

# 2011 IMPLEMENTATION STATUS ASSESSMENT

## FINAL REPORT



Photo courtesy of the Puget Sound Partnership

### *A Qualitative Assessment of Implementation of the Puget Sound Chinook Salmon Recovery Plan*

### **A Report for the National Marine Fisheries Service**

Task Order 2002 – Puget Sound Chinook Recovery Tracking

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# I. Introduction

Puget Sound Chinook Salmon was listed as “threatened” under the Endangered Species Act (ESA) in 1998. Nine years later, after a series of local efforts to create a response to the listing, a nonprofit organization known as the Shared Strategy for Puget Sound succeeded in creating the nation’s first locally-written species recovery plan under the ESA. The National Marine Fisheries Service (NMFS) adopted the Shared Strategy’s 2005 Puget Sound Chinook Salmon Recovery Plan (“Recovery Plan”) in January, 2007. The Recovery Plan consists of a 2-volume Recovery Plan containing regional and 14 watershed-specific strategies to recover Puget Sound Chinook Salmon within its evolutionarily significant unit (ESU), together with the NMFS’s Final Supplement to the Shared Strategy Recovery Plan. It was adopted pursuant to Section 4(f) of the Endangered Species Act. The Recovery Plan is the culmination of years of local collaborative work designed to achieve recovery of the species, while ensuring the social and economic prosperity of the Puget Sound region.

The Recovery Plan is based upon local watershed strategies designed to meet the specific needs of each of the 22 Puget Sound Chinook salmon populations within the ESU. The Recovery Plan is comprised of strategies and actions to address habitat impacts, harvest, hatcheries and hydropower factors (“all H’s”) over time. Harvest and hatchery strategies are incorporated into the Recovery Plan from the Puget Sound Chinook Harvest Resource Management Plan (“Harvest RMP”),<sup>1</sup> and the Puget Sound Comprehensive Chinook Salmon Resource Management Plan (“Hatchery RMP”).<sup>2</sup>

In terms of the pace of its implementation, the Recovery Plan lays out long-term (50-year) recovery goals and strategies, but its primary focus is on the first ten years of actions to place the region on a path toward recovery. A 10-year time frame was used as a reasonable period of time to ask for commitments from the various parties working toward recovery and to begin seeing progress and results.<sup>3</sup> A fundamental assumption of the Recovery Plan is that local watershed habitat efforts, coupled with harvest and hatchery actions, will lead the region to recovery.

Both the creation of the Recovery Plan and its implementation are proceeding through voluntary, locally-based efforts that are led by 14 lead entity organizations throughout Puget Sound. The lead entity organizations in each watershed resource inventory area (“WRIA” or “watershed”) are the backbone infrastructure of Recovery Plan implementation in Puget Sound. They consist of a lead entity coordinator who supports a policy leadership group that typically includes local elected officials and representatives from all major stakeholder groups, and a technical group that includes representatives from the various participants in the watershed with special expertise in the scientific fields needed for salmon recovery (e.g., fish biologists, ecologists, engineers, and GIS staff). Together these groups and staff set the watershed’s annual priorities and carry out a number of functions including: working with their partners to develop capital restoration projects and programs in support of the annual work program, screening and ranking projects for funding, coordinating in the regional effort led by the Puget Sound Partnership (“PSP”) in implementing the Recovery Plan as well as the new Action Agenda for Puget Sound, collaborating with other Lead Entities in areas of mutual interest, maintaining the Habitat Work Schedule (a computer database of projects), and preparing updates to the 3-Year Work Program list and narrative for the PSP.

All of this voluntary work to implement the Recovery Plan is being done under the auspices of the PSP, a new state agency, and the successor organization to the Shared Strategy for Puget Sound.

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<sup>1</sup> This Plan was jointly developed in 2004 by the Washington State Department of Fish and Wildlife (WDFW) and Puget Sound Treaty Tribes under Limit 6 of the Endangered Species Act 4(d) Rule for the 2004-2009 fishing years.

<sup>2</sup> Completed in 2004, the Hatchery RMP contains 42 specific Hatchery Genetic Management Plans designed to limit adverse impacts to threatened populations of salmon from hatchery programs and operations.

<sup>3</sup> Puget Sound Chinook Salmon Recovery Plan at pp. 18-19.

## Purpose and Scope of the Project

NMFS is conducting this assessment of progress at the five year mark toward the initial 10-year recovery goals described in the Recovery Plan to gain an understanding about the status and pace of implementation. The results of the investigation will be used to confirm or re-direct Recovery Plan implementation strategies, and identify opportunities to better support Chinook Salmon recovery. The project scope includes an evaluation of progress toward recovery goals for harvest, hatchery, hydropower<sup>4</sup> and habitat (all “H’s”).

This report examines local and regional efforts taken to implement the Recovery Plan since its adoption through the end of 2010, and assesses whether those efforts are resulting in the proposed 10-year trajectory toward recovery. The report describes the wider context within which recovery efforts are happening in Puget Sound, to the extent other issues influence the performance of work under the Recovery Plan. Finally, the report considers the roles of NMFS, the PSP, and implementers at the watershed scale, as well as those persons or groups whose efforts also influence the performance of recovery actions within the ESU.

## Executive Summary

The Recovery Plan was built on several pillars, including habitat protection and restoration, and harvest and hatchery reforms and rebuilding efforts (the “H’s”). It was created using a collaborative model to agree upon voluntary improvements in habitat conditions, and linked to the negotiated agreements involving harvest and hatchery practices, which balanced Chinook salmon recovery needs with well-established Tribal treaty rights. Five years into the effort, this assessment attempts to understand how well those pillars are being implemented, where we find success and where more support, funding or effort is needed to achieve the Recovery Plan’s 10-year goals.

There are reasons to celebrate success across all of the H’s. Although we cannot state them all, a few notable reasons include:

- ✓ The Co-Managers (the WDFW and Puget Sound Treaty Tribes, collectively) met or exceeded the harvest management performance measures required in the 2004 Harvest Management Plan.
- ✓ The WDFW completed its 21st Century Salmon and Steelhead Initiative, which will help them identify, monitor and evaluate long-term, science-based hatchery management strategies.
- ✓ Numerous high priority habitat restoration projects have been accomplished across every watershed in Puget Sound.
- ✓ The Nisqually watershed completed a major portion of their largest project, the Nisqually Refuge Estuary restoration project, with the support and shared contribution of funds from other South Sound watershed groups.
- ✓ The Elwha River Dam removal project is finally funded and scheduled for demolition next year.

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<sup>4</sup>The project does not include a specific focus on hydropower, except to the extent that it is covered under watershed habitat strategies.

- ✓ Despite a severe recession, significant change in the organizational structure supporting Puget Sound salmon recovery, a loss of staff and severe funding shortages, the local commitment to salmon recovery across the ESU remains firm and work is continuing.

As with any undertaking of this scope and magnitude, some adjustments also need to be made to ensure that the effort continues to move toward the 10-year goals set forth in the Recovery Plan. Based on the assessments performed for this report, some conclusions can be stated about the status of Puget Sound habitat, as well as the programs being used to implement the Recovery Plan. Other habitat information is incomplete, which is to be expected at this stage of implementation. Where appropriate, we offer NMFS our recommendations for addressing issues found during the assessment process.

## Key Conclusions and Recommendations

1. **Habitat is still Declining.** Key indicators addressed by the PSP's 2009 State of the Sound Report tell us that important habitat for Chinook salmon is still declining, despite the ESA listing over 10 years ago. As such, the region needs to increase its scrutiny of the sources of habitat decline, and the tools we use to protect habitat sites and ecosystem processes. Habitat status and trends monitoring at the population, major population group and ESU scales is urgently needed and should be a priority focus for funding. In addition, the effects of climate change on the assumptions made in the Recovery Plan needs to be analyzed and discussed across the ESU. Where indicated, new strategies and action should be created to address impacts from climate change.
2. **Habitat Protection Needs Improvement.** The recovery effort is relying heavily on the protection of remaining habitat within the ESU, using a mix of regulatory and incentive programs. As noted above, key indicators show that habitat is still declining. No studies have been performed to analyze the effectiveness of the protection tools described in the Recovery Plan. We note that many of these protection tools are the same ones that have been implemented since the mid-1990s or even earlier, and their existence did not forestall the ESA listing of Puget Sound Chinook Salmon.

In addition, efforts to develop the regional strategies and actions called for in Chapter 6 of the Recovery Plan are largely nonexistent. These include:

- The Protection of Existing Physical Habitat and Habitat-Forming Processes
- The Protection and Restoration of the Nearshore, Puget Sound and Pacific Ocean
- Water Quantity – The Strategy for Achieving and Protecting Instream Flows
- Water Quality Strategies
- Commercial Forestry Strategies
- Commercial Agriculture Strategies
- Research, Monitoring and Adaptive Management

Additionally, local Lead Entities and regional groups such as the PSP or Recovery Council are not advocating for stronger regulatory programs to protect habitat at the federal, state or local level, largely based on socio-political factors. NMFS can help by (a) Defining the necessary level of critical habitat required to ensure the recovery of Chinook Salmon and other listed species across the ESU; (b) Assessing the effectiveness of various protective regulations; (c) Using its legal authority and other tools to ensure that protection programs are being properly implemented and enforced; and that regulatory updates are completed within statutory deadlines, or at a minimum, within a reasonable future time.

3. **Habitat work is underway, but heavily weighted toward capital projects.** Habitat managers within the 14 watersheds are implementing the strategies defined in the Recovery Plan, but at this stage of implementation, the work is heavily weighted toward capital habitat restoration activities. Non-capital programs are just as important for the success of the Recovery Plan, but funding sources tend to favor capital projects, and disfavor the funding of staff necessary to perform the work.
4. **Funding levels are inadequate to fully implement current 3-Year Work Programs.**
  - **Although state and federal funding has steadily increased for implementation, it lags behind what is needed to fully fund the Recovery Plan.** Today, the Lead Entities report having only 20% of the funding they need to complete the habitat capital and non-capital work identified in the 3-Year Work Programs. Currently, the 3-year effort is estimated to cost \$1.1 billion and only \$344 million is available.<sup>5</sup>
  - **Most watersheds report that they are behind the expected pace of implementation** at this 5-year mark, mainly due to a lack of funding and inadequate numbers of staff.
  - **Watershed leaders believe that grant local matching requirements are too rigid and unnecessarily limit their work.** The staff believes that they can do a better job of implementing their programs and projects if they are simply given the funding needed for projects and programs and held accountable for the results. They find that a tremendous amount of their time and energy is now being devoted annually to the bureaucracy that has sprung up around capital and non-capital funding. They also feel pressed by increasing mandates to maintain the 3-Year Work Programs and the Habitat Work Schedule (HWS) and participate in other regional programs. These administrative duties place an increasing burden on staff, which are often overloaded trying to accomplish their substantive work on salmon recovery. Efforts should be made to address these administrative issues.
  - **Staffing for core habitat programs remains insufficient and hampers implementation.** The Lead Entities consistently state that they lack adequate staffing resources to fully implement their Recovery Plans. Most Lead Entity organizations are run with only one or two paid staff. They have identified core staffing needs that include the following staff to ensure all priority programs and projects are timely implemented:

Core Program Staffing Needs:

- Program Director (typically, the lead entity coordinator)
- Program Planner/policy support person (trained in land use planning; develop new strategies, participate in protection programs)
- Restoration/Acquisition Project managers (manage or supervise construction projects, land acquisition negotiations and real estate transactions)
- Outreach and education staff (develop programs and marketing materials, build community relationships and support, lobby opinion leaders and legislators)
- Basic clerical support staff (schedule meetings, take minutes, coordinate work)
- Biologists, ecologist or other technically-trained staff (for project development and review, status/trends monitoring, other field work)

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<sup>5</sup>See, Watershed 3-Year Work Programs, available at [www.psp.wa.gov](http://www.psp.wa.gov).

They also described an additional set of program support services that are very important, but it may be possible to perform these services at the regional scale to provide efficiencies and cost-savings. These services included:

Central Service Needs:

- Group purchasing of supplies and equipment for offices, projects and programs
- Highly skilled meeting facilitators
- Annual design and publishing of marketing and outreach materials
- Grant writers
- Information systems support (technical support to maintain and improve the HWS; and to create and update watershed websites)
- Writers to create stories of success and newsletters for stakeholder engagement;
- Skilled Planners (or access to consultants) to create new habitat protection incentive programs for deployment around the ESU

5. **The Adaptive Management Plan has not been completed. In its absence, there is no process in place to recognize changes that are being made to Recovery Plan strategies as implementation proceeds.**

- Apart from Recovery Implementation Technical Team, (RITT) review, there has been no formal follow up with watersheds that had incomplete plans at the time the Recovery Plan was adopted to acknowledge their completion, and to examine new strategies that have been added as a result of additional research or planning work. Additionally, the HWS and 3-Year Work Program remain the only tools currently available for reporting changes to the original recovery plan strategies. NMFS has not defined the process for updating the Recovery Plan, although it called for the creation of regional and local adaptive management plans as part of the NOAA Supplement to the Recovery Plan. Given that NMFS expects the Recovery Plan to be adapted over time, NMFS should expedite completion of the adaptive management framework under development by the RITT and work with the watersheds to determine the best process for documenting changes in Recovery Plan implementation.
- Additionally, efforts that began five years ago to create the regional framework for the Adaptive Management Plan for the Recovery Plan appear to have ceased at the end of 2007. NMFS should ensure that the regional framework for adaptive management is completed as called for in the Supplement to the Recovery Plan. Additionally, the Lead Entities are being held responsible for creating local adaptive management plans that will fit within the larger regional framework when it is completed. But, the necessary funding and support to engage in this work has not been provided to them by the region or NMFS, which is frustrating to many watershed staff.

