them by December 2006. Rigorous monitoring and adaptive management frameworks are essential to have in place early in Plan implementation, in order to ensure that the appropriate types and amounts of data are collected to assess the effectiveness of recovery actions and the progress towards recovery. NMFS will work with local watershed planning groups and the regional adaptive management steering committee to support development and implementation of the adaptive management and monitoring program.

NMFS continues to develop guidance for applying adaptive management to recovery plan implementation, and will make this available as soon as it is ready. The NMFS framework for adaptive management is based on a decision structure that identifies the questions that need to be asked to structure a recovery plan's monitoring and evaluation program. The decision structure builds upon (a) the ESU and population viability principles described in McElhany et al.(2000) and associated indicators proposed by the TRTs, and (b) the identified threats limiting populations and ESU viability as defined by the five statutory listing factors in section 4(a)(1) of the ESA. NMFS has provided its framework to the Shared Strategy Adaptive Management workgroup and will continue to provide technical and staff support to integrate the framework into the management structure ultimately implemented for Puget Sound.

Shared Strategy provided NMFS a report on its progress in developing a regional adaptive management plan. This report is included as an Appendix to this Supplement.

The adaptive management and monitoring plan under development will integrate watershed, regional, and state scales. Most of the metrics called for in the plan will be reported by the watersheds and summarized at a regional scale. There will also be a decision-making link between the watershed groups and a regional decision-making body.

2.2.5 *All-H Integration*

NMFS has reviewed the Shared Strategy Plan with regard to integration of the H-factors and strongly supports the development of an integrated salmon recovery strategy in accordance with guidance provided by the PSTRT on addressing and considering cross-H issues in a watershed and region, using modeling and other tools as described in the Shared Strategy Plan (Volume 1, Chapter 6). The PSTRT noted that the watersheds in Puget Sound are at varying stages in developing an integrated approach, and all have more to do during implementation or through adaptive management to make progress on H-integration. In a few cases, the co-managers operating harvest and hatchery programs were not involved in the assembly of watershed plans or submitted separate plans. NMFS expects harvest, hatchery, hydro, and habitat managers to work at integrating the Hs and will assist this process through government-to-government meetings with Tribes as necessary.

Substantial progress has been made toward integration of the Hs since the Shared Strategy Plan was provided to NMFS in 2005. That progress is summarized here and a more detailed report is provided in Appendix A of this Supplement. An H-Integration work group (H-I work group) and the All-H Leadership Group (both arms of the Puget Sound Salmon Recovery Council)

developed a six-step process for integrating complementary suites of actions among the H-sectors. The six step approach integrates both technical and policy considerations to ensure integration is based on the best scientific information and is practical and feasible. The H-I workgroup has adopted a schedule for all watersheds in Puget Sound to identify H-integration needs and develop initial H-integration plans by the end of 2006. Watersheds across Puget Sound will use the six-step process created by the H-I workgroup to guide integration of their actions at the watershed scale and will complete and begin implementing final H integration plans by fall 2007.

2.2.6 *General Comments on Recovery Strategy*

NMFS has the following general comments about the Shared Strategy Plan and its implementation over time:

- The performance indicators in the watershed plans in Volume II of the Shared Strategy Plan should be reviewed and revised as appropriate to ensure they are accurate and relevant indicators of the performance of the management objectives, actions, and strategies.

- Technical models are important implementation tools for effective harvest, hatchery, and habitat management. Monitoring plans within the Puget Sound Chinook recovery plan should include evaluation of technical management models in order to increase the certainty that annual management regimes will meet their resource management and conservation objectives. Where more direct measures of mortality for individual populations or management units are available, e.g., coded-wire tags, they should be used to assess impacts on listed species. The available tools and methods should be evaluated to determine which is the most accurate to use for each population or management unit to estimate impacts on listed species. Where currently unavailable, modeling tools should be developed to improve assessment of effects of management actions on salmon and salmon habitat.

- Implementation of the Recovery Plan is designed to ultimately achieve goals for the four VSP criteria of abundance, productivity, diversity, and spatial structure. The PSTRT described diversity and spatial structure criteria in a general sense, and NMFS expects that management objectives for diversity and spatial structure will be developed over the next several years as part of recovery plan implementation.

- Monitoring and evaluation may indicate further improvements in survival are necessary for recovery, beyond those provided by the actions in the recovery plan. In that case, NMFS will review all sectors for potential improvements to achieve recovery of the Puget Sound Chinook ESU. The viability ranges developed by the PSTRT, including the co-manager recovery targets, will be used in the assessment of ESU recovery. Such an assessment will evaluate contributions from all Hs to provide necessary survival improvements. NMFS will use its authorities as appropriate throughout plan implementation to achieve recovery of the Puget Sound Chinook ESU.

2.3 ESA section 4(f)(1)(B) Requirements

This section contains a discussion and summary of how the Recovery Plan meets the three section 4(f)(1)(B) requirements.

2.3.1 *Objective, Measurable Criteria for Delisting*

Evaluating a species for potential delisting requires an explicit analysis of population or demographic parameters (the biological recovery criteria) and also of threats under the five ESA listing factors in ESA section 4(a)(1) (threats criteria). Together these make up the "objective, measurable criteria" required under section 4(f)(1)(B).

These criteria represent the best scientific analysis incorporating the most current understanding of the ESU and its populations. As the recovery plan is implemented, additional information will become available that can increase certainty about whether the threats have been abated, whether improvements in population and ESU status have occurred, and whether linkages between threats and changes in salmon status are understood. These recovery criteria will be assessed through the adaptive management program under development for the Recovery Plan, and there will be a thorough review of the criteria at the five and 10-year status reviews of the ESU. NMFS will apply the Recovery Plan's criteria when it makes a decision whether to delist the ESU.

2.3.1.1 Biological Recovery Criteria

The Shared Strategy Plan adopts the viability criteria recommended by the PSTRT for both the population and ESU levels (Volume I, Chapter 4). Also, many of the individual watershed plans set recovery goals based on the state and Tribal fisheries co-managers' population-level planning targets, which fall within the planning ranges for viability described by the PSTRT.

ESU Level Criteria. The PSTRT defined five biogeographical regions of Puget Sound in terms of physical and habitat features, including topography and ecological variations, where groups of Chinook salmon have evolved in common, and identified 22 independent populations within these regions that make up the ESU. The Plan identifies long-term objectives for each of the 22 extant populations in the ESU.

The watershed recovery planning groups and the regional planning body (Shared Strategy) designed their strategies and site-specific actions to achieve the biological viability criteria recommended by the PSTRT for the Puget Sound Chinook salmon ESU. These criteria are summarized as follows:

1. The viability status of all populations in the ESU is improved from current conditions. The final ESU-wide scenario for delisting will likely include populations with a range of risk levels, but when considered in the aggregate, the risks must be sufficiently low to assure persistence of the ESU.

2. Two to four Chinook salmon populations in each of five biogeographical regions within the ESU achieve viability, depending on the historical biological characteristics and acceptable risk levels for populations within each region. (See Supplement Table 1 for specific populations.)

3. At least one population from each major genetic and life history group historically present within each of the five biogeographical regions is viable.

4. Tributaries to Puget Sound not identified as primary freshwater habitat for any of the 22 identified populations are functioning in a manner that is sufficient to support an ESU-wide recovery scenario.

5. Production of Chinook salmon from tributaries to Puget Sound not identified as primary freshwater habitat for any of the 22 identified populations occurs in a manner consistent with ESU recovery.

6. Populations that do not meet the viability criteria for all VSP parameters (i.e., abundance, productivity, spatial structure and diversity) are sustained to provide ecological functions and preserve options for ESU recovery.

The ESU viability criteria describe the PSTRT recommendations for a recovered state of the ESU (Ruckelshaus et al., 2002). Together, these six criteria describe the habitat conditions and status of Chinook salmon that would result in a naturally self-sustaining ESU with a high likelihood of persistence. Criteria 1, 2, 3, and 6 describe the conditions of extant populations and their primary freshwater areas within the ESU that are consistent with recovery. Criteria 4 and 5 describe the roles that habitat conditions and Chinook juveniles and adults occurring in secondary habitats play in ESU viability.