6. **The Harvest RMP is being implemented as planned.** NMFS is presently analyzing the new RMP and expect to release information in the next few months which will update the information presented here. In the meantime, it appears from available information that the harvest limits established in the Harvest RMP have been followed for all 22 populations since its adoption. In terms of the performance of the population under the Harvest RMP, total natural escapements for 11 of 19 populations (and one management unit for which there are rebuilding thresholds), met or exceeded the established thresholds from 1999-2008.<sup>6</sup> In terms of the level of effort expended in

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<sup>6</sup>Per Susan Bishop, NMFS, (September 2010). Additional information analyzing the new RMP is expected to be released within the next few months. That information will update and in some cases, may change, the information presented here.

implementing the Harvest RMP Plan, the Co-Managers have implemented a significant amount of monitoring and reporting, and this work is on-going each year. Canadian and Alaskan harvests continue to account for a substantial proportion of harvest for many Puget Sound Salmon, but the harvest is consistent with the terms of the 2008 Pacific Salmon Treaty Annex. As the timeframe of the initial Harvest RMP comes to a close, work is now underway to renegotiate the Harvest RMP Plan between NMFS and the Co-Managers.

7. **The Hatchery program within NMFS is critically under-resourced.** As discussed below, over 100 *Hatchery and Genetic Management Plans* (HGMPs) are still awaiting review and approval by NMFS. This limits the implementation of the Hatchery RMP. Additional staff should be added to this program to ensure that the ESA and NEPA goals of the Hatchery RMP can be accomplished in a timely way.
8. **H-integration and sequencing of various efforts remains challenging** to implement and requires more resources for all necessary parties to participate, including support from the RITT members.

## II. Assessment Methodology

The report presents both a qualitative and quantitative statement about the status of implementation of the Recovery Plan through the end of 2010, across each of the 14 watersheds and nearshore areas that make up the Puget Sound ESU.<sup>7</sup> Recognizing that it is still early in the region's work under the Recovery Plan, the report examines what can be said about the status of implementation activities so far, in light of the Recovery Plan's 10-year goals. As a snapshot in time, the report attempts to identify the current status of habitat and the factors that make up the Viable Salmonid Population (VSP) criteria established by the NMFS Technical Recovery Team (TRT). The overall questions sought to be answered by this Report are: (1) Are the recovery strategies being implemented as described in the Recovery Plan?; and (2) Is the work proceeding at the expected pace toward 10-year goals?

To answer these questions we evaluated the following:

- All major elements of implementation of recovery strategies found in the Recovery Plan (*all H's*) within each of the 14 watershed and nearshore areas;
- The implementation of required updates or additions to strategies, as described in NMFS's Supplement to the Recovery Plan; and
- The degree to which strategies and actions across the various H's have been integrated for each population.

In order to gauge the status of implementation, we gathered available information about each of the Harvest, Hatcheries and Habitat elements of the Recovery Plan.<sup>8</sup> The specific information and criteria used to evaluate each component of implementation is described below.

### Habitat Plan Assessment Criteria

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<sup>7</sup>The assessment report is not a technical assessment about the scientific underpinnings of the recovery assumptions that were made in creating the Recovery Plan.

<sup>8</sup> Other NMFS listing factors which must be addressed for recovery were not analyzed as part of this Report.

For the habitat component of the Recovery Plan, a set of objective reporting standards does not yet exist to evaluate the performance of implementation efforts.<sup>9</sup> Accordingly, the assessment used both qualitative and quantitative measures to evaluate and report on the status of actions designed to protect and restore habitat important for recovery. Where available, the assessment was based on objective data, but it also considered self-reported progress and observations from key leaders who are working on the Recovery Plan at both the regional and local scales.

We examined the commitments made in the Recovery Plan, gaps identified by the TRT and its successor, the RITT, and the NMFS Supplement to the Recovery Plan. We compared that information to the watershed 3-Year Work Programs from 2008, 2009 and 2010, as well as the Habitat Work Schedule, and other local work program or guidance documents that describe implementation efforts. Using this information, habitat actions were assessed against the criteria listed below.

For the habitat actions in each watershed, we examined qualitative performance indicators to determine whether implementation is on track, including:

- Whether a responsible party has been identified for each of the actions listed under a given strategy in the Recovery Plan (responsible for leading, implementing, tracking and reporting on the actions being taken in furtherance of the Recovery Plan)
- Whether strategies in the Recovery Plan are being pursued through the implementation of prioritized actions, as reflected in the 3-Year Work Programs
- Whether the watershed has adopted a monitoring and adaptive management plan
- Whether major obstacles exist or are known that pose a risk to any specific set of strategies.<sup>10</sup>

In addition, we used certain quantitative measures to determine whether habitat implementation was on track, including:

- Whether high priority strategies identified in the Recovery Plan are included in the 3-Year Work Program and are being implemented
- Whether an adequate amount of funding is available for the work
- The total number of actions underway and projected completion dates
- Whether gaps or incomplete items identified in either the Recovery Plan, the Supplement to the Recovery Plan or by the TRT (or RITT) are being actively worked on and have a reasonable plan for completion.

Finally, we performed additional research using public information sources (federal, state and local government sources, the on-line “Habitat Work Schedule,” and individual watershed websites). We interviewed key staff from each watershed and from the regional organization to gain a better understanding of each watershed’s programs and activities and to verify report findings prior to finalizing them. In some watersheds, interviews also included key stakeholders and technical team members.

Using this information, a watershed profile, summary report and assessment table was created for each of the 14 watersheds within Puget Sound ESU. From this work, information and data was

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<sup>9</sup> A framework for monitoring the progress of implementation, ESU habitat status and trends, and the effectiveness of recovery strategies was suggested in the Shared Strategy’s *Draft Monitoring and Adaptive Management Plan dated October 31, 2007* for all H’s. It is our understanding that additional work is underway on the regional adaptive management plan, but remains incomplete at this time.

<sup>10</sup>(See, e.g., the US Army Corps of Engineers proposed change to their Levy Vegetation Policy; or the effects of global climate change on recovery strategies).

aggregated and key messages were identified for the final report and recommendations. Watershed profiles, assessment summaries and tables are presented for each watershed in Appendix A.

## Harvest RMP Assessment Criteria

Harvest actions designed to contribute to Puget Sound Chinook Salmon recovery are defined in the Harvest RMP. It is being implemented by the Co-Managers (Puget Sound Tribes and the WDFW) throughout Puget Sound. The implementation of strategies and actions are tracked and evaluated annually in the Post-Season Harvest Report. The sources used to analyze harvest performance under the Harvest RMP included the Post-Season Harvest Report, Annual Report Covering the 2009-2010 Fishing Season, the Co-Manager's Harvest Management Performance Measures presentation to the Salmon Recovery Council (2010), and interviews with NMFS Staff.<sup>11</sup>

The assessment of Harvest RMP implementation efforts is based on the 2004-2008 timeframe. The criteria used to assess whether implementation is occurring as identified in the Harvest RMP include the following benchmarks, derived from the Harvest RMP itself (and suggested in Tables 1 and 2 of Volume III of the Shared Strategy's *Draft Monitoring and Adaptive Management Plan* dated October 31, 2007):

Core Strategy 1: Ensure sufficient spawners to maintain stability of all populations based on current habitat conditions and productivity

Suggested Benchmarks:

- All 22 populations in the ESU are protected by fishing exploitation rate (ER) ceilings based on abundance and natural productivity thresholds;
- Total fishery mortality (landed catch and non-landed mortality) is accounted for each year;
- Population abundances are predicted each year that incorporate the best estimates of uncertainty (measurement error, management error, and population variability);
- Escapement assessed annually;
- Technical tools for assessing fishery mortality are improved with new information;
- Technical tools for assessing population abundance, productivity, and diversity are improved with new and better information;
- Enforce fishery rules and regulations; and
- Evaluate effectiveness of regulations.

Core Strategy 2: Allow populations to rebuild as other constraining factors are alleviated by limiting mortality rates on individual populations to levels that are consistent with achieving ESU viability.

Suggested Benchmark:

- Identify Recovery Exploitation Rates (RERs) for all populations<sup>12</sup>

Core Strategy 3: Provide harvest opportunity on other species while rebuilding the ESU

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<sup>11</sup>The consultant's analysis was confirmed using NMFS's harvest performance analyses set forth in the draft report, "Bishop, S., Preliminary Review of Status of Puget Sound Chinook Populations, Exploitation Rates, Catch and Sampling under the 2004-2008 RMP."

<sup>12</sup>RERs may be developed by a variety of analyses. As used here, total RERs refer to rates developed by using CWT data to quantify total mortality and spawning ground escapement and age information to develop spawner-recruit relationships.

Suggested Benchmark:

- Fishing opportunities occur for other Pacific salmon species while preventing further declines of Chinook populations due to harvest

Core Strategy 4: Adhere to the principles of the Puget Sound Salmon Management Plan (PSSMP) and other legal mandates pursuant to *U.S v Washington* and the terms of the Pacific Salmon Treaty (PST) and its annexes.

Suggested Benchmark:

- Harvest management occurs as a government-to-government process among Tribal, state, and federal managers
- Annual fishing regime is established each year following procedures in PSSMP
- Preseason forecasts and management agreements occur annually
- In-season modifications of harvest regulations follow procedures specified in PSSMP
- U.S. and Canada manage fisheries consistent with the terms of the PST annexes.

## Hatchery RMP Assessment Criteria

Hatcheries in Puget Sound are managed pursuant to the legal framework established from the *U.S. v. Washington*<sup>13</sup> decision, which led to the adoption of the PSSMP. As a part of the PSSMP, the WDFW and Puget Sound Treaty Tribes (collectively known as the “Co-Managers”) operate hatcheries according to the PSSMP “tools”:

- (1) A set of descriptions of standard modes of operating hatchery programs developed under regional planning by the Co-Managers (equilibrium brood documents and equilibrium brood programs);
- (2) Annual descriptions and review of the operating objectives and changes from the standard program that can be used for annual planning (Future Brood Document and Co-Managers’ Fish Disease Policy);
- (3) Regional management plans to coordinate Co-Manager activities and priorities;
- (4) Exchange of technical information and analyses through coordinated information systems; and
- (5) Dispute resolution.

The PSSMP pre-dated the ESA listing of Puget Sound Chinook Salmon, and many of its tools were updated to meet the needs of hatchery reform identified by the Hatchery Scientific Review Group (HSRG) process, a panel of independent scientists charged by the U.S. Congress with promoting hatchery reform, and to respond to the ESA listings of various salmonid species.

Based on this framework, the parties to *U.S. v. Washington*, with the NMFS, developed the Puget Sound Chinook Salmon Hatcheries Plan (PSCSH) (March, 2004), jointly as part of the Comprehensive Chinook Salmon Management Plan, which identifies interim goals for harvest and hatcheries. The plan describes the scientific foundation and general principles for evaluating artificial production programs and for continued hatchery reform. It builds on a biological assessment of tribal hatchery programs submitted

<sup>13</sup>*U.S. v. Washington*, 759 F.2d 1353, 1360 (9th Cir., en banc), *cert.denied*, 474 U.S. 994 (1985).

to NMFS by the Bureau of Indian Affairs (BIA) in October, 1999, as required by section 7 of the ESA, and incorporates management alternatives subsequently developed by NMFS and the Tribes. It also draws from the recommendations of the HSRG. The PSCSH Plan has four overall strategies for threatened salmon:

- (1) Protect and recover indigenous populations of salmon in watersheds where they still occur (Recovery Category 1 watersheds);
- (2) Implement management actions that use the most locally adapted stock to reestablish and sustain natural production in watersheds that no longer have indigenous populations, but where natural production is possible given existence of suitable or productive habitat (Recovery Category 2 watersheds);
- (3) Manage watersheds that historically may not have supported self-sustaining, naturally spawning populations for hatchery production, when desired, while maintaining habitat for other species that are supported by these watersheds (Recovery Category 3 watersheds); and
- (4) Protect treaty rights by providing fish for harvest.

In addition to these overall strategies for ESA-listed salmon, the PSCSH Plan adopted several general principles that govern the hatchery programs in each watershed:

- Hatchery programs need clearly stated goals, performance objectives, and performance indicators.
- Hatchery programs need to coordinate with fishery management programs to maximize benefits and minimize biological risks so that they do not compromise overall plans to conserve populations.
- Priorities for brood stock collection of listed fish depend on the status of the donor population, relative to critical or viable population thresholds. Highest priority for brood stock collection of listed populations below the viable threshold is conservation. Brood stock collection for other priorities depends on meeting the conservation goals and not appreciably slowing recovery to viable levels.
- Hatchery programs need protocols to manage risks associated with fish health, brood stock collection, spawning, rearing, and release of juveniles; disposition of adults; and catastrophes within the hatchery.
- Hatchery programs need to assess and manage the ecological and genetic risks to natural populations.
- Hatchery programs must have adequate facilities and maintenance to rear fish, maintain fish health and diversity, and minimize domestication in fish of naturally spawned brood stock.
- Hatchery programs should be based on adaptive management, which includes having adequate monitoring and evaluation to determine whether the program is meeting its objectives and a process for making revisions to the program based on evaluating the monitoring data.
- Hatchery programs must be consistent with the plans and conditions identified by Federal courts with jurisdiction over tribal harvest allocations.

- Hatchery programs will monitor the “take” of listed salmon occurring in the program and will provide that information as needed.

Based on the PSCSH Plan, the Co-Managers have created 46 separate *Hatchery and Genetic Management Plans* (HGMP) in five major geographic regions of Puget Sound (Strait of Juan de Fuca, North Sound, Mid Sound, Hood Canal, and South Sound). The salmon stocks in each hatchery are managed for one or more purposes: “integrated,” “isolated,” “harvest,” “recovery” and/or “research.” In addition to meeting stated release goals, each HGMP sets forth operational commitments that the Co-Managers have agreed to meet for each hatchery, depending upon its management status.<sup>14</sup>

Ideally, each of the HGMPs operating under the Hatchery RMP would be analyzed for implementation progress according to each of their component parts. With regard to the Puget Sound HGMPs, however, this was not possible for the reasons described in the Hatchery Assessment Results Section, below.

### III. Assessment Findings

#### A. The Effect of Recovery Work on Salmon Habitat and Chinook Populations

While it is important to recovery to assess how well the region is doing in implementing the Recovery Plan, it is equally important to assess the effect that the implementation of those strategies and actions may be having on habitat critical for recovery, as well as the effect of those actions on the Chinook population, itself. To do this in a meaningful way requires consistent and widespread status and trends monitoring. That isn’t happening across Puget Sound at this time. As noted above, a framework for monitoring status and trends was suggested in the Shared Strategy’s *Draft Monitoring and Adaptive Management Plan* (2007), but a framework has not yet been completed and implemented at the regional and watershed scales.

Accordingly, there is no framework defining the indicators that should be monitored to report on habitat status and trends specific to the Recovery Plan.<sup>15</sup> In the absence of agreed upon indicators, we examined the status of certain habitat indicators set forth in the *2009 State of the Sound Report, Ecosystem Status and Trends* published by the PSP in order to assess whether the region’s efforts at recovery have had a detectable effect on habitat or salmon populations.

Clearly, gaps in our scientific understanding of ecosystem processes and the absence of an ESU-wide habitat status and trends monitoring program, limit our ability to make a statement about habitat status at the present time. In the absence of that information, we defer to the analysis and conclusions presented in the PSP’s most recent *State of the Sound Report*, which analyzed the condition of various habitat types.

### The Status of Puget Sound Habitat

#### Forest Cover and Habitat Complexity

<sup>14</sup>Source: Tim Tynan, NOAA Fisheries Service, 2010

<sup>15</sup>However, the Governor’s Forum on Monitoring has published the Washington Comprehensive Monitoring Strategy and Action Plan for Watershed Health and Salmon Recovery (December, 2002). See, [www.rco.wa.gov](http://www.rco.wa.gov) for more information.

Selective findings from the PSP's *State of the Sound Report* include:

- ✓ The Puget Sound basin has experienced substantial loss and degradation of native ecosystems types over the last 150 years. Much of the activity has occurred in the Puget Lowlands (below 1000 ft. elevation), to provide living space (houses and associated infrastructure) for people.
- ✓ Since statehood in 1889, Washington has lost an estimated 70% of its estuarine wetlands, 50% of its riparian habitat, and 90% of its old-growth forest. Together, these native habitat types have been considered among the most diverse and productive in the State.
- ✓ Land development is a major determinant of the extent and condition of Puget Sound habitats. Most development continues to occur in the Puget Sound Lowlands but is not limited to relatively undisturbed lands. Agricultural lands also appear to be declining in support of more intensive land uses. In addition to development, climate change, pollution and non-native species will also affect habitat quality and quantity in the region.<sup>16</sup>
- ✓ From 2001 to 2006, the amount of developed land in Puget Sound increased about 3%, with nearly two-thirds of that land being converted to impervious surfaces. This translates into a loss of about 10,700 acres of forest types and 4,300 acres of agricultural land over the five-year period. This period was *after* the ESA listing of Puget Sound Chinook Salmon.
- ✓ As of 2006, approximately 25% of the Puget Lowlands was in urban use and agriculture. Some ecosystem types, particularly those in the lowlands and along riverine and marine shorelines, have experienced more change than others. Less obvious are changes in the conditions of habitat. Much of the old forest that dominated the region in the early 1900s has been converted to younger commercial forests, which will be logged again in the future.
- ✓ From 1988-2004, Western Washington forest lands have declined by 25%, a loss of 936,000 acres of State and private forest land. These losses (meaning conversion to other uses), were the result of changes in markets conditions for wood products, changes in land ownership, impacts from competing land uses and the health of timber stock. Recent research from the University of Washington indicates that nearly one million more acres of private forestland are threatened with conversion. Across all of Washington, the potential risk of conversion is highest in the Puget Sound region.<sup>17</sup>

Shown in Figures 1 and 2 below<sup>18</sup>, consistent conclusions were found when the PSP examined the rate of land use conversions and increases in impervious surfaces across Puget Sound from 2001-2004, which grew from 2%-3%.<sup>19</sup> This habitat loss is added to the existing background of land disturbance and development across Puget Sound. The numbers show a disturbing trend of continuing loss despite the

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<sup>16</sup>Puget Sound Partnership. 2009. Ecosystem Status and Trends, State of the Sound Report, p. 67.

<sup>17</sup>Id. See, 2006 Western Washington Land Use Change Dataset ©2009 University of Washington.

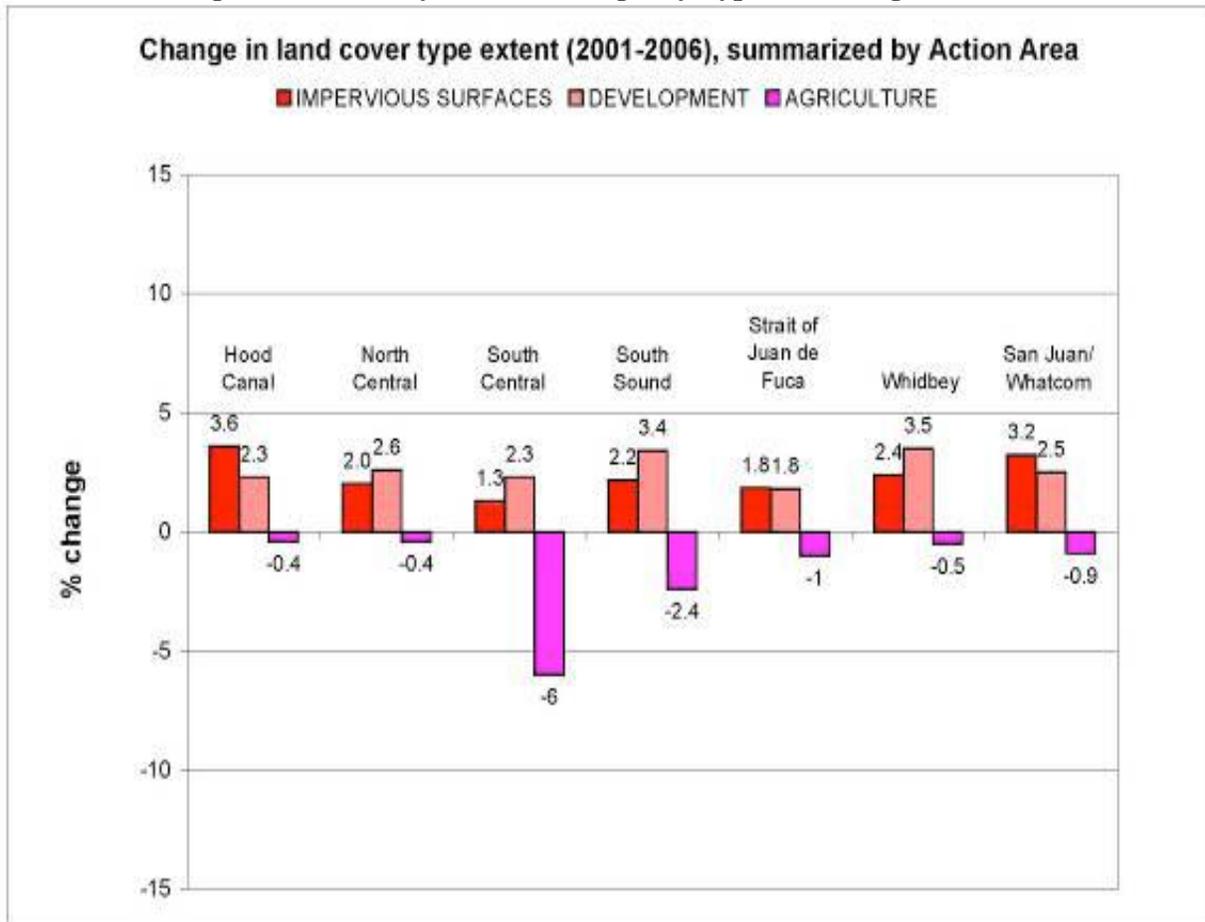
<sup>18</sup>Puget Sound Partnership. 2009. Ecosystem Status and Trends, State of the Sound Report

<sup>19</sup>Puget Sound Partnership. 2009. Ecosystem Status and Trends, State of the Sound Report, p. 67.

State’s adoption of some of the most aggressive land management tools in the Nation, including the Shoreline Management Act (SMA), Growth Management Act (GMA), Critical Areas Regulations (CAR) and the Forest and Fish Agreement, which led to changes in the Forest Practices Act to protect Salmon.<sup>20</sup>

**The data shows a disturbing trend of continuing loss of habitat, despite our State’s adoption of some of the most aggressive land management tools in the Country.**

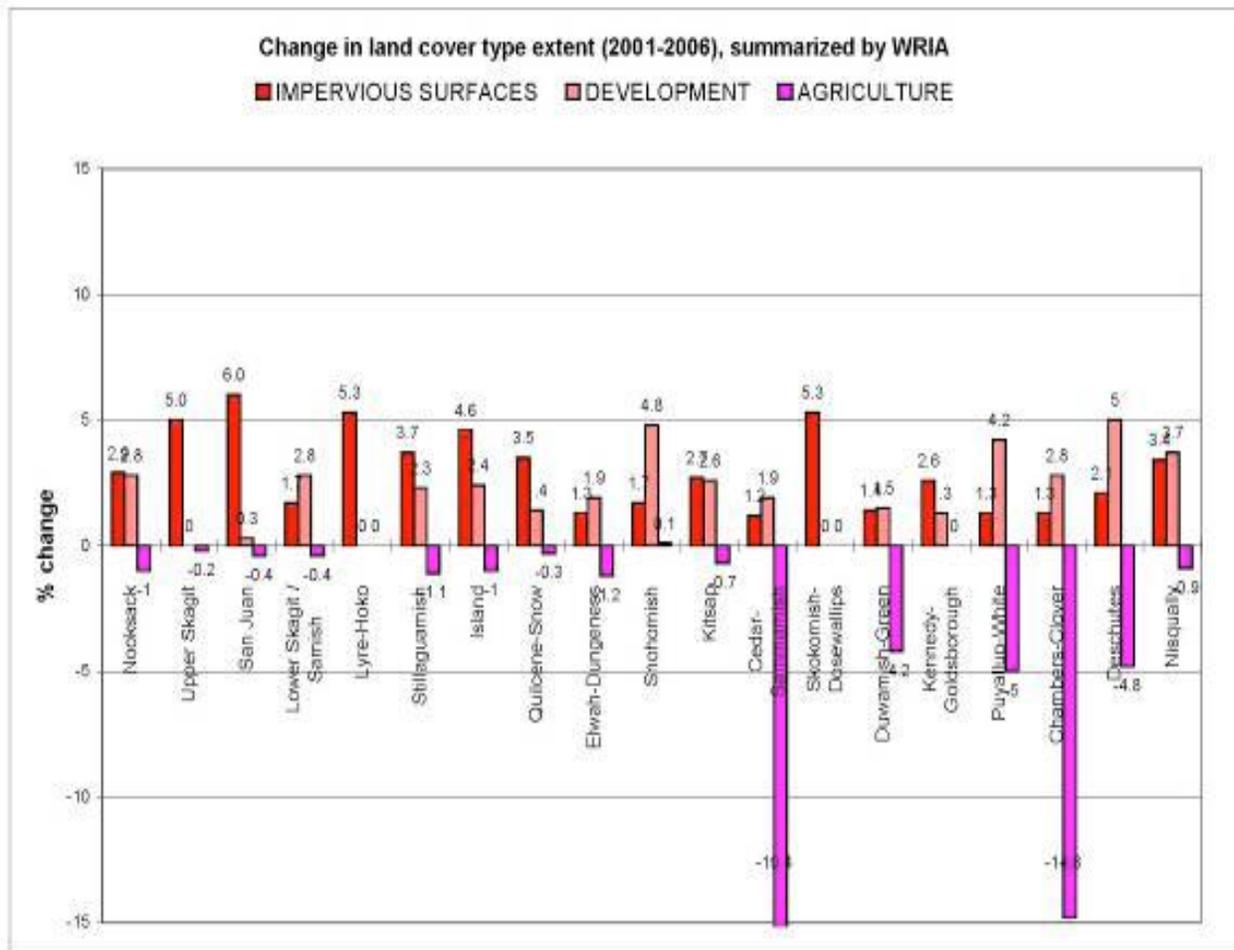
**Figure 1. Summary of Land Changes by Type across Puget Sound<sup>21</sup>**