The PSTRT determined that all 22 populations of Chinook salmon currently are at high risk. 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. Accordingly, most watershed planners in areas with independent populations of Chinook chose to work toward low risk status for their populations to get on a recovery trajectory during the next 10 years and as a precautionary approach to eventually recover the entire ESU.

Supplement Table 1 shows the 22 extant populations in each biogeographical region and relates them to the PSTRT's ESU viability criteria. As stated in Criterion 1, all 22 populations must improve from current conditions. Additionally, some populations have been identified as needing to achieve low risk status over time to meet the PSTRT's viability criteria.

Since it published its draft Supplement to the Plan in 2005, NMFS received additional scientific documentation indicating the information in Table 1 of the 2005 Supplement needed to be amended. That documentation is included as an Appendix to this Supplement. Based on this additional scientific information, NMFS revised Table 1 to indicate population run timing more accurately and identify those populations that need to achieve low risk for the ESU to be viable.

Final Supplement Table 1. Puget Sound Chinook Populations and Risk Status for ESU Viability

	Chinook Populations	Need to be at Low Risk For ESU viability
Strait of Georgia	North Fork Nooksack South Fork Nooksack	North Fork Nooksack South Fork Nooksack
Strait of Juan de Fuca	Elwha Dungeness	Elwha Dungeness
Hood Canal	Skokomish Mid-Hood Canal	Skokomish Mid-Hood Canal
Whidbey Basin	Skykomish (late) Snoqualmie (late) NF Stillaguamish (early) SF Stillaguamish (moderately early) Upper Skagit (moderately early) Lower Skagit (late) Upper Sauk (early) Lower Sauk (moderately early) Suiattle (very early) Cascade (moderately early)	Suiattle (very early) and 1 each of the early, moderately early, and late forms
Central/South Sound	Samammish (late) Cedar (late) Green/Duwamish (late) Puyallup (late) White (early) Nisqually (late)	White (early) and Nisqually or 1 of the other late forms[3]

In two of the five biogeographical regions (the Strait of Juan de Fuca region and the Strait of Georgia region), the PSTRT review concluded that there is relatively low certainty of meeting ESU criteria because all remaining populations need to achieve low risk, and they all currently are at very low abundance. However, in its review of the watershed plans, the PSTRT concluded that although inherent uncertainty in these regions is high, watershed groups in these two regions identified scientifically sound strategies and actions to redress the high risk status of their populations. If all the strategies identified in the Recovery Plan are implemented, including adaptive management measures, NMFS believes the uncertainties described for these two regions would likely be reduced.

In the Hood Canal biogeographical region, it is so far not possible to determine how likely it is that the Skokomish population will achieve a low risk status, since there is not yet a detailed set of recommendations for the Skokomish watershed (see more detailed discussion in Section 2.3.2.1 of this Supplement). This is a gap in the Shared Strategy Plan that is essential to fill in the near term. NMFS understands that state and Tribal co-managers, with support and involvement

[3] See following discussion.

from the U.S. Fish and Wildlife Service and Olympic National Park, are currently in the process of writing a local plan for the Skokomish River basin, which they expect to finish in 2007. When a plan is available, NMFS will evaluate it and will be able to make a more definitive determination about the likelihood of that population meeting the viability criteria. We will also update the Recovery Plan accordingly.

The PSTRT review concluded that the remaining two geographic regions (the Whidbey Basin region, containing 10 extant populations, and the Central/South Sound region, containing six extant populations) have relatively higher certainty of achieving ESU viability criteria because there are more extant populations at relatively lower risk status in these two regions. As stated in the Shared Strategy Plan (Volume I, Chapter 5), there are gaps in local watershed plans in these regions that, if filled, would increase the likelihood of achieving at least two low risk populations in each of these regions. The Shared Strategy Plan states the expectation that after the first 10 years of implementation, it will be possible to identify with more certainty which of these populations have the best chance of achieving low risk status.

Table 1 indicates that in the Central/South Puget Sound biogeographical region, the early-timed White River population as well as the Nisqually or another late-timed population will need to achieve low risk status to meet the ESU viability criteria. The PSTRT noted that the Nisqually watershed is in comparatively good condition, and thus the certainty that the population could be recovered is among the highest in the Central/South biogeographical region. NMFS concludes that protecting the existing habitat and working toward a viable population in the Nisqually watershed would help to buffer the entire biogeographical region against further risk. If additional habitat and population improvements in this biogeographical region occur, there may be opportunities for other late-timed populations to achieve low risk as well. Based on current habitat and population status in the Central/South Sound biogeographical region, however, NMFS concludes that the Nisqually population is among those that would need to achieve low risk under any recovery scenario selected for Puget Sound Chinook salmon.

The Shared Strategy Plan proposes additional measures to address the uncertainties identified for the other regions in the May 2005 technical and policy review (Volume I, Chapter 5). NMFS believes these measures plus the additions identified by NMFS in this Supplement, if implemented, would resolve many of the remaining uncertainties that are possible at this stage to address.

Population-Level Viability Criteria. The PSTRT expressed population-level viability criteria in terms of the four VSP parameters: abundance, productivity, spatial structure and diversity. The PSTRT used historical information and technical models to recommend planning ranges for abundance and productivity that describe viability characteristics for each of the 22 independent Chinook salmon populations in Puget Sound (Ruckelshaus et al., 2002). The PSTRT also described spatial structure and diversity characteristics of low risk populations. The VSP criteria and the rationale supporting each are available at http://www.nwfsc.noaa.gov/trt/puget/trtpopesu.pdf

The PSTRT integrated the results from three different types of analysis to develop the planning ranges. The PSTRT presented its results as a range because of inherent variation in salmon

populations, uncertainty in historical information, and differences among the analyses and models.

State and tribal fisheries co-managers concurrently developed a set of recovery targets for the abundance and productivity of individual Chinook salmon populations to ensure that population viability was considered in evaluating harvest, hatchery, and habitat measures. These targets are based on estimates of what salmon abundance can be supported by healthy salmon habitat at low productivity and high productivity.

The Shared Strategy approach relied on the work of 14 individual watershed planning areas to set goals for their Chinook salmon populations. The PSTRT reviewed the watershed plans in 2004 and 2005. The individual watershed goals are summarized in Volume I, Chapter 5 of the Plan, and detailed in the individual plans in Volume II.

The Plan states that achieving recovery could take many decades. Because of the complexity and extent of the changes necessary to reach the recovery targets and the technical and policy uncertainties associated with the long term, policymakers chose to focus on developing a 10-year work plan within the context of the overall recovery need. Since the existing 22 independent Puget Sound Chinook salmon populations are currently at a high risk of extinction to varying degrees, the short-term goal is to improve conditions for all the populations and to get on a trajectory toward recovery early in implementation. Additional goals in this timeframe include implementing and evaluating the set of short-term strategies and priority actions identified; gaining a preliminary view of the status and trends of important recovery indicators; and making mid-course corrections as needed. In 10 years, watershed and regional leaders will put forward the next set of strategies and actions toward achieving the long-term goal. The long-term goal (Section 3.3) is tied to achieving viable salmonid populations, i.e. to achieving self-sustaining populations of Puget Sound Chinook salmon in terms of abundance, productivity, spatial distribution, and diversity.

Supplement Table 2 shows recent-year spawner abundances for Puget Sound Chinook salmon populations against PSTRT planning ranges for viability and the state and Tribal fisheries co-managers' planning targets. The numbers provide a snapshot of the current population abundances contrasted against abundances at which the PSTRT and co-managers believe the populations would be viable.