<sup>20</sup> See, Chapter 36.70A RCW; Ch. 76.09 RCW

<sup>21</sup>The increases in developed land and impervious surface were fairly consistent across the Action Areas, ranging around 2%-3%. However, the San Juan and Hood Canal Action Areas had greater increases in impervious surface than development. This suggests that open/natural areas within existing developed land experienced further development into impervious surfaces, possibly within Urban Growth Areas (UGA). Agricultural land decreased from about 1%-6%, with the 6% loss within the South Central Puget Sound Action Area.

**Figure 2. Changes in Puget Sound Land Cover Type and Extent by Watershed**



Since the 1990s and continuing into this decade, scientists studying the effects of increasing effective impervious areas (EIA) and decreasing forest cover in Puget Sound watersheds (“urbanization”), have consistently sounded the alarm on the damage it causes to watershed health:

In the realm of physical channel conditions, the data collected from field observations have consistently shown remarkably clear trends in aquatic-system degradation. In this region, approximately 10% effective impervious area in a watershed typically yields demonstrable degradation, some aspects of which are surely irreversible. Although early observations were not sensitive enough to show significant degradation at even lower levels of urban development, the basin plans of the early 1990’s recognized that such damage was almost certainly occurring. More recently, biological data (*e.g.*, Morley, 2000) have demonstrated the anticipated consequences at these lower levels of human disturbances. . . .

Hydrological analyses suggest that maintaining forest cover is more important than limiting impervious-area percentages, at least at rural residential densities where zoning effectively limits the range of EIA between 2 and 6 percent of the gross development area. . . . [However,] hydrologically and biologically, there are no truly negligible amounts of clearing or watershed imperviousness (Morley, 2000), even though our perception of, and our tolerance for, many of the associated changes in downstream channels appear to undergo a relatively abrupt transition. Almost every increment of

cleared land, and of constructed pavement, is likely to result in some degree of resource degradation or loss.<sup>22</sup>

Scientists now know that managing the effects of urbanization for the protection of riparian habitat is complicated, and does not lend itself to the one-size-fits-all treatments that most regulatory schemes provide. As one group of researchers said:

... [U]rbanization does not affect all streams the same way. The degree of urbanization and the specific complex of activities characterizing local development differ for each stream. . . . [A]ny effort to manage a specific stream must relate stream biological condition to specific human activities and their effects in that watershed. Not doing so is akin to prescribing a cure for an ill person without identifying his symptoms or looking for their likely causes.<sup>23</sup>

Beyond forest cover, impacts to the complexity and functioning of riparian and nearshore habitats have also been measured, shown through intertidal wetland loss, loss of natural shoreline function, shoreform alteration, and changes in eelgrass beds.

### **Intertidal wetlands**

In its 2009 *State of the Sound Report*, the PSP found that intertidal wetlands are one of the Puget Sound habitat types most threatened by human activities:

Locally, development pressures associated with a growing human population in the Puget Sound basin and the maintenance of a viable economy threaten the extent and quality of intertidal wetland habitats. Globally, warming of the atmosphere is driving local changes that impact intertidal wetlands such as changes in sea level, frequency and severity of habitat-shaping storms, volume and timing of freshwater input, and changes in water temperature and nutrient cycling. To understand changes in these critical habitat types and to begin to prioritize management actions, the Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) recently completed an intertidal change analysis.<sup>24</sup>

PSNERP's study revealed dramatic losses in all but one place in Puget Sound in the last 150 years. Much of this loss is attributed to the legacy of European settlement of the region, which was focused on development of the waterways for economic development. They found that the "loss of intertidal wetlands contributed to the decline of Chinook salmon, which in turn may be affecting other food web elements such as Orca and other marine mammals."<sup>25</sup>

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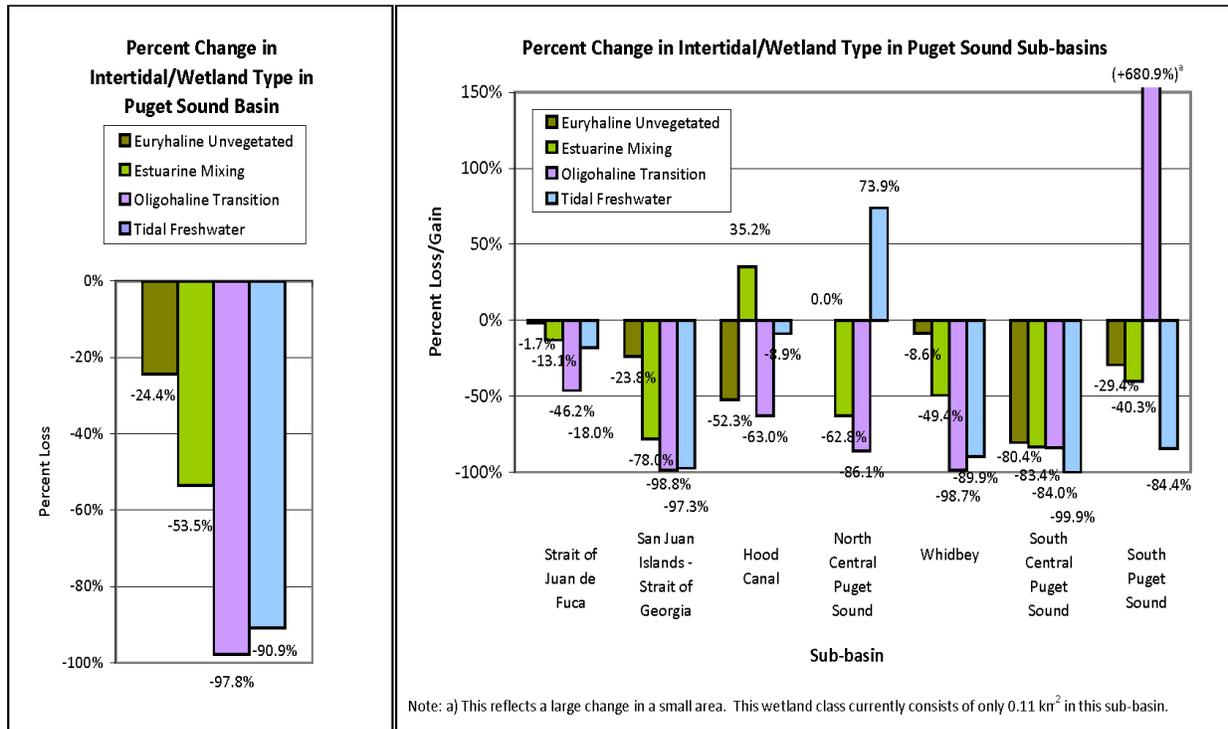
<sup>22</sup>(Emphasis Added). Booth, D.B, D. Hartley, R. Jackson, Forest Cover, Impervious Surface Area, and the Mitigation of Stormwater Impacts. *Journal of the American Water Resources Association*, v. 38:835-845 (2002).

<sup>23</sup>Booth, D. B., J.R. Karr, S. Schauman, C.P. Konrad, S.A.Morley, M.G. Larson and S. J. Burges. In Press. Reviving Urban Streams: Land Use, Hydrology, Biology, and Human Behavior. *Journal of the American Water Resources Association*.

<sup>24</sup>Puget Sound Partnership, *State of the Sound Report, Ecosystem Status and Trends* at pp 80-82 (2009).

<sup>25</sup>Id.

**Figure 3. Intertidal Wetland Change, 1850s-2006 in Puget Sound Basin and Subbasins<sup>26</sup>**



## Shorelines and Nearshore Areas

Shorelines and nearshore areas across Puget Sound have also been impacted by human activities. PSNERP concluded that the shoreline of Puget Sound is shorter now (2000-2006) than it was historically (1850s-1890s), reflecting a simplification of its complex geology.<sup>27</sup> Total shoreline length of all shoreforms combined declined by approximately 15% Sound-wide, and the composition of geomorphic shore types has changed with significant gains in artificial (primarily nearshore fill) and losses in delta and embayment (barrier estuaries, barrier lagoons, closed lagoon marshes, and open coastal inlets) shore types. Shoreform change has been dominated by either a transition to artificial or the complete disappearance as a recognizable shoreform (i.e. filling a lagoon).<sup>28</sup>

## Eelgrass Areas

The health of eelgrass beds in the Puget Sound nearshore are an indicator of the health of nearshore areas. In the *State of the Sound Report*, the PSP noted:

Eelgrass is the dominant sea grass in Washington. It grows in tidelands and shallow waters along much of Puget Sound's shoreline. Eelgrass serves as a haven for many fish and wildlife species, providing them with food, breeding areas and protective nurseries. Because eelgrass habitat supports intricate food webs and diverse fauna, it plays a critical role in the health of Puget Sound. Eelgrass is a valuable indicator of estuarine health not only because of the ecosystem functions it provides, but because it is known to be

<sup>26</sup> Puget Sound Partnership, *State of the Sound Report, Ecosystem Status and Trends* (2009).

<sup>27</sup> Id. at 83.

<sup>28</sup> Id.

sensitive to environmental stressors. Excess nutrients, sewage and algae can reduce water clarity while storms, runoff and dredging can stir up sediment, preventing light from penetrating the water and reaching the eelgrass. Boat wakes, propellers and docks can also disturb eelgrass beds. Also, since eelgrass is protected by many regulations, its condition reflects, in part, the success of management actions.<sup>29</sup>

In terms of the quantity and distribution of eelgrass, the PSP found that there are 50,000 acres of eelgrass in greater Puget Sound. It is found along approximately 43% of Puget Sound shoreline.<sup>30</sup> Eelgrass commonly occurs in two different habitats — narrow beds that parallel the shoreline (“fringe” beds), and broader beds within bays (“flats”). Over 25% of all Puget Sound eelgrass is found in two expansive embayments: Padilla and Samish Bays in Skagit County.

The PSP found that an overall pattern of slight decline has been detected on smaller sites in seven out of eight years since monitoring began in 2000. The number of sites with significant annual declines has outnumbered those with increases every year in seven out of the last eight years. Sites with long-term declines also outnumber sites with long term increases. The regions of greatest concern for eelgrass losses are Hood Canal, and the San Juan Islands.<sup>31</sup> The PSP concluded:

The observed eelgrass declines could reflect increased environmental stressors, such as excess nutrients, runoff, boat damage, docks, algae blooms and climate change. Because it is protected by many regulations, eelgrass condition reflects, in part, the success of management actions. Observed decreases suggest that there may be gaps in regulatory protections or their implementation.<sup>32</sup>

## **Water Quality**

As an important indicator of the human and ecosystem health, water quality is measured against Washington’s Water Quality Standards (*See*, Ch. 90.48 RCW; Ch. 173-200 WAC and Ch. 173-201A WAC). Water quality monitoring is on-going across Puget Sound for varying pollutants and chemical contaminants, some in response to the National Pollutant Discharge Elimination System (NPDES) permits issued under the Federal Clean Water Act. But, gaps in monitoring data remain. Given the limitations of this Report, we do not attempt to characterize the current state of water quality in Puget Sound. For more information on the Department of Ecology’s Environmental Assessment Program, and in particular Status and Trends Statewide Monitoring Framework, see their website at: <http://www.ecy.wa.gov/programs/eap/stsmf/index.html>. Additional information may be found in the 2009 *State of the Sound Report* published by the PSP.

## **Conclusions about the Status of Habitat within the ESU**

The status and trend data summarized above reveals habitat losses across many indicators when compared against both historical data, and even since the ESA listing of Puget Sound Chinook Salmon. A fundamental assumption of the Recovery Plan is that it must result in habitat protection. “Protection is

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<sup>29</sup> Id. (Eelgrass data and analysis provided to the PSP by *Helen Berry, Jeff Gaeckle, Pete Dowty and Tom Mumford, Washington Department of Natural Resources*).

<sup>30</sup> Id.

<sup>31</sup> Further information is available in the annual monitoring report:

[http://www.dnr.wa.gov/ResearchScience/Topics/AquaticHabitats/Pages/aqr\\_nrsh\\_eelgrass\\_monitoring.aspx](http://www.dnr.wa.gov/ResearchScience/Topics/AquaticHabitats/Pages/aqr_nrsh_eelgrass_monitoring.aspx)

<sup>32</sup> Id. At pp. 86-89.

needed at the individual habitat site as well as at the ecosystem scale to ensure the processes that create habitat continue to function.”<sup>33</sup> The TRT stated:

The Puget Sound TRT finds that protecting existing habitat and the ecological processes that create it *is the most important action needed in the short-term* to increase the certainty of achieving plan outcomes. Protection must occur in both urban and rural areas if we are to ensure the long-term persistence of salmon in Puget Sound.<sup>34</sup>

(Emphasis added). The key indicators addressed by the PSP’s 2009 *State of the Sound Report* tell us that habitat losses continue; that increased scrutiny on the sources of decline and the tools we use to protect habitat sites and ecosystem processes is warranted, and likely urgent. Additional monitoring of habitat status and trends within each watershed is an important need that generally has not been agreed to or funded at any significant level to date. As the Recovery Plan itself states, the success of the Recovery Plan depends on it. Accordingly, we recommend that immediate efforts be made to complete the monitoring and adaptive management plan and to fund status and trends monitoring across the ESU and within each watershed.

## Chinook Population Status and Trends

In addition to examining the state of habitat across the Puget Sound ESU, we also attempted to assess the current status of the Puget Sound Chinook population. For the 22 Chinook populations within the ESU, NOAA established the viable salmonid population criteria (VSP) prior to the completion of the Recovery Plan:

NOAA Fisheries defines viability as a 0.95 probability of population persistence over a 100-year time frame. Four main population parameters—abundance, productivity, spatial structure and diversity—describe the attributes of a viable population. The abundance and productivity attributes are estimated through quantitative population models; spatial structure and diversity of viable populations are described more qualitatively. Population viability has been determined using two methods: one assuming density independent returns from spawners and the other using density dependent functions.<sup>35</sup>

For each of those VSP parameters, the TRT suggested the following indicators be used:

**Table 1. VSP Data Indicators established by the Puget Sound TRT.**

Monitoring Data to Determine Viable Salmonid Populations (VSP)	
VSP Parameter for Puget Sound Chinook Salmon Populations	Indicators
Abundance	Use adult salmon counts (and juveniles where possible) to assess abundance for each wild population.
Productivity	Use ratio of adult recruitment per spawner (and juvenile production per spawner where possible) to assess productivity.
Spatial Distribution	Use spatial distribution of natural origin spawners to assess spatial distribution.
Diversity	Use relative frequencies of different life history types to assess diversity.

<sup>33</sup>Puget Sound Chinook Salmon Recovery Plan at p. 353.

<sup>34</sup>Id. at p. 354.

<sup>35</sup>Sands, N.J., K. Rawson, K.P. Currens, W. H. Graeber, M.H. Ruckelshaus, R.R. Furstenberg and J.B. Scott. 2007. Draft Dawgsz N the Hood, the Hood Canal Summer Chum Salmon ESU. U.S. Dept. Commer., NOAA, NWFSC.

NOAA is currently conducting a 5-year status review under the ESA for the 22 populations of Puget Sound Chinook Salmon. The results of that review will provide the broader status report for the entire ESU on all VSP factors. Until that status review is complete, we can report on one of the factors listed: Abundance.

## **Conclusions about Chinook Population Abundance**

Using Puget Sound TRT guidance and reporting metrics, we examined whether data trends show positive improvement toward the target ranges established in the Recovery Plan. For the abundance parameter, NOAA's Northwest Fisheries Science Center ("NWFSC") recently published its analysis of 1999-2008 Abundance Trends for Puget Sound Chinook Salmon Populations, using information compiled from state and tribal sources using the methodologies developed by the NWFSC Technical Recovery Teams ("TRT").

NMFS concluded that over the 10-year period, only the Lower/North Fork/Middle Fork Nooksack, Cedar, and White Rivers showed an "increasing" abundance trend out of 22 populations. The South Fork/Mainstem Stillaguamish River showed a "decreasing" trend over the same period. The remaining 18 populations showed no trend change.<sup>36</sup>

NMFS found that trends in escapement are positive for most populations while trends in growth rate are declining for most populations in the ESU, although many are close to 1.0.<sup>37</sup> The highest escapement trends were observed in the NF Nooksack, White and Dungeness river populations. The lowest escapement trends were observed in the Stillaguamish and Puyallup river populations. Both escapement trends and growth rates are declining in Suiattle, North Fork Stillaguamish, South Fork Stillaguamish, Puyallup and Mid-Hood Canal populations.<sup>38</sup>

Unfortunately, NMFS data shows that the region's ability to accurately predict abundance numbers in any given year using current methods appears to be fairly poor. In the same study cited above, NMFS found that pre-season forecasts generally overestimated abundance levels for the 2001-2007 returns by substantial margins, many by over 50%.<sup>39</sup> Accordingly, it will continue to be important to refine forecasting methods and models, and to approach all-H recovery strategies using precautionary principles.

## **B. Assessment of Implementation by All H's under the Recovery Plan**

### **Results of Hatchery RMP Assessment**

The Hatchery Management Plan created an implementation structure within HGMPs would be created within each population and submitted for approval to NMFS. This review and approval step is a condition precedent to a hatchery receiving protection from liability for "take" of Chinook Salmon under the ESA that might occur as a result of hatchery operations. Over the last six years, NMFS has received 114 HGMPs for review and approval, describing all anadromous salmon and steelhead hatchery programs operated by the WDFW, the 16 Puget Sound Treaty Tribes, and the USFWS in the Puget Sound region.

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<sup>36</sup>See, <http://www.nwfsc.noaa.gov/>

<sup>37</sup>Bishop, Susan. *Preliminary Review of Status of Puget Sound Chinook Populations, Exploitations Rates, Catch and Sampling under the 2004-2008 RMP*, NWRO, NOAA - Draft pending (2010)

<sup>38</sup>Id.

<sup>39</sup>Id. at Table 1.

Of this total, the WDFW has submitted 78 individual state-operated hatchery plans for review and the Tribes have submitted 36 HGMPs, shown below in Table 2.

**Table 2. HGMPs Submitted for Approval in Puget Sound**

<b>Plan Type:</b>	<b>Total</b>	<b>Chinook</b>	<b>Coho</b>	<b>Pink</b>	<b>Chum</b>	<b>Sockeye</b>	<b>Steelhead</b>
	<b>114</b>	<b>41</b>	<b>36</b>	<b>2</b>	<b>13</b>	<b>2</b>	<b>20</b>
State Hatcheries	76	27	23	2	4	2	18
16 Tribal Hatcheries	37	14	12	0	9	0	2
USFWS Hatchery (Quilcene)	1	0	1	0	0	0	0

These HGMPs are currently being evaluated for ESA and NEPA compliance through an on-going, programmatic review process led by the NMFS Salmon Recovery Division, Hatcheries and Inland Fisheries Branch. With regard to the status of the HGMPs, NMFS stated:

The ESA review portion of the process will lead to a determination of whether the plans address criteria defined in the ESA (4)d Rule Limit 6 for the Puget Sound chinook and Hood Canal summer chum salmon ESUs (70 FR 37160, June 28, 2005) and in the 4(d) Rule for the Puget Sound Steelhead DPS (73 FR 55451, September 25, 2008). For HGMPs determined through NMFS review to address the 4(d) Rule criteria, ESA section 9 take prohibitions will not apply to all hatchery activities managed in accordance with the plans. To meet NEPA requirements associated with NMFS's proposed ESA determination, an EIS is being completed to disclose to the public the likely environmental effects of the proposed hatchery programs, and of alternative hatchery production scenarios under the programs, on natural and human resources in the Puget Sound region.

A DEIS should be available for public review and comment in summer 2011, with the FEIS proposed for completion in early 2012. We plan to use the information and analysis developed in the FEIS process to indicate likely hatchery program and associated research, monitoring and evaluation action effects on listed Chinook salmon, summer chum salmon and steelhead doe completing final ESA 4(d) Rule limit 6 determinations for the regional programs. A section 7 biological opinion will also be completed using FEIS findings to address the effects of the federally managed and funded programs and actions in the Puget Sound region on listed salmon and steelhead. The ESA review process for the region's hatchery programs should also be completed in late 2011.

For the interim period, all Puget Sound region HGMPs submitted to NMFS are considered to be in the process of ESA review. As such, although no final ESA determinations have yet been made for the plans, the state, tribal and federal plan operators have taken all of the necessary steps available to ensure that the hatchery plans are considered under the appropriate, required NEPA and ESA impact review processes. The hatchery programs remain in operation as the ESA and NEPA review processes progress. NMFS maintains regular contact with WDFW, tribal, and USFWS hatchery resource managers to ensure that the on-going Puget Sound hatchery programs are being implemented as described in the HGMPs now under review, and to incorporate any adjustments in regional hatchery planning efforts (e.g., implementation of newly

developed hatchery reform measures) in the on-going NEPA and ESA effects review processes.

Given the current status of our ESA review process, *it would be pre-decisional at this time to indicate any NMFS position about the acceptability of the regional hatchery plans with regards to compliance with ESA protective provisions, including section 7 consultation findings.* With the exception of programs propagating and affecting summer chum salmon in the Hood Canal region, the hatchery programs in Puget Sound are not covered under any ESA authorization for listed salmon and steelhead takes at this time. Again, WDFW, the Tribes, and USFWS have taken all of the necessary steps to ensure that their HGMPs are considered for approval through NMFS's ESA review processes, which are on-going, and due for completion in late 2012.<sup>40</sup>

Based on the foregoing, we conclude that the assessment of HGMPs under the Hatchery RMP is premature and should await the NMFS ESA review process which is underway.

However, in terms of implementation status, we should note that our interviews with NMFS and Co-Managers staff indicate that the NMFS hatchery review program is critically under-resourced. There is presently a backlog of 114 HGMPs that require review, analysis and approval, and only one staff person has been allocated by NMFS to handle this work. The approval of these HGMPs is a critical element of the implementation of the Hatchery Management Plan.

Although the HGMPs are not yet approved, the Co-Managers intend to track progress of each HGMP through the HGMP permit reporting process and through other reporting tools. For example, the WDFW recently developed the 21st Century Salmon and Steelhead Initiative (SSI), an integrated management framework, to help it identify and evaluate long-term, science-based management hatchery strategies. The SSI sets out goals, assesses where WDFW is in relation to those goals, and identifies benchmarks to measure progress. Additionally, the WDFW is implementing the Hatchery and Fishery Reform Policy (Pol-C3619, adopted by the Washington State Fish and Wildlife Commission). The WDFW also provides information on hatchery management activities to the Governor's GMAP (interagency) performance management system, and provides annual hatchery information for the Governor's State of the Salmon Report.

All of those sources, along with tribal monitoring and reporting activities, should be used in the future to determine the performance of the implementation of the Harvest RMP. Finally, additional staff resources should be allocated within NMFS to allow for timely completion of NEPA and ESA review processes required to authorize on-going and new hatchery risk minimization and reform actions included in the HGMPs currently being implemented, or proposed for implementation, in Puget Sound.

## Results of the Harvest RMP Assessment

Using the benchmarks for implementation suggested in the October 31, 2007 Draft Monitoring and Adaptive Management Plan, we examined whether the core strategies found in the Puget Sound Chinook Salmon Harvest RMP are being met. The results were gathered from the monitoring data collected by the Co-Managers and as analyzed by NMFS. We should note that NMFS is expected to release the results of its analysis of the new RMP within the next few months, which will update the information presented here. As a result, their conclusions may change based on newer information. In the meantime, it appears that the Harvest RMP is being implemented as planned. Additional resources

<sup>40</sup>(Emphasis added). Memorandum from Tim Tynan, NOAA NMFS, 2010.

are needed to continue to adapt and improve the technical tools used to estimate population abundance, productivity and diversity, and to continue enforcing harvest limits regulated by the WDFW.