Most watershed areas adopted the co-managers' planning targets as their long-term measurable recovery goals and some include measurable habitat goals (Volume II, watershed plans). NMFS supports the co-manager planning targets and recognizes that in all cases, the targets fall within the viability ranges identified by the PSTRT. The TRT planning ranges for viability use a set of decision rules to combine information from the co-manager analyses and two other TRT analyses; thus, by definition, the TRT viability criteria include the co-manager results. The watersheds' goals appear to focus more on abundance and productivity because they are numerical; however, the watersheds also provided narrative statements concerning their spatial structure and diversity goals.

Table 2. Chinook Spawner Abundance Planning Targets & Ranges for Puget Sound Region. (The numbers are presented for the populations for which analysis was available.)

Populations	Mean spawner abundance for 1996 -2000	Low Productivity Planning Range for Abundance	Low Productivity[1] Planning Target for Abundance (productivity in parentheses)	High productivity[2] Planning Target for Abundance (productivity in parentheses)
NF Nooksack	120	16,000 – 26,000 (1.0)	16,000 (1.0)	3,800 (3.4)
SF Nooksack	200	9,100 – 13,000 (1.0)	9,100 (1.0)	2,000 (3.6)
Lower Skagit	2,300	16,000 – 22,000 (1.0)	16,000 (1.0)	3,900 (3.0)
Upper Skagit	8,920	17,000 – 35,000 (1.0)	26,000 (1.0)	5,380 (3.8)
Upper Cascade	330	1,200 – 1,700 (1.0)	1,200 (1.0)	290 (3.0)
Lower Sauk	660	5,600 – 7,800 (1.0)	5,600 (1.0)	1,400 (3.0)
Upper Sauk	370	3,000 – 4,200 (1.0)	3,030 (1.0)	750 (3.0)
Suiattle	420	600 – 800 (1.0)	610 (1.0)	160 (2.8)
NF Stillaguamish	660	18,000 – 24,000 (1.0)	18,000 (1.0)	4,000 (3.4)
SF Stillaguamish	240	15,000 – 20,000 (1.0)	15,000 (1.0)	3,600 (3.3)
Skykomish	1,700	17,000 – 51,000 (1.0)	39,000 (1.0)	8,700 (3.4)
Snoqualmie	1,200	17,000 – 33,000 (1.0)	25,000 (1.0)	5,500 (3.6)
N Lake WA/Sammamish	194*	4,000 – 6,500 (1.0)	4,000 (1.0)	1,000 (3.0)
Cedar	398*	8,200 – 13,000 (1.0)	8,200 (1.0)	2,000 (3.1)
Green	7,191*	17,000 – 37,700 (1.0)	27,000 (1.0)	Unknown
White	329*	Unknown	Unknown	Unknown
Puyallup	2,400	17,000 – 33,000 (1.0)	18,000 (1.0)	5,300 (2.3)
Nisqually	890	13,000 – 17,000 (1.0)	13,000 (1.0)	3,400 (3.0)
Skokomish	1,500*	Unknown	Unknown	Unknown
Mid-Hood Canal	389	5,200 – 8,300 (1.0)	5,200 (1.0)	1,300 (3.0)
Dungeness	123*	4,700 – 8,100 (1.0)	4,700 (1.0)	1,200 (3.0)
Elwha	1,319*	17,000 – 33,000 (1.0)	17,000 (1.0)	6,900 (4.6)
*Represents spawner escapement 1987 – 2001				

[1]The low productivity number in both the range and target represents one adult fish returning from the sea for each spawner, also called the equilibrium point (1:1).
[2]The high productivity number represents the number of spawners at the point where the population provides the highest sustainable yield for every spawner. The productivity ratio is in parentheses for each population and represents the relationship of fish returning from the sea for each spawner (e.g. 3.4:1 for NF Nooksack).

2.3.1.2 Listing Factor (Threats) Criteria

Listing factors are those features that were evaluated under section 4(a)(1) when the initial determination was made to list the species for protection under the ESA. These may or may not still be limiting recovery when in the future NMFS reevaluates the status of the species to determine whether the protections of the ESA are no longer warranted and the species could be "delisted." At the time of a delisting decision, NMFS will examine whether the section 4(a)(1) listing factors have been adequately addressed.

NMFS proposes that, to determine that the affected ESU is recovered to the point that it no longer requires the protections of the ESA, the listing factors should be addressed according to

specific criteria identified for each of them so that delisting is not likely to result in re-emergence of the threat. It is possible that current perceived threats will become insignificant in the future because of changes in the natural environment, changes in the way threats affect the entire life cycle of salmon, of the success of actions intended to ameliorate the threat. Consequently, NMFS expects that the significance of threats will change over time. It is also possible that new threats may be identified. During the status reviews, NMFS will evaluate and review the listing factor criteria under conditions at that time.

NMFS is providing the specific criteria listed below for each of the relevant listing/delisting factors to help to ensure that underlying causes of decline have been addressed and mitigated prior to considering a species for delisting. While the Shared Strategy Plan does not include explicit listing factor (threats) criteria, it does describe threats and limiting factors (Volume I, Chapter 3) in a manner that clearly corresponds to the section 4(a)(1) listing factors. For example, the Shared Strategy Plan describes the impacts on salmon that have resulted from habitat destruction by hydropower operation [4(a)(1)(A)] and harvest management [4(a)(1)(B)]. Accordingly, NMFS expects that if the Shared Strategy Plan's proposed actions to address the threats and limiting factors are implemented, they will make substantial progress toward meeting the listing factor (threats) criteria specified here.

Factor A: The present or threatened destruction, modification, or curtailment of a species' habitat or range. Each of the threats criteria described below is related to one or more of the major factors limiting recovery described in the Shared Strategy Plan and listed in NMFS 2006 Report to Congress on the Pacific Coastal Salmon Recovery Fund (PCSRF), i.e., (1) degraded floodplain and in-river channel structure; (2) degraded estuarine conditions and loss of estuarine habitat; (3) riparian area degradation and loss of in-river large woody debris; (4) excessive fine-grained sediment in spawning gravel; (5) degraded water quality and temperature; (6) degraded nearshore conditions; (7) impaired passage for migrating fish; and (8) severely altered flow regime.

To determine that the ESU is recovered, threats to habitat should be addressed as outlined below:

1. Channel function, including vegetated riparian areas, instream wood, streambank stability, off-channel and side-channel habitats, natural substrate and sediment processes, and channel complexity is restored to provide rearing, migration, and spawning habitat to meet the Recovery Plan's recovery goals.

2. Instream flow conditions and programs that support salmon rearing, spawning, and migration needs and meet the Chinook population targets are achieved.

3. Floodplain function and the availability of floodplain habitats for salmon is restored to a degree sufficient to support a viable ESU, including tidal swamp and marsh habitat in estuaries and the tidal freshwater portion of the lower rivers. This restoration should include connectedness between river and floodplain and the restoration of impaired sediment delivery processes and conditions affecting both estuaries and lower mainstem rivers.

4. Deleterious effects of stormwater runoff are eliminated or controlled so as not to impair water quality and quantity in salmonid streams or the riparian habitats supporting them.

5. Agricultural practices are implemented and programs are in place to protect and restore riparian areas, floodplains, and stream channels, and to protect water quality from sediment, pesticide, herbicide, and fertilizer runoff.

6. Urban and rural development, including land use conversion from agriculture and forest land to developed areas, does not impair water quality or result in dysfunctional stream conditions.

7. As appropriate or necessary to support region-wide recovery goals, passage obstructions (e.g. dams, tidegates, and/or culverts) are removed or modified to restore fish access to historically accessible habitat.

8. Nearshore processes are protected and restored so that ecological inputs (of sediment, insects, leaves and wood) to drift cells and mudflats function properly to support Chinook salmon and the species they prey upon. Programs are in place to ensure continued protection and restoration of water quality.

9. The effects of toxic contaminants on salmonid fitness and survival in the Puget Sound estuaries, lower mainstem rivers, and nearshore ocean are sufficiently limited and programs are in place to ensure continued limiting so as not to affect recovery.