**Table 3. Assessment of Performance under the Harvest RMP<sup>41</sup>**

Benchmark	Achieved	Not Yet Achieved	Status Unknown	Comments
<b>Core Strategy 1:</b> Ensure sufficient spawners to maintain stability of all populations based on current habitat conditions and productivity				
All 22 populations in the ESU are protected by fishing exploitation rate (ER) ceilings <sup>42</sup> based on abundance and natural productivity thresholds		X		Exploitation rates have been established for only about 8 of the 22 populations based on productivity and capacity (Skagit summer/fall, Skagit spring and Stillaguamish NF and SF). <sup>43</sup>
Total fishery mortality (landed catch and non-landed mortality) is accounted for each year	X			See, Post-Season Harvest Reports. Technical tools to assess fishing mortality are being improved. Technical tools have been revised to correct bias and improve individual stock information in management units that are comprised of multiple populations. However, more improvement is needed. The FRAM model which is the primary harvest planning tool does not provide estimates of natural-origin escapement for any but the Nooksack populations, which limits the ability to assess the impacts of harvest on natural-origin production. <sup>44</sup>
Population abundances are predicted each year that incorporate the best estimates of uncertainty (measurement error, management error, and population variability)	X			Predictions were largely inaccurate from 2001-2007, significantly over-estimating annual abundance. The region needs to continue to refine the tools it uses to estimate abundance.
Escapement assessed annually	X			See, Post-Season Harvest Reports
Technical tools for assessing fishery mortality are improved with new information			X	It is unclear as to whether this is occurring.
Technical tools for assessing population abundance, productivity, and diversity are improved with new and better information.		X		The results here are mixed. Improvements in technical tools to assess <i>diversity</i> in any more depth (beyond population-specific analyses) have not occurred. However, better assessments of <i>productivity</i> are occurring as information is gained from improvements in estimating hatchery and wild contribution to spawning escapement, and with the increased availability of habitat-based tools.

<sup>41</sup> The assessment and comments are based on the comments received from Susan Bishop, NMFS staff. The analysis may change when NMFS releases its analysis of the new RMP in the next few months.

<sup>42</sup> In many cases, exploitation rates are expressed only in terms of southern U.S. (excluding Canadian and Alaskan harvest) or pre-terminal southern U.S. rates. From a legal standpoint, this makes sense because the Harvest RMP only has jurisdiction within U.S. waters (specifically, within Puget Sound). In the future, the Co-Managers may want to consider establishing total exploitation rates (TER) because it requires the management of fisheries in a way that takes into account the full amount of harvest impact on a stock, and develops exploitation rates that are more conservative biologically, in terms of survival and recovery.

<sup>43</sup> Other populations consist of a mix of past average rates, rates that have seen some increase in escapement, policy choices about balances of conservation and fishing opportunity and transitional strategies. In several cases, NMFS believes the data may be insufficient to develop productivity/capacity-based rates. Additional monitoring is needed to provide the necessary data, although EDT assessments may provide a workable substitute in the near-term.

<sup>44</sup> Comments from Susan Bishop, NMFS (September 2010).

Benchmark	Achieved	Not Yet Achieved	Status Unknown	Comments
				Improvements in <i>abundance</i> assessments are also occurring but the pace could be faster. <sup>45</sup>
Enforce fishery rules and regulations	X			See, Post-Season Harvest Reports; Given the current State budget crisis (which is resulting in WDFW budget cuts and may affect Tribal resources) future enforcement efforts could be impacted.
Evaluate effectiveness of regulations		X		WDFW and the Puyallup Tribe track and report on their regulatory enforcement efforts. Neither agency has evaluated the effectiveness of their fishery regulations. Other Tribes do not report on their regulatory enforcement efforts.
<b>Core Strategy 2:</b> Allow populations to rebuild as other constraining factors are alleviated by limiting mortality rates on individual populations to levels that are consistent with achieving ESU viability.				
Identify RERs for all populations <sup>46</sup>		X		As noted above, RERs have been defined in the Harvest RMP for 8 of the 22 populations. NMFS has developed RERs for several additional populations; uses them in its assessments of harvest, but the Co-Managers have not adopted them (Nooksack, Green, Skokomish). Several of the watershed recovery plan chapters call for development of RERs, but that has not occurred yet.
<b>Core Strategy 3:</b> Provide harvest opportunity on other species while rebuilding the ESU				
Fishing opportunities occur for other Pacific salmon species while preventing further declines of Chinook populations due to harvest	X			See, Post-Season Harvest Reports.
<b>Core Strategy 4:</b> Adhere to the principles of the Puget Sound Salmon Management Plan (PSSMP) and other legal mandates pursuant to <i>U.S v Washington</i> and the terms of the Pacific Salmon Treaty (PST) and its annexes.				
Harvest management occurs as a government-to-government process among tribal, state, and federal managers	X			
Annual fishing regime is established each year following procedures in PSSMP	X			
Preseason forecasts and management agreements occur annually	X			
In-season modifications of harvest regulations follow procedures specified in PSSMP	X			See, Post-Season Harvest Reports.
U.S. and Canada manage fisheries	X			Canadian and Alaskan harvest does impact (in some

<sup>45</sup>For example, the Cedar River escapement goal was revised last year, but did not incorporate the increased capacity above Landsburg Dam. It should be noted that all of this work is very labor intensive. With more listed species, increasing demands for improved information and fewer people to do the work (with shrinking resources), NMFS staff reports that much of the work is being accomplished through “triage.” Unless additional resources are added to this work, the changes needed are unlikely to happen within a reasonable timeframe. (S. Bishop, NMFS Staff, September 2010).

<sup>46</sup>Recovery exploitation rates (RER) may be developed by a variety of analyses. As used here, total RERs refer to rates developed by using CWT data to quantify total mortality and spawning ground escapement and age information to develop spawner-recruit relationships.

Benchmark	Achieved	Not Yet Achieved	Status Unknown	Comments
consistent with the terms of the PST annexes.				cases, significantly), Puget Sound populations, but it is being conducted in accordance with the 2008 PST Annex.

NMFS has concluded that the harvest limits established in the Harvest RMP have been followed for all 22 populations since its adoption. In terms of the performance of the population under the Harvest RMP, total natural escapements for 11 of 19 populations (and one management unit for which there are rebuilding thresholds), met or exceeded the established thresholds from 1999-2008.<sup>47</sup> In terms of the level of effort expended in implementing the Harvest RMP, the Co-Managers have implemented a significant amount of monitoring and reporting, and this work is on-going each year. As noted in the table, above, there are several areas within the Harvest RMP Plan that need further work and additional resources to accomplish it. In addition, the Co-Managers need additional funding to continue (or in some cases, to begin) working with their counterparts in each watershed to pursue H-integration.

As the timeframe of the initial Harvest RMP comes to a close, work is now underway to renegotiate the Harvest RMP between NMFS and the Co-Managers.

## Results of the Habitat Plan Assessment

### Background

Five years have passed since the creation of the Shared Strategy's Puget Sound Chinook Salmon Recovery Plan. Since that time many things have changed. The Shared Strategy nonprofit organization was closed as planned, and the work of implementing the Recovery Plan was transferred to the newly created PSP at the direction of the Legislature. New staff was hired to lead the PSP's Salmon Recovery Program, including a new manager and new watershed liaisons. In the past three years, the PSP Salmon Recovery Program has grown from three to seven full-time watershed liaison staff positions, but their work has also expanded from supporting each watershed's salmon recovery effort to include ecosystem recovery as well. Additionally, the Governor's Salmon Recovery Office has been moved out of the Governor's Office and placed under the authority of the Recreation and Conservation Office (RCO), which also supports the Salmon Recovery Funding Board.

Stakeholders who were key participants in creating the Salmon Recovery Plan began working with the PSP and others to create the Action Agenda, a blueprint for ecosystem recovery in Puget Sound. New groups were formed to support the effort, including the Ecosystem Coordination Board, Leadership Council, and Federal Caucus, to name a few. New action areas were defined, as called for in the PSP's enabling legislation, within which the ecosystem recovery work would occur. The Action Agenda was adopted in 2008 and it included the Puget Sound Chinook Salmon Recovery Plan. The implementation of the Action Agenda is newly underway, and the PSP is working to determine how that work integrates and complements the work that is already happening under the Recovery Plan at the local level.

In analyzing implementation of the Recovery Plan, we asked two questions: First, we asked whether the strategies that were included in the Plan are being acted upon to determine whether the Plan is actually guiding actions across the ESU. Second, we asked whether the pace of implementation was sufficient to achieve the 10-year goals stated in the Plan in order to determine whether we are on track or falling behind in implementation. The answers to those questions are set forth below.

<sup>47</sup>Per Comments from S. Bishop, NMFS (2010). The results of NMFS evaluation of the new RMP is expected to be released in the next few months and will update (and may change) the information presented here.

## Question 1: Are the Recovery Strategies Being Implemented as Described in the Recovery Plan?

Like the rest of the nation, the economy in Puget Sound has suffered under the worst recession since the 1930s. As a result, state and local governments have seen significant shortfalls in tax revenues, causing program and staffing cuts at all levels. Work in each of the 14 watersheds has continued, but many of the Lead Entity organizations have suffered significant cutbacks in staff and program financial support that they receive from local government partners. Both Island County and San Juan County lost their full-time watershed lead staff for a time. Those staff have been partially restored, but not to prior levels.

Watershed leads report that their programs are critically under-resourced and most are behind the pace they expected to achieve at the outset of their recovery work. They face increasing competition for their time and that of their stakeholders, with new efforts to implement the Action Agenda, update local NPDES and shoreline programs, respond to new National Flood Insurance Program requirements, address the effects of climate change, create adaptive management programs, support and foster restoration projects, respond to regional demands and reporting requirements, and collaborate across the ESU.

In short, there are many reasons why the work could be faltering or failing. However, in spite of all these challenges, and significant changes in the effort's infrastructure, the voluntary effort around the Sound persists. The participants' commitment to recovery has not wavered. This alone is a significant accomplishment for the collaborative model of recovery planning under the Endangered Species Act. But, there is more.

Progress is being made and with five years of experience behind them, watershed recovery work is becoming more strategic and efficient across the Sound. In this Report, we will examine the areas where progress has been made and where challenges or obstacles exist, using the qualitative and quantitative measures described in Section II, above. For the analysis of each individual watershed effort, see Appendix A, "Puget Sound Chinook Salmon Recovery Plan: Watershed Implementation Progress Reports."

Not all watersheds started from the same place in terms of recovery implementation. We review their progress relative to where their implementation efforts began.

As a key part of the assessment work, we created tables for each watershed that reflect their habitat goals and strategies published in the Recovery Plan, and then tracked the watershed's reported actions to see whether they were implementing those goals and strategies, and whether they were on pace with the Recover Plan's 10-year timeframe.<sup>48</sup>

In reviewing the assessment findings, it is important to note that not all watersheds started from the same place in terms of implementing their local recovery plans. For example, the Snohomish and Green-Duwamish watersheds prepared very specific, targeted recovery goals and strategies that were complete at the time of adoption of the Recovery Plan. But several other watersheds (e.g., Elwha-Dungeness, Island, Puyallup-White, East Kitsap, etc.) stated that additional studies were needed in order to complete their local watershed plans and create additional strategies and actions for recovery. For the latter group, the early years of plan implementation were largely years of additional research, study and further plan development.

<sup>48</sup> See Appendix A.

Still other watersheds had planning areas that were so large, they required very lengthy plans, with hundreds of individual strategies defined by sub-basins and river reaches (See, e.g., WRIA 8, the Lake Washington/Cedar/Sammamish watersheds and South Sound nearshore planning groups). For them, the sheer geographic scope of the work has forced them to be opportunistic at times and create “start lists” that don’t cover all of the plan strategies, but it has helped them prioritize their efforts in the early years. Accordingly, when we gauge the progress of a watershed against its plan, we recognize that progress is made within the context of and relative to the unique circumstances of that place.

**In answering Question 1, we can say with confidence that the original strategies defined in the Recovery Plan for the 14 watersheds in the ESU are being pursued through various actions, but at this stage of implementation, the work is heavily weighted toward capital habitat restoration activities.**

The work to implement the Recovery Plan is divided into two general categories: capital programs (e.g., habitat restoration projects and property acquisitions), and programmatic actions (e.g., habitat protection through regulation or incentive programs, outreach and education, scientific research and technical assessments, project development and lead entity support). Both of these major program areas were assessed and the findings are described below.

## Capital Projects

Most watersheds have heavily weighted their efforts in early years toward capital projects (meaning habitat restoration and property acquisition actions). Some of this emphasis may reflect a bias in available funding, which tends to favor capital projects that are “shovel-ready,” for which immediate tangible results can be shown, over programmatic work which is harder to evaluate. Additionally, the Lead Entity structure set forth in state law only speaks to habitat capital projects.<sup>49</sup> Additionally, capital projects are often easier to agree on and accomplish than non-capital work, which is typically more time intensive, policy-oriented, political and often more difficult to accomplish without causing and resolving conflict within a diverse watershed group.

We used the 3-Year Work Program Schedules and HWS to track whether actions were consistent with stated goals and strategies. Our analysis found that most watersheds are actively working on high priority projects, with some exceptions. There are many stories of success and progress that can be shared from watersheds around the Sound. Many of them are found in Appendix A. Where actions were not in keeping with stated Plan priorities, we found that the reasons for the exceptions varied from place to place. The reasons included:

- In some cases, the reasons reflect local politics and social issues, such as the belief that funding raised through local sources needs to be spent in local areas, even if those aren’t the highest priority areas in the Plan.<sup>50</sup>
- In other cases, just the opposite was true. Some watersheds have transferred their funds to other watersheds to support high priority projects, rather than spend funds locally. Most did this because they felt that the actions in other areas were critical to the success of their own plans. (This has been

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<sup>49</sup>See, RCW 77.85.050.

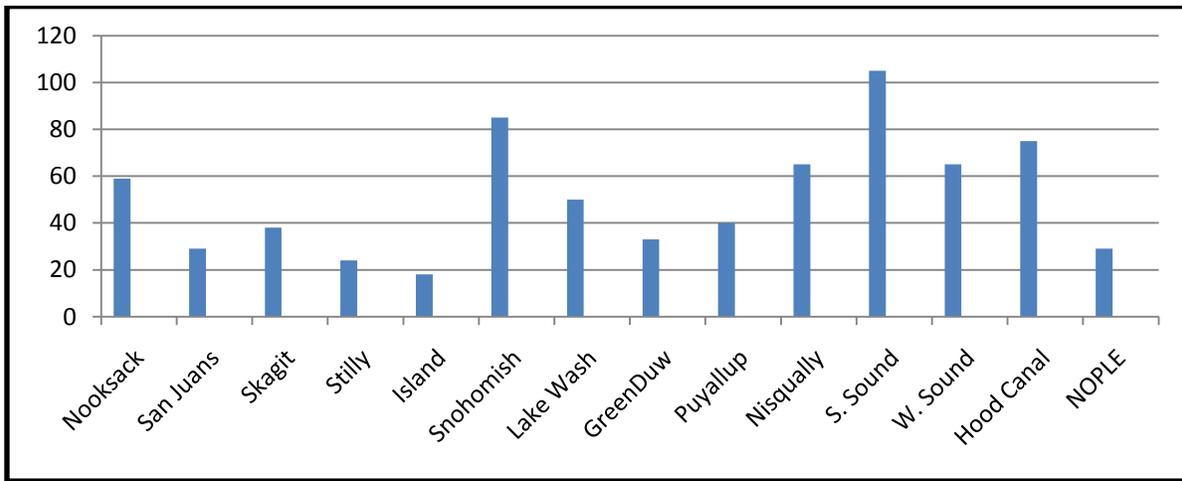
<sup>50</sup>For example, in the Snohomish Plan (WRIA 7), the Plan states that the highest priority actions in the first 10 years (meaning 80% of their efforts) should be focused in the nearshore, estuary and mainstream areas. Funding received through the Lead Entity in WRIA 7 (e.g., SRFB Funds) is allocated in accordance with this goal through a 40%-60% King/Snohomish County funding split. However, other funds received separately through other sources by the jurisdictions are not allocated according to the Plan’s 40%-60% split. In the Green/Duwamish (WRIA 9), the ILA members are seeking to address this same issue by creating a watershed investment district, which would allow funds to be raised across jurisdictional boundaries and spent within the watershed on Plan priorities.

true in the nearshore planning areas of South Sound and West Sound, where cross-watershed collaboration has been high, leading to the successful construction of the Nisqually watershed’s estuary restoration project).

- In a few watersheds, high priority actions consist of single, significant projects such as the Nisqually Delta Restoration Project or the removal of the Elwha dam. In these cases, until adequate funding is found and other preliminary actions (land acquisitions, native plant propagations, permits acquired) are taken, lower priority actions continue to be taken to advance recovery.

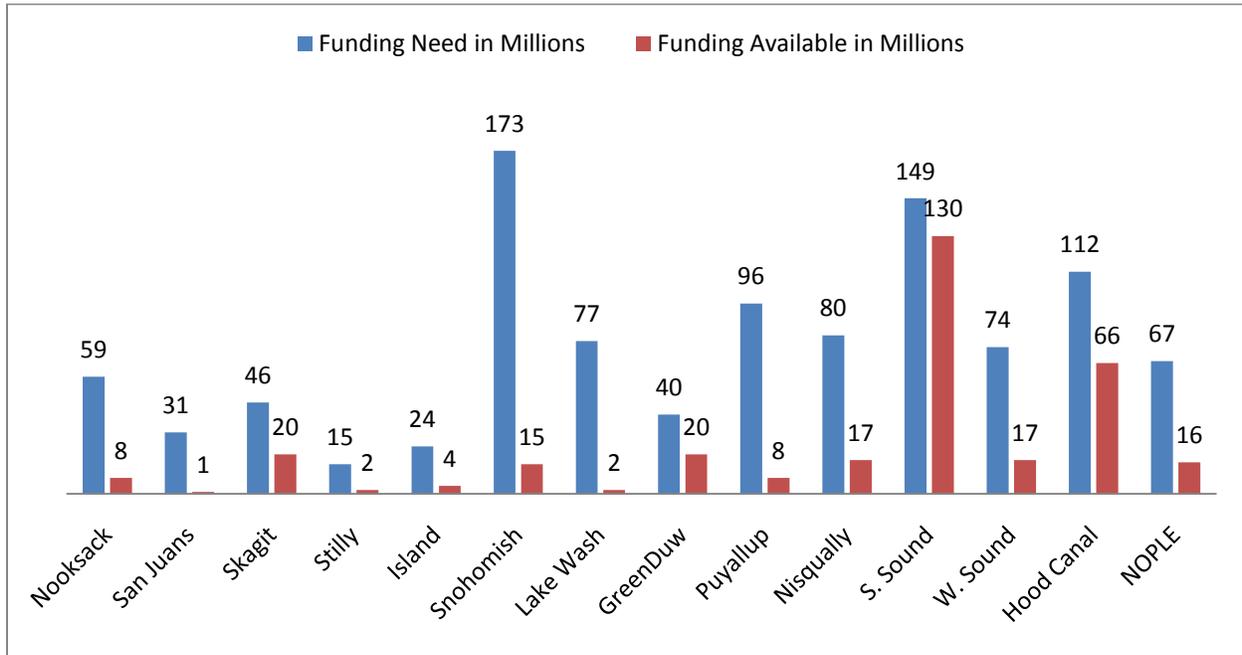
In terms of the scope of the overall capital restoration work in progress, the total number of planned projects reported on current three year project lists is approximately *715 projects*. The estimated funding needed for those projects is *\$1.04 billion*. The amount of funding available is *\$326 million* (or 31% of the amount needed to accomplish the work). To close the funding gap of \$686 million, the region must consider making a significant change from the status quo.<sup>51</sup>

**Table 4. Total Number of Capital Projects on 3-Year Work Programs by Watershed**



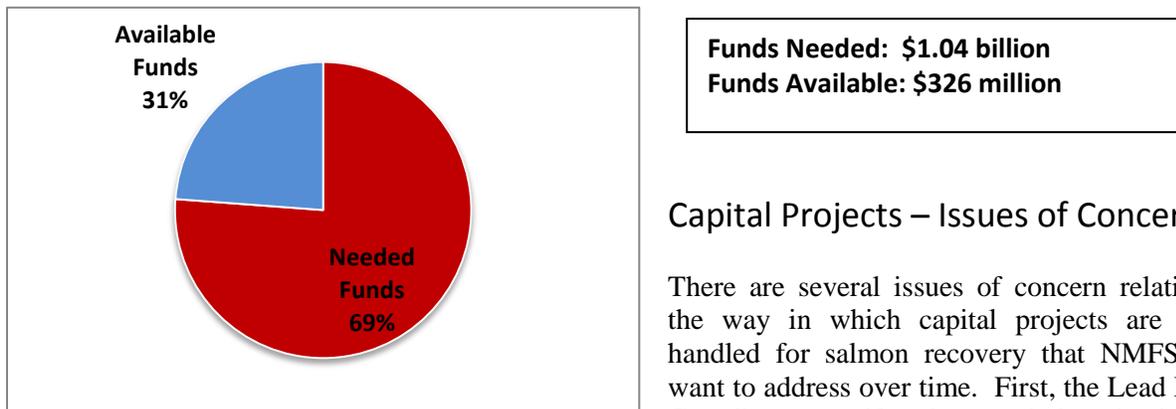
<sup>51</sup>Our assessment found that the Green-Duwamish Watershed has taken the initiative on its own to address its funding resources. In addition, the RCO is presently developing a state and regional funding strategy for implementing recovery plans.

**Table 5. Funding Status for Capital Projects on 3-Year Work Programs by Watershed**



Clearly, the funding needed to complete the current three year list of projects is simply not available. Although the amount of funding for capital projects has increased by significant amounts over the past five years, funding levels still need to take a quantum leap forward if watersheds are to stay on track and successfully complete their habitat restoration work within the 10-year time frame established in the Recovery Plan.

**Figure 4. Total Funding for Capital Projects Shown on 2010-2013 Work Programs**



### Capital Projects – Issues of Concern

There are several issues of concern relating to the way in which capital projects are being handled for salmon recovery that NMFS may want to address over time. First, the Lead Entity Coordinators uniformly stated that the lack of

funding for capital program staffing (sometimes referred to as “capacity” funding), not only hurts their local efforts within the Lead Entity organization, but it also limits the ability of their local partners who design and build capital projects (“project sponsors”) to advance projects in a timely way. They also reported that the manner in which grant funding is distributed is unnecessarily constraining their efforts. Specifically, they state that grant local matching requirements are too rigid and unnecessarily limit projects. The staff believes that they can do a better job of implementing their programs if they are

simply given the funding needed for projects and programs and held accountable for the results. They note that a tremendous amount of their time and energy is now being devoted annually to the bureaucracy that has sprung up around funding, and the 3-Year Work Programs, and it is limiting their ability to accomplish their substantive work on salmon recovery.

Second, inadequate funding has consequences for habitat protection, as well. All watersheds are relying on some level of land acquisition as a key strategy to protect and restore habitat, and most, if not all of them, have prioritized land acquisition sites within their 3-Year Work Programs. However, acquisition opportunities may be permanently lost without adequate funding to timely purchase lands when they become available. (For example, the Green-Duwamish watershed reports that several critical acquisition properties have been recently sold for development, forestalling restoration and protection on those sites for the foreseeable future). At some point, watersheds heavily relying on acquisition for protection of habitat may need to reconsider their Plan strategies and VSP assumptions, if they are unable to purchase those lands needed for recovery.

Third, the manner in which capital projects are being accomplished appears to be somewhat opportunistic and may be inefficient. In operating a typical public works construction program, the public agency identifies needed construction projects, establishes their priority, seeks needed funding, designs the project, solicits bids for construction, and provides some level of management oversight of the construction project for quality control. There is some variation in the manner in which these tasks are performed across the State (where some of these tasks are performed through outside consultants), but overall, most capital construction programs are run in this manner. This centralized system has evolved over time for a number of reasons (e.g., funding constraints, need for efficiency and quality control, labor laws, etc.), but is fairly well-established as the way in which large, on-going capital programs are accomplished.

The capital project lists for salmon habitat restoration are in fact large capital programs. However, they are not run in the same centralized manner as other public capital programs. Instead, they operate in a decentralized fashion. The Lead Entity uses the broad framework of the Recovery Plan to solicit proposals from the public and private sectors on an annual basis, tied to funding cycles. The Lead Entity does not drive the construction program in the same way as a public works agency would. Instead, they put out an annual call for projects, hoping that their partners within the watershed are interested in and capable of designing, constructing and managing the capital construction projects that support the Recovery Plan. Those watersheds with enough staff often work with project proponents to shape the design of projects, but not all have the staffing to do this. In addition, not all watersheds have prioritized project lists. Some are operating on an opportunistic level to build projects, instead of driving projects in the places where the need is the greatest according to the Recovery Plan.

The effect of this decentralized approach on the implementation of habitat restoration is that it can lead to a patchwork of projects across the landscape. Without a centralized focus driving priorities under the local Plan, the Lead Entity may be less efficient from a time and cost standpoint. More importantly, a patchwork approach could prevent a watershed from achieving the synergistic effect of restoring habitat in a way that leads to the restoration of habitat-forming processes.