10. Activities that dredge or fill in nearshore and river beds or harden stream banks are sufficiently mitigated.

11. Forest management practices that protect and restore watershed and stream functions are implemented on Federal, state, Tribal, and private lands and programs are in place to ensure continued mitigation.

12. Technical tools accurately assess the impacts of habitat management actions.

Draft watershed recovery plans that do not fully address all of these elements are not as likely to be successful as plans that comprehensively protect and restore ecological processes that support Puget Sound Chinook salmon (Montgomery et al., 2003, Beechie et al., 2003, Roni 2005, Bisson et al., 1997, Spence et al., 1996, Simenstad et al., 1982, and Gregory and Bisson 1997).

For additional information on current threats resulting from habitat degradation and loss, see the Shared Strategy Plan, Volume I, Chapter 3, the individual watershed chapters in Volume II, and the 2005 PCSRF Report to Congress.

Factor B. Overutilization for commercial, recreational, or educational purposes. To determine that the ESU is recovered, any utilization for commercial, recreational, scientific, or educational purposes should be addressed as outlined below:

1. Fishery management plans for salmon ESUs are in place that (a) accurately account for total fishery mortality (i.e., both landed catch and non-landed mortalities) and constrain mortality rates for individual populations to levels that are consistent with achieving ESU viability

(i.e., provide for adequate spawning escapement given intrinsic productivity for populations representative of the life history and major regional divisions in the ESU); and (b) are implemented so that any effects on the abundance, productivity, diversity, and spatial structure of populations are consistent with the recovery of the ESU.

2. Technical tools accurately assess the potential impacts of fishery management actions.

3. Rules and regulations for fishery management actions are effectively enforced.

For additional information on threats related to harvest actions, see Volume I, Chapters 3 and 6, and the individual watershed chapters in Volume II.

Factor C. Disease or predation. To determine that the ESU is recovered, any disease or predation that threatens its continued existence should be addressed as outlined below:

1. Hatchery operations apply measures that reduce the risk that natural Chinook salmon populations are adversely affected by fish diseases and parasites.

2. Suitable methods and levels of marine mammal control are identified and implemented to mitigate negative interactions with salmon where predation poses significant risks to recovery.

3. Populations of introduced game fish are managed such that competition with or predation on Chinook salmon does not impede salmon population recovery.

For additional information on current threats resulting from disease or predation, see the Shared Strategy Plan, Volume I, Chapter 3, and Volume II, individual watershed chapters.

Factor D. The inadequacy of existing regulatory mechanisms. To determine that the ESU is recovered, any inadequacy of existing regulatory mechanisms that threatens its continued existence should be addressed as outlined below:

1. Regulatory mechanisms are in place to ensure that any effects on the abundance, productivity, diversity, and spatial structure of populations are consistent with the recovery of the ESU.

2. Technical tools accurately assess the potential impacts of regulatory actions.

3. Rules and regulations for habitat protection and restoration are effectively enforced.

4. Fisheries Management Plans are effectively enforced.

5. Habitat conditions, watershed functions and nearshore processes are protected and restored through land-use planning that guides human population growth and development.

6. Habitat conditions and watershed function are protected and restored through regulations that govern resource extraction such as timber harvest and gravel mining.

7. Habitat conditions, watershed functions and nearshore processes are protected and restored through land protection agreements as appropriate, where existing policy or regulations do not provide adequate protection.

8. Adequate resources, priorities, regulatory frameworks, and coordination mechanisms are established and/or maintained for effective enforcement of land and water use regulations that protect and restore habitats and marine and freshwater water bodies and for the effective management of fisheries.

9. Regulatory, control, and education measures to prevent additional exotic species invasions are in place.

For additional information on existing regulatory mechanisms, see the actions in Volume I, Chapter 6. and Volume II, individual watershed chapters.

Factor E. Other natural or man-made factors affecting continued existence. To determine that the ESU is recovered, other natural and man-made threats to its continued existence should be addressed as outlined below:

1. Hatchery management plans are in place to ensure that any effects on the abundance, productivity, diversity, and spatial structure of populations are consistent with the recovery of the ESU.

2. Technical tools accurately assess the potential impacts of hatchery management actions.

3. Rules and regulations for hatchery management and protection are effectively enforced.

4. Hatchery programs are operated in a manner that is consistent with individual watershed and region-wide recovery approaches; appropriate criteria are used for the integration of hatchery Chinook salmon populations and extant natural populations inhabiting watersheds where the hatchery fish return.

5. Hatcheries operate using appropriate ecological, genetic, and demographic risk containment measures for (1) hatchery-origin adults returning to natural spawning areas, (2) release of hatchery juveniles, (3) handling of natural-origin adults at hatchery facilities, (4) withdrawal of water for hatchery use, (5) discharge of hatchery effluent, and (6) maintenance of fish health during their propagation in the hatchery.

6. Hatcheries mark or tag Chinook salmon so that they can be differentiated from natural Chinook salmon in fisheries, migratory areas, and as adults returning to hatcheries and natural spawning areas.

7. Mechanisms are in place to reduce the incidence of, and impacts from, introduced, invasive, or exotic species.

8. Nutrient enrichment programs must be evaluated to determine where additional nutrient inputs can provide significant benefits.

9. Ecological functions of salmon, including their benefits in cycling ocean-derived nutrients into freshwater areas, are considered in fishery, hatchery, and habitat management.

10. Funded, active research that aids in predicting the effects of climate change on salmon recovery is in place and there are Federal and state commitments to respond to findings from the research.

2.3.1.3 Application of the Criteria to Delisting Decisions

NMFS concludes that the Recovery Plan meets the first of the 4(f) requirements for a recovery plan: it has objective, measurable criteria which, when met, would result in a determination that the species be removed from the list.

The biological (2.3.1.1) and listing factor (threats) criteria (2.3.1.2), when taken together, describe conditions, commitments, and administrative measures that, when met, would result in a determination that the species is not likely to become endangered within the foreseeable future throughout all or a significant portion of its range. If NMFS reaches this determination, then it can recommend that the species be removed from the list of endangered and threatened species.

In accordance with our responsibilities under section 4(c)(2) of the Act, NMFS will conduct status reviews of Puget Sound Chinook salmon at least once every five years to evaluate the ESU's status and determine whether the ESU should be removed from the list or changed in status. Such evaluations will take into account the following:

- The biological recovery criteria (Ruckelshaus et al., 2002) and listing factor (threats) criteria described above.
- Principles presented in the Viable Salmonid Populations paper (McElhany et al., 2000).
- Co-managers' recovery planning targets.
- Best available information on population and ESU status and new advances in risk evaluation methodologies.
- Considerations consistent with the VSP paper and the PSTRT's recommendations, including: the number of viable populations; the number and status of other extant populations; the extinction risk of all populations; the distribution of viable populations relative to the range of historical conditions supporting viable populations; linkages and connectivity among viable populations; the diversity of life history and phenotypes expressed; and considerations regarding catastrophic risk.
- Principles laid out in NMFS Hatchery Listing Policy (70 FR 37204, June 28, 2005).

2.3.2 *Site-Specific Management Actions*

The ESA requires a recovery plan to incorporate, "to the maximum extent practicable," "a description of site-specific management actions necessary to achieve the Recovery Plan's goal for the conservation and survival of the species" (ESA 4(f)(1)(B). NMFS believes the Recovery Plan meets this requirement; the basis for this conclusion is included in this section.

Volume II of the Shared Strategy Plan contains detailed strategies and actions for Chinook populations in all 14 watersheds (except the Hood Canal Skokomish Chinook population, discussed further in Section 2.3.2.1) and the nearshore areas in Puget Sound. The watershed profiles presented in Volume I, Chapter 5 summarize the key strategies and actions proposed in each of the local plans. The watershed plans propose actions to address limiting factors identified through their local watershed assessments. Each watershed group provided its own set of protection and restoration management strategies for specific subbasin, river reaches, estuaries, and nearshore areas tailored to the conditions of their watershed.