## **Non-Capital Programs**

Each watershed has also adopted programmatic strategies that need to be implemented as part of the protection and restoration goals in their local plans. They generally fall into the following categories:

- Habitat protection through land acquisition, improved regulation and the creation and use of incentive programs
- Outreach and education to the public, stakeholders and the Legislature/Congress

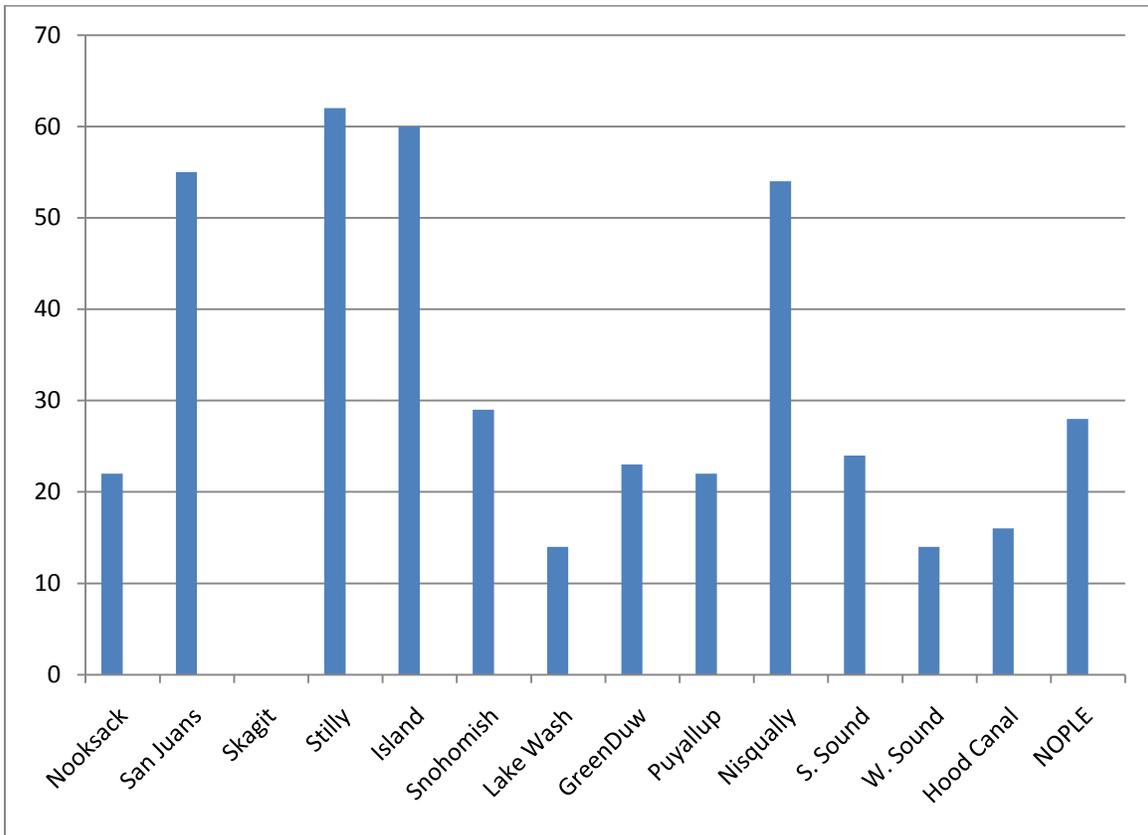
- Scientific research and assessment projects
- Habitat status and trends monitoring
- Adaptive management program development
- Cross-watershed collaboration and coordination
- Lead Entity partners and stakeholder coordination and collaboration
- Development of additional plan strategies and actions
- Habitat restoration project development and planning
- Habitat restoration project management

Although each watershed plan contains many or all of these programmatic strategies, we found that the implementation of actions related to them varies greatly. As noted above, funding for non-capital programs is severely limited. However, these programs are vitally important to the success of the Recovery Plan.

As to specific portions of the non-capital programs, every watershed plan calls for outreach and education as a key component of gaining adequate support for Recovery Plan implementation. Yet, only a few watersheds have adequate funding and staff to engage in this staff-intensive work on an on-going basis. Fewer yet have the ability to engage in outreach to key legislators, who are important players in funding Recovery Plan programs. The same is true for habitat monitoring and adaptive management programs.

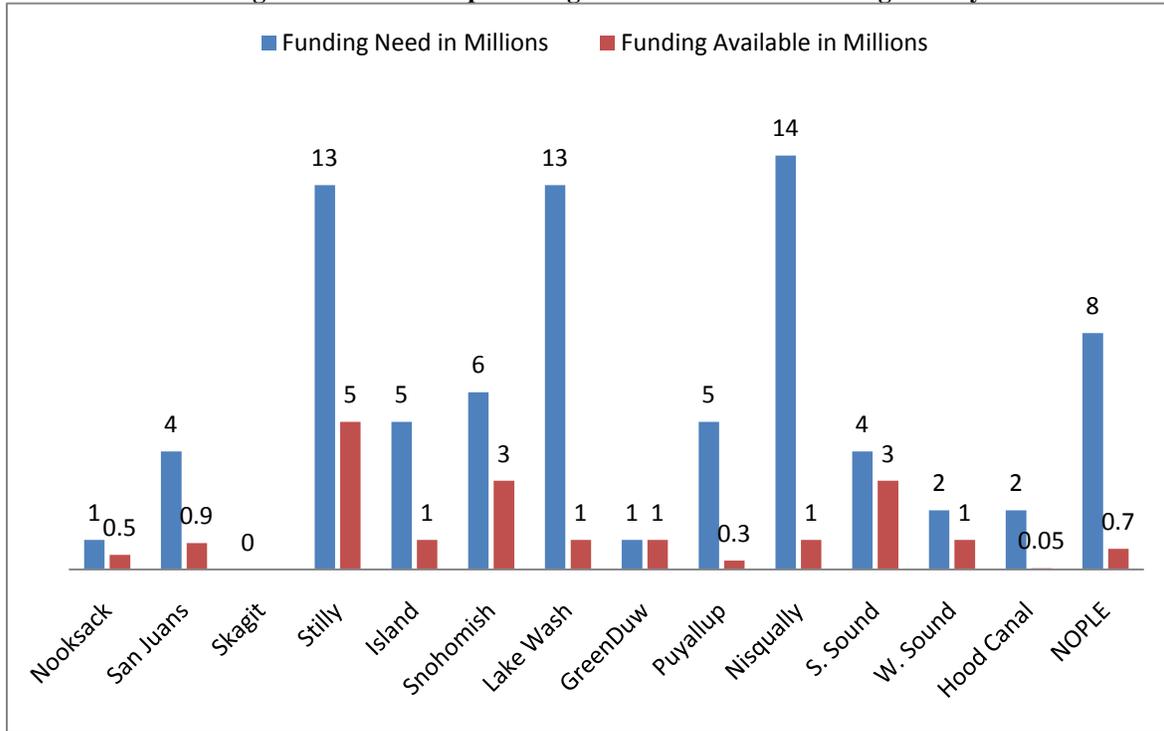
In terms of the scope of the overall non-capital programmatic effort in progress, the total number of programs reported on current 3-year project lists is more difficult to assess than capital programs because some watersheds don't report this data on the 3-Year Work Program. For those watersheds that report non-capital programs, there are *423 total programs* proposed for implementation in the 2010-2013 3-Year Work Program. The estimated funding needed for those programs is approximately *\$78 million*. The amount of funding available is approximately *\$18 million* or 20% of what is needed to accomplish the work. Clearly, the funding available for non-capital programs is far below what is needed to achieve the 10-year objectives established in the Recovery Plan.

**Table 6. Total Number of Non-Capital Programs on 3-Year Work Programs by Watershed<sup>52</sup>**

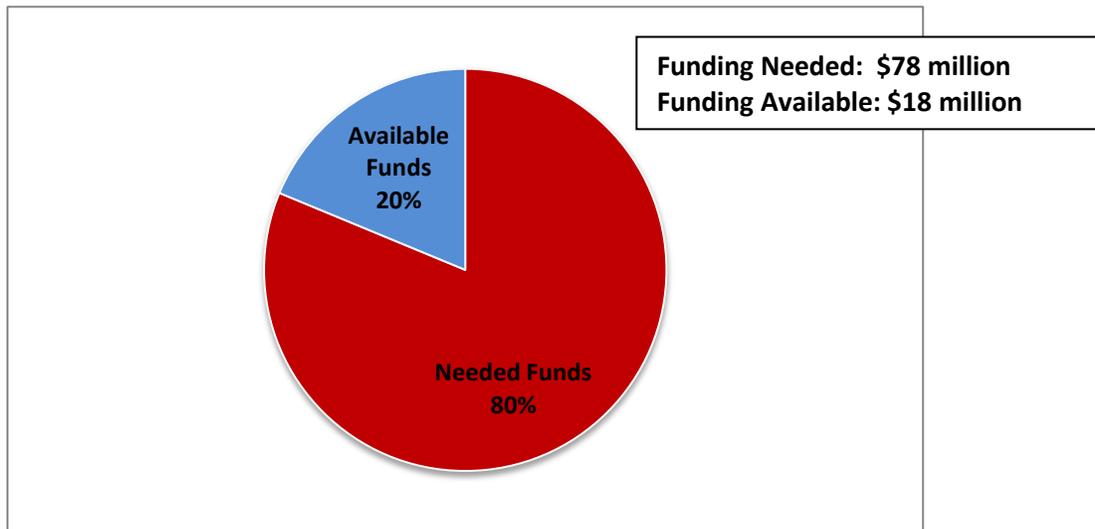


<sup>52</sup>Note that this information is our best estimate to date given the incomplete information set forth in the 3-Year Work Programs.

**Table 7. Funding Status of Non-Capital Programs on 3-Year Work Programs by Watershed**



**Figure 5 – Total Funding for Non-Capital Programs on the 2010-2013 Work Programs.<sup>53</sup>**



<sup>53</sup>Note: These figures represent our best estimate of funding needed and funding available, given the limited information available in the 3-Year Work Programs. Several watersheds do not report non-capital program items in the Plan. Others have incomplete information shown in terms of program cost estimates and available funding sources.

## **Habitat Protection**

As a special area of inquiry, we were asked to examine whether watersheds are implementing the habitat protection strategies found in their Recovery Plans. We found that all watershed plans include habitat protection and rely on a mix of strategies, including land acquisition, land use regulation and the creation of new land use incentive programs. We will examine each strategy in turn.

### **Protection through Acquisition**

We found that every watershed is actively engaged in land acquisition for protection, but that funding is a significant limiting factor in the pace of implementation, as well as landowner willingness to participate. Where land becomes available for acquisition, funding constraints often limit a watershed's ability to compete with the private sector in purchasing such properties.

In addition, most of the watersheds that have a solid track record of success in acquiring properties also have active outreach and education programs aimed at properties in an area targeted for acquisition. Watersheds that lacked funding for this initial outreach work felt they were less successful in acquiring lands from private property owners.

### **Protection through Regulation**

All but a few watersheds are relying on existing and/or planned updates to state and local land use regulatory programs to protect habitat against further decline. However, our cursory survey of federal, state and local regulatory programs found that despite the ESA listing of Puget Sound Chinook Salmon in 1998, few regulatory programs have changed much since that time. In particular, even though Section 7 requires consultation by federal agencies whose programs or actions may adversely affect listed species, many have been slow to change without external pressure (such as through litigation).<sup>54</sup>

Additionally, very few local governments within the ESU have completed updates to their key environmental regulations (e.g., critical areas ordinances, shoreline master programs, flood hazard regulations, clearing, grading, drainage and stormwater regulations using best available science). Many federal, state and local governments are still using land use and aquatic regulations that were part of the consideration for NMFS's listing decision. We note that deadlines for completing updates to critical areas ordinances, shoreline master programs, stormwater regulations under NPDES, and NFIP flood hazard regulations are pending and are likely to be completed over the next five years. But, further work needs to be done to quantify the status of regulatory protections across the ESU. An examination of code enforcement programs at the federal, state and local levels could also enhance the effectiveness of regulatory programs, by ensuring that regulations are being properly applied during permitting and followed by landowners. This type of assessment is probably more important now as state and local funding levels have caused significant layoffs in permitting and code enforcement staff.

We also found that few regulatory agencies or Lead Entities have studied the effectiveness of the regulations on which they are relying (which requires on-going monitoring). Only the San Juan Islands has assessed the regulatory programs on which they are relying to determine whether they are achieving the type of habitat protection necessary for recovery, or whether further habitat decline is occurring. Without such an assessment, the other watersheds cannot say whether their assumptions about habitat protection are being achieved through regulatory tools and enforcement efforts that are in effect.

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<sup>54</sup>See, for example, the US Army Corps of Engineer Levy Vegetation Standards; the FEMA National Flood Insurance Program

In terms of their participation, we found that most watersheds (Lead Entities) are *not* actively advocating for increased habitat protection through land use regulations mainly because Lead Entities are “big tent” organizations. They include people and organizations that often have significant differences of opinion about the role that land use regulation should play in habitat protection.<sup>55</sup> While some believe that governments need to do more to protect habitat through regulation, others oppose stronger land use regulations to protect habitat. Given this dynamic, most watershed groups find it difficult, if not impossible, to advocate for stronger regulations without alienating some of their partners.

Although most Lead Entities are not leading the charge for more protective regulations, they can, and often are, playing a supportive role in regulatory change. We found that more Lead Entities are actively tracking regulatory update processes of local governments within their planning areas than was first thought. Many technical staff from one or more of the participating agencies or Tribes within a watershed are working with local governments in some form (many by participating on technical advisory committees) to provide the scientific information needed to support regulatory updates and improvements that will benefit salmonids and increase habitat protection