In all watersheds, the actions are based on the results of local watershed and regional technical assessments. In addition, each of the watershed profiles in Volume I includes a summary of key uncertainties and the enhancements identified by the PSTRT and the Shared Strategy interagency policy group during its May 2005 review of the watershed plans that are needed to reduce uncertainty and risk to the populations and ESU. Those additional measures were developed to provide greater specificity regarding the necessary management actions and priorities for implementation in each watershed. Where appropriate, the PSTRT and interagency policy group recommended sequencing actions to maximize the potential benefit to the populations. They also identified specific issues for inclusion in the adaptive management program at both local and regional scales to address uncertainties over time. NMFS assumes that the watershed groups will implement these additional measures and recommendations.

After the PSTRT review, NMFS reviewed all the watershed chapters, including many of their supporting documents. NMFS agrees with the Shared Strategy Plan's approach that as plan implementation and adaptive management proceeds, proposed actions in each watershed will be further refined and sequenced for implementation in a manner that specifically addresses the primary factors limiting recovery. NMFS strongly supports testing hypotheses about limiting factors through adaptive management and monitoring.

NMFS agrees with the Shared Strategy Plan that some strategies and actions need to be implemented at the ESU scale to address the factors limiting recovery. These are described in Volume I, Chapter 6 of the Shared Strategy Plan. As plan implementation and adaptive management unfolds, NMFS will continue to work with the Shared Strategy participants and each watershed to ensure that priorities for implementing recovery actions at the regional or ESU level continue to be set in a manner that is consistent with the major limiting factors for the ESU.

NMFS acknowledges the sources of uncertainty identified by the PSTRT and generally supports the recommendations to reduce them (see Results section of watershed profiles, Volume I, Chapter 5). NMFS concludes that implementing the hatchery, harvest, and habitat watershed and regional plan elements, inclusive of the PSTRT recommendations in Chapter 5, with careful monitoring of results so that adjustments in strategies and actions can be made, is acceptable to increase certainty over time that populations will persist over the long-term.

As the Shared Strategy Plan notes, all of the watersheds will be revising the site-specific actions in their 10-year plans as implementation proceeds and more information becomes available. NMFS recognizes that additional site-specific actions will need to be or are currently being

developed in the Skokomish, Skagit, Lake Washington (Cedar/Sammamish), Green/Duwamish, and Puyallup/White watersheds, and supports those proposals that are included in the Shared Strategy Plan for doing so. NMFS has the following comments regarding these watersheds.

2.3.2.1 Skokomish

In the Hood Canal biogeographical region, the PSTRT identified two Chinook salmon populations—the Mid-Hood Canal and Skokomish. In order to meet the ESU viability criteria established by the PSTRT, both of these populations need to achieve a low risk status over time. It was not possible to produce a watershed plan for the Skokomish Chinook salmon population in time for inclusion in the Shared Strategy Plan because of ongoing litigation over Cushman Dam in the Skokomish River basin. Accordingly, NMFS advocated a precautionary approach in watershed planning to preserve future options for recovering the Skokomish population. NMFS and the PSTRT reviewed the Mid-Hood Canal watershed plan (summarized in the Shared Strategy Plan, Volume I, Chapter 5, pp. 302-315) and proposed measures that we assume are incorporated to ensure that future recovery options for both Hood Canal Chinook salmon populations would be preserved.

NMFS understands that state and Tribal co-managers, with support and involvement from the U.S. Fish and Wildlife Service and Olympic National Park, are currently in the process of writing a local plan for the Skokomish River basin. The local plan authors anticipate additional collaboration with members of the Hood Canal Coordinating Council as plan development proceeds. The plan will cover all aspects of salmon recovery in the Skokomish watershed and other relevant areas. They intend to complete that plan in 2007. NMFS will review that plan when it becomes available and will work with the co-managers and local jurisdictions to ensure the integration of habitat, harvest, and hatchery actions applied to recover the Skokomish population. The Recovery Plan will be updated accordingly.

2.3.2.2 Skagit

The Shared Strategy Plan states that the 2005 Skagit Chinook Recovery Plan was developed by the Swinomish Indian Tribal Community, the Sauk-Suiattle Indian Tribe, and the Washington Department of Fish and Wildlife (Volume I, Chapter 5). The Shared Strategy Plan further states that the Tribes and state hope to engage local groups and individuals to improve the Skagit plan and gain commitments to implementation. NMFS believes the 2005 Skagit Chinook Recovery Plan includes a solid technical foundation for conserving Chinook salmon and supports the ongoing effort among Tribal, state, county, and local groups in the Skagit to reach agreements on the watershed plan through a collaborative process at the local level. NMFS will continue to work with all the parties as that collaboration proceeds.

In its draft Supplement to the Shared Strategy Plan, NMFS acknowledged existing disagreements among various parties in the Skagit Basin about certain aspects of the local watershed plan. NMFS stated that “If the tribal, state, and local interests can reach agreement on science-based, locally supported plan modifications before this Supplement is finalized in the Federal Register, NMFS will strive to include agreed-to modifications in the final Federal Register notice in early 2006. For areas where no agreement is reached, NMFS will need to make a determination among

competing interests regarding the most appropriate path to take regarding adoption of a final plan." Since publication of the Supplement in 2005, NMFS has received no proposals for plan modifications. NMFS understands that substantially improved collaboration among parties is occurring in the Skagit watershed and plan implementation is underway. Multiple parties in the Skagit basin worked together in early 2006 to prepare a three-year salmon recovery implementation plan and they submitted that plan for review by the TRT, NMFS and the Salmon Recovery Council staff as part of the Puget Sound Salmon Recovery Council's process. NMFS is encouraged by this and other cooperative efforts in the basin that demonstrate progress toward plan implementation.

Based on the absence of a science-based, locally supported alternative to the Skagit watershed plan, NMFS accepts the 2005 Skagit Chinook Recovery Plan as the local recovery plan for that area. NMFS expects the Skagit plan will be appropriately modified over time as will the other watershed chapters and the regional chapter (Volume 1) of the Shared Strategy Plan, as new information becomes available and Plan implementation and adaptive management proceed. NMFS recognizes the important role the Skagit Watershed Council is playing in bringing diverse interests in the basin together to find common ground and to advance salmon recovery. NMFS strongly encourages stakeholder involvement in the development of site-specific actions, and strongly supports the continued involvement of the Council in local plan implementation and collaboration building.

2.3.2.3 Lake Washington (Cedar/Sammamish)

NMFS expects the WRIA 8 technical committee will continue to refine the recovery planning targets for the Lake Washington (Cedar/Sammamish) and the actions and strategies necessary to meet them as the plan is implemented and adaptively managed over time. In the interim, NMFS accepts the watershed plan's objective of managing habitat to reach properly functioning conditions, and to use a combination of the PSTRT's population viability assessments and recovery planning targets provided by the Washington Department of Fish and Wildlife as population level recovery goals. NMFS recognizes the recovery goals may be modified during plan implementation as additional information about habitat and population status, and population viability become available.

NMFS understands that the Watershed Resource Inventory Area 8 (WRIA) group responsible for submitting the habitat protection and restoration plan for the Lake Washington watershed will actively work with the co-managers to integrate proposed habitat-related recovery actions with co-manager harvest and hatchery plans for salmon populations in the watershed. NMFS expects that the WRIA 8 group and the co-managers will follow suggestions for integrating habitat, harvest, and hatchery actions that are included in the Shared Strategy Plan's Chapter 5 "Profile Results" sections and in the PSTRT's technical guidelines (Ruckelshaus et al., 2003). NMFS will assist this collaborative process through government-to-government meetings with the Muckleshoot Tribe and Suquamish Tribe to ensure that the resultant integrated plan for the Lake Washington watershed adequately addresses issues relating to treaty-reserved fishing rights.

2.3.2.4 Green/Duwamish

As noted in the Volume II plan for the Green/Duwamish watershed, there is a need to integrate hatchery and harvest plans developed by the co-managers with the habitat protection and restoration plan for the watershed submitted by the WRIA 9 group. NMFS expects that the WRIA 9 group and the co-managers will follow suggestions for integrating habitat, harvest, and hatchery actions that are included in the Shared Strategy Plan's Chapter 5 "Profile Results" sections and in the PSTRT's technical guidelines (Ruckelshaus et al., 2003). NMFS will assist this collaborative process through government-to-government meetings with the Muckleshoot Tribe and Suquamish Tribe to ensure that the resultant integrated plan for the Green watershed adequately addresses issues relating to treaty-reserved fishing rights.

2.3.2.5 Puyallup/White

NMFS recognizes that since the review in 2005 of the habitat protection and restoration plan submitted by Pierce County and the separate state and Tribal co-managers' salmon recovery plan, substantial progress has been made to merge the two recovery planning approaches. NMFS applauds those efforts and acknowledges the importance of the ongoing effort to establish a common adaptive management framework to guide recovery plan implementation. The long-term goal of the White River Chinook Recovery Plan (Muckleshoot Indian Tribe et al., 1996) is "to restore the native population of White River spring Chinook stock in the White River watershed to a healthy, productive condition." The White River Chinook Recovery Plan currently is being revised; recovery planning targets will be updated during plan revision.

Measurable goals for the White River population are under study and will be developed as H-integration is achieved in the watershed (Plan Volume 1, Chapter 5). The co-managers and Pierce County have initiated steps that will enable them to advance integration of the habitat, harvest, and hatchery factors, adaptive management, and other plan elements. NMFS supports and encourages this collaboration to combine the two plans. NMFS expects that Pierce County and the co-managers will follow suggestions for integrating habitat, harvest, and hatchery actions that are included in the Shared Strategy Plan's Chapter 5 "Profile Results" sections and in the PSTRT's technical guidelines (Ruckelshaus et al., 2003). NMFS will assist this collaborative process through government-to-government meetings as appropriate with the Puyallup Tribe and Muckleshoot Tribe to ensure that the resultant plan for the Puyallup/White watershed adequately addresses issues relating to treaty-reserved fishing rights.

2.3.3 *Time and Cost Estimates*

The Shared Strategy Plan estimates that recovery of Puget Sound Chinook salmon will take "several decades," or 50 to 100 years. Chapter 8 of the Shared Strategy Plan summarizes cost estimates for the measures needed to achieve the Plan's goal and to achieve intermediate steps toward that goal. Recovery objectives and strategies are aimed at the long-term recovery goal. Volume I, Chapter 8 and the individual watershed plans in Volume II provide cost estimates to carry out specific recovery actions for the first 10 years of plan implementation, as well as cost estimates for programs that span multiple watersheds: hatchery improvements, nearshore and marine habitat protection and restoration, and incentive programs for habitat restoration and conservation on farm and small forest lands (Chapter 8, Figure 8.1, p. 458). The total cost is estimated at approximately $120 million per year for the first 10 years. Implementing this first

phase is expected to result in improved conditions for all Puget Sound Chinook populations and to put the ESU on a trajectory toward recovery.

NMFS supports the policy determination to focus on the first 10 years of implementation, with the proviso that before the end of this first implementation period, specific actions and costs to achieve long-term goals will be estimated for subsequent years, to proceed until a determination is made that listing is no longer necessary. NMFS agrees that 10 years is a reasonable period of time during which to implement and evaluate the actions identified in the Recovery Plan to gain a preliminary view of the status and trends of important recovery indicators and make mid-course corrections as needed. NMFS further understands that each watershed area will, if it has not already done so, prioritize its 10-year actions and establish work plans in shorter time-increments to match the availability of funding sources. NMFS strongly supports the Shared Strategy Plan's intention to conduct additional economic analyses into the adaptive management process over time and to use these in realigning priorities as appropriate.

NMFS recognizes that the breadth and completeness of the time and cost estimate components of the local watershed plans is quite varied. NMFS anticipates that as implementation of the Recovery Plan proceeds and as watershed groups finalize their priorities for project implementation and sequencing, they will develop more explicit estimates of time and cost. In spring 2006, the watershed groups completed three-year work plans reflecting the first set of implementation priorities of the 10-year recovery plans. The PSTRT and Recovery Council Policy Work Group reviewed and found the three-year work plans consistent with the recovery plan. These plans are not being used to develop specific funding requests from a variety of sources, including the Salmon Recovery Funding Board (SRFB) and the State capital budget through Partnership for Puget Sound.

The Shared Strategy Plan acknowledges that available funding may not fully cover each watershed's full 10-year plan. The PSTRT's conclusions about the certainty of achieving plan outcomes assume implementation of the entire 10-year suite of priority actions. NMFS encourages regional leaders to address this issue as results and progress become apparent in the next 10 years—they may need to re-evaluate the funding strategy to determine whether the fundraising goal will need to be adjusted.

NMFS concludes that the Recovery Plan meets the third of the 4(f) requirements for a recovery plan: it includes estimates of the time required and cost to carry out the measures that may be necessary to achieve the plan's goal and to achieve intermediate steps toward that goal.

2.3.4 *ESA section 4(f) Conclusion*

NMFS reviewed the Shared Strategy Plan (Volume I and the individual watershed chapters in Volume II) as well as the notes and conclusions of the PSTRT from its review of the watershed plans in May 2005. Based on that combined evaluation, NMFS believes that the Shared Strategy Plan (Volumes I and II, including relevant monitoring and adaptive management elements) as enhanced by this Supplement meets the recovery plan requirements in section 4(f) of the Endangered Species Act.

3.0 NMFS INTENDED USE OF THE ESA RECOVERY PLAN

As noted above, NMFS prefers to rely on locally developed recovery plans to the extent possible. By endorsing a locally developed recovery plan, NMFS makes a commitment to implement the actions in the Recovery Plan for which it has authority, to work cooperatively on implementation of other actions, and to encourage other Federal agencies to implement plan actions for which they have responsibility and authority. NMFS will also encourage the State of Washington to seek similar implementation commitments from state agencies and local governments.

3.1 ESA-Related Decision-Making

Recovery plans provide context and a technical foundation for NMFS decisions.

3.1.1 *Using Recovery Plans in Regulatory Reviews*

NMFS will use completed recovery plans to:

- Ensure an integrated approach to ESA section 7 consultations across all "Hs."
- Judge the significance of proposed actions relative to the importance of the affected habitat and population for ESU survival and recovery.
- Guide ESA section 7 consultations, HCP review and approvals, section 4(d) rules, and permitting applications for proposed actions consistent with recovery plans.
- Evaluate the degree to which a proposed Federal action is consistent with an applicable recovery plan in making ESA determinations.

Future regulatory reviews under sections 7 and 10 of the ESA will be affected by this recovery plan. The Shared Strategy Plan describes the most significant limiting factors and threats facing the ESU as well as the greatest opportunities for improving survival across the Hs. This information will provide important context for evaluating the effects of actions subject to sections 7 and 10 in Puget Sound. Recovery plan information that should aid these evaluations include: descriptions of independent populations; viability criteria for abundance, productivity, diversity and distribution; limiting factors and threats; and geographic and temporal context for considering risks and for prioritizing recovery actions.

Future section 7 consultations can also be affected by recovery plans because Federal programs will need to incorporate the technical assessments completed by non-Federal entities. For example, biological assessments for section 7 consultations in any given watershed would benefit from incorporating technical information from Volumes I and II of the Shared Strategy Plan.

Section 7 consultations could also be affected by recovery plans as a result of more effective use of section 7 conservation recommendations. The Federal agencies should anticipate that significant improvements in survival are needed to recover listed ESUs. Section 7(a)(1) states that the Federal agencies shall, in consultation with NMFS, utilize their authorities in furtherance

of the purposes of the ESA by carrying out programs for the conservation of listed species. Section 7 conservation recommendations may provide an appropriate vehicle for NMFS to encourage Federal conservation programs in the affected area.

3.1.2 *Applying Viability Criteria to Ongoing ESA Decision Making*

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 significantly from current conditions. Accordingly, most watershed planners in areas with independent populations of Chinook salmon chose to work toward low risk status for their respective populations, setting the stocks on a trajectory toward recovery for the next 10 years, and following a precautionary approach in reserving options for eventual recovery of the entire ESU. (Table 1 in this Supplement relates the risk status of the 22 populations and ESU viability.)

NMFS believes that a systematic approach is needed to identify those Chinook salmon populations that should receive the highest priority for recovery activities, with the overarching goal of meeting ESU delisting criteria. This position is based on the premise that not all of the 22 Puget Sound Chinook salmon populations or their watersheds have the same role in contributing to the recovery of the ESU. Key considerations are the uniqueness, status, and physical location of the population, the present condition of the population's freshwater, estuarine and adjacent nearshore habitats, and the likelihood for preserving and restoring those habitats given present and likely future condition. NMFS does not suggest that any populations or watersheds should be neglected. Although a "preserve and restore the best" strategy is sensible, all populations and watersheds will still need to be sufficiently protected to enable the production of sustainable anadromous salmon populations.

NMFS is working with the co-managers and the Puget Sound Salmon Recovery Council Work Group to develop a biologically sound process for identifying which populations, watersheds and associated nearshore areas most need immediate protection and restoration investments. The approach should promote consistency in the ESU between the watershed groups implementing the recovery plan, and NMFS ESA regulatory assessments throughout Puget Sound.

3.2 Best Available Science

In some instances, NMFS believes that science other than that provided in Volumes 1 and II of this recovery plan may be more applicable in addressing specific recovery issues. Therefore, NMFS believes that this recovery plan is based on the best available science except for those specific issues where NMFS determines, through a critical assessment of all available scientific information, that alternative scientific conclusions are warranted. NMFS is committed to work with local watershed planning groups to share and gain information and perspectives so that plan implementation efforts across Puget Sound can improve over time.

3.3 Changes Incorporated Over Time

The ESA requires a review of all listed species at least once every five years. Guidance for these reviews is on the NMFS website (http://www.nmfs.noaa.gov/pr/laws/esa/policies.htm#recovery). Furthermore, NMFS Interim Endangered and Threatened Species Recovery Planning Guidance

(NMFS Recovery Guidance) (NMFS 2004) requires that immediately following this five-year review, approved recovery plans will be reviewed, in conjunction with implementation monitoring, to determine whether or not the plan needs to be brought up to date.

NMFS Recovery Guidance describes three types of plan modifications: 1) an update; 2) a revision; or 3) an addendum. An update involves relatively minor changes. An update may identify specific actions that have been initiated since the plan was completed, as well as changes in species status or background information that do not alter the overall direction of the recovery effort. An update does not suffice if substantive changes are being made in the recovery criteria or if any changes in the recovery strategy, criteria, or actions indicate a shift in the overall direction of recovery; in this case, a revision would be required. Updates can be made by NMFS and would be forwarded to stakeholders and cooperators and posted on the NMFS website. An update would not require a public review and comment period. NMFS expects that updates will result from implementation of the adaptive management program for this plan. Minor addenda such as information updates to implementation strategies also can be added to a plan after it has been approved.

A revision is a substantial rewrite and is required if major changes are needed in the recovery strategy, objectives, criteria, or actions. A revision may also be required if new threats to the species are identified, when research identifies new life history traits or threats that have significant recovery ramifications, or when the current plan is not achieving its objectives. Revisions represent a major change to the recovery plan and must include a public review and comment period.

4.0 ABBREVIATIONS

AMM	adaptive management and monitoring
CERC	critical exploitation rate ceilings
ESA	Endangered Species Act
ESU	evolutionarily significant unit
GMA	Growth Management Act (Washington)
HCP	Habitat Conservation Plan
HGMP	Hatchery and Genetic Management Plan
Hs	Habitat, harvest, hatcheries, hydropower
NEPA	National Environmental Protection Act
NMFS	National Marine Fisheries Service
NOA	Notice of Availability
PCSRF	Pacific Coastal Salmon Recovery Fund
PSTT	Puget Sound Treaty Tribes
PST	Pacific Salmon Treaty
PSTRT	Puget Sound Technical Recovery Team
RERs	rebuilding exploitation rates
RMP	Resource Management Plan
SMA	Shoreline Management Act (Washington)
TRT	Technical Recovery Team
USFWS	U.S. Fish and Wildlife Service
VSP	viable salmonid population
WDFW	Washington Department of Fish and Wildlife
WRIA	Watershed Resource Inventory Area (Washington)

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APPENDIX A

Progress report to NMFS:
Regional Adaptive Management and Monitoring Plan for Puget Sound salmon recovery

Summary

Shared Strategy for Puget Sound's commitment to develop a regional adaptive management and monitoring plan by the end of 2006 is still on schedule.
Specific technical and policy issues for regional adaptive management and monitoring were detailed in the draft Puget Sound Salmon Recovery Plan and are incorporated into the adaptive management plan. These include issues related to protection of existing habitat, water quality and quantity, nearshore, climate change, and H-integration.

Implementing the adaptive management and monitoring program in the Puget Sound region is contingent upon receiving funding. The Puget Sound Salmon Recovery Council is in the process of finalizing a three-year investment strategy that includes cost estimates for this purpose.

Below are progress updates that specifically respond to the five action items for regional adaptive management and monitoring on page15 of the 2005 NOAA Supplement to the Draft Puget Sound Salmon Recovery Plan:

1. Clarify how plan strategies link to plan goal and objectives

Shared Strategy has adopted the Ecosystem Management Initiative's approach to developing an adaptive management plan. This approach involves tightly linking strategies to recovery goals and actions—these were summarized in a "Situation Map." The draft regional adaptive management and monitoring plan is structured accordingly.

2. Develop specific draft measures of success by January 2006 with finals by April 2006

Draft measures were developed at a January 2006 Puget Sound adaptive management workshop. Refining and incorporating the draft measures is under way and will be completed by the end of 2006.

3. Hold a series of meetings or workshops with watershed and regional groups to identify metrics, performance standards at the ESU scale, and a decision-making and accountability structure by February 2006 and beyond if needed.

A series of meetings and workshops have been and continue to be held in 2006 to identify metrics, ESU performance standards and decision-making and accountability structures. The Adaptive Management and Monitoring Steering Committee mentioned above meets on a regular schedule. This committee has representation from all levels of government within Puget Sound. Committee subgroups have been assigned to various sections of the plan, and are the first reviewers of draft material. After their reviews are incorporated, refined material is sent to watershed implementation leads, and state and tribal co-managers for their review. Sections concerning the integration of habitat, harvest, and hatchery actions will also be reviewed by the All-H Leadership Group. The All-H Leadership Group, a committee of the Puget Sound Salmon Recovery Council, meets monthly and is developing the Verification and Accountability System for the plan. The adaptive management plan is scheduled for review and discussion at the November Puget Sound Recovery Council meeting.

Two workshops were held in 2006. The first, in January, was a two-day workshop to draft metrics, discuss performance standards and decision structures. The second, in June, was a two-day workshop to present an approach for advancing H-Integration, the first regional-scale issues identified in the salmon recovery plan as needing to be addressed as part of adaptive management. Results from the June workshop will be incorporated into the adaptive management plan.

4. Conduct an assessment to identify existing programs, where programs or program enhancement are needed, and opportunities for coordination between programs (e.g. between the Washington Forest Practices Rules as amended in 2002 and salmon recovery); Coordinate with existing monitoring efforts statewide (i.e. Governor's Forum on Monitoring)

Shared Strategy staff identified existing state and federal agency programs related to salmon recovery needs. Shared Strategy received commitment letters in response to requests for coordinating efforts. (see section on commitments)

Staff has also participated in discussions and meetings of the Governor's Forum on Monitoring and continues to work, along with the Steering Committee sub-committees, to synchronize our respective approaches to the extent feasible.

5. Develop an adaptive management and monitoring program that is integrated between the watershed and regional scales, and that provides a structure for linking decision-making.

The adaptive management and monitoring program under development will integrate watershed, regional and state scales. Most of the metrics being developed by this adaptive management and monitoring plan will be reported by the watersheds and summarized at a regional scale. There will also be a decision-making link between the watershed groups and a regional decision-making body.

Regional groups like Shared Strategy for Puget Sound will have an important role in shaping the data collected for statewide monitoring reports. These statewide reports serve several needs, including development of an annual State of the Salmon Report, reporting recovery progress to support allocation decisions for the Pacific Coastal Salmon Recovery Fund, and also supporting a delisting decision by providing Evolutionarily Significant Unit-wide data on biological fish data and habitat status and trends data.

APPENDIX B

Progress Report to NMFS on implementing H-Integration:

An H-Integration work group (H-I work group) and the All-H Leadership Group (both arms of the Puget Sound Salmon Recovery Council) developed a six-step process for making progress on both technical and policy fronts to integrate complementary suites of actions among the H-sectors. The H-I work group presented the six steps at a two-day June workshop to technical and policy watershed leads from each watershed as well as tribal, state and federal agency staff. Participant feedback at the conclusion of the workshop indicated that they support the 6 steps.

The six steps are:

1. Identify the people that need to participate and how to involve them (see first bullet under successful integration involves).
2. Gain a common understanding of how the system works—habitat conditions and fish populations.
3. Agree upon common goals that reflect salmon recovery needs and community values and a set of outcomes across the H-sectors that describe what will be achieved related to those goals in measurable terms.
4. Examine, evaluate and select a suite of complementary actions to achieve the outcomes.
5. Document rationale, implementation steps (specific complementary actions in hatcheries, harvest, and habitat), expected outcomes (including effects on VSP), and benchmarks.
6. Monitor results, prepare annual performance reports and adjust over time using a verification, effectiveness and accountability system.

Work program for implementing or advancing H-Integration efforts in Puget Sound watershed areas:

Following the June workshop, the following work program was developed:

1. Sequence H-I implementation in two primary timeframes across the watersheds as determined by watershed self-selection (i.e. those ready to go right away versus those needing more time)
    a. First group completes 6 steps by May/June 2007
    b. Second group completes 6 steps by August 2007
2. Watersheds without independent Chinook spawning populations (i.e. the four “nearshore watersheds” will address H-Integration needs as part of the development of a regional nearshore strategy that will include H-Integration steps.)
3. Watersheds (except the nearshore watersheds) prepare an H-Integration implementation/advancement plan (using the 6 steps as a guide) by November 2006.

Proposed Implementation Timeline

July 2006	Discuss and refine proposal with: co-managers, watershed leads, All-H leadership group, recovery council, and H-Integration workgroup and Adaptive Management Steering Committee (completed)
August/Sept. 2006	Identify sequence for which watersheds are in the first and second group and develop checklist tool to guide watersheds to prepare H-I plans (completed)
Winter '06-'07	Provide technical tools workshop (under development)
November 2006	First milestone check with watershed areas regarding their H-I plans
May/June 2007	Group1 watersheds complete first iteration of the 6 steps according to their H-I plan and submit progress and action plan report
August 2007	Group 2 watersheds complete first iteration of the 6 steps according to their H-I plan and submit progress and action plan report

Expected Reporting Levels on continuing H-integration efforts:

The sub-committee is proposing three levels for reporting and tracking progress:

1. Regularly scheduled benchmarks to report progress and identify issues and needed support matched to watershed H-I plans—e.g. problem solving meetings during implementation
2. Annual reporting on progress as part of the verification and accountability system in the adaptive management program.
3. Updates to three-year watershed work plans that incorporate complementary suites of actions and make it clear how these are integrated

APPENDIX C

Additional emphasis on protection of life history diversity in the Whidbey Basin biogeographical region

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The recovery criteria for Puget Sound Chinook salmon require that "at least one population from each major genetic and life history group historically present within each of the five biogeographical regions is viable." Identifying these life-history groups to implement the recovery plan is especially critical in the Whidbey Basin where the 10 populations have diverse life-histories. The NMFS Federal Supplement identifies two major life history groups overall in the Puget Sound ("early" and all the others, Table 1) but this classification has serious errors. It should not be used.

Below are two classifications from other analyses: 1) the co-manager's Salmon and Steelhead Stock Inventory (SASSI) and 2) the Puget Sound Technical Recovery Team's (TRT) population identification analysis (Fig. 7, 8, in Ruckelshaus et al. 2006). The TRT analysis was based on spawn timing (as opposed to freshwater entry timing), used the best data, and was statistically the most rigorous. See WDFW and WWTT 1992 for description of SASSI methods.

There is general agreement between the TRT analysis and the SASI analysis. However, the TRT analysis suggests the Suiattle population is distinct from the typical spring/summer life-history because of its very early spawn timing. This indicates that the Suiattle should be identified as one of the "required" low risk populations as it is the only one of its kind this region. Based on the dendrogram (Fig. 7, Ruckelshaus et al. 2006), there appear to be as many as three additional life-history groups in the region, although it may be possible to combine the "early" and "moderately-early" group into a single group. This would ignore the considerable differences among these populations, however.

Table 1. Classifications of life-history groups in the Whidbey Basin.

	Source		
Population	**SASSI**	**TRT**	**NMFS Supplement**
Suiattle	Spring	Very-Early	Early
Lower Skagit	Fall	Late	Late
Upper Skagit	Summer	Moderately early	Late
Cascade	Spring	Moderately early	Early
Lower Sauk	Summer	Moderately early	Late
Upper Sauk	Spring	Early	Early
NF Stillaguamish	Summer	Early	Late
SF Stillaguamish	Fall	Moderately early?[4]	Late
Skykomish[5]	Summer/Fall	Late	Late
Snoqualmie[6]	Fall	Late	Late

Implications for Recovery Plan

For the purpose of implementing the recovery plan, I recommend using the TRT's analysis. Based on this analysis, Table 1 in the NMFS Federal Supplement should be updated as follows:

[4] TRT cluster analysis groups this with the moderately-early group, although spawning timing is not much different than early returning Skykomish Chinook, which have a broad spawn timing where early spawning begins at the tail end of the moderately-spawning populations but extends to late spawning timing.

[5] This is two SASI stocks: Snohomish summers + Bridal Veil falls.

[6] This is two SASI stocks: Snohomish falls + Wallace River

Biogeographical Region	Chinook Populations	Need at Low Risk
Strait of Georgia	North Fork Nooksack South Fork Nooksack	North Fork Nooksack South Fork Nooksack
Strait of Juan de Fuca	Elwha Dungeness	Elwha Dungeness
Hood Canal	Skokomish Mid-Hood Canal	Skokomish Mid-Hood Canal
Whidbey Basin	Skykomish (late) Snoqualmie (late) NF Stillaguamish (early) SF Stillaguamish (moderately early) Upper Skagit (moderately early) Lower Skagit (late) Upper Sauk (early) Lower Sauk (moderately early) Suiattle (very early) Cascade (moderately early)	Suiattle (very early) and 1 each of the early, moderately early, and late forms
Central/South Sound	Samammish (late) Cedar (late) Green/Duwamish (late) Puyallup (late) White Nisqually	White (early) and Nisqually or 1 of the other late forms

Additional Analyses

These conclusions are based on the analysis the TRT conducted during their population identification analyses. It may be possible to use additional data, if they have become available, to expand this analysis beyond spawn timing. At the time of the TRT's analyses these other data were too incomplete to use. The TRT used cluster analysis as an objective, repeatable method to identify different groups, although in general spawn timing is continuous across the Puget Sound and tends to vary in a latitudinal cline as well as among populations at the same latitude. These cluster analyses could be refined to account for latitudinal trends and to estimate the Type I and Type II error associated with the classifications.

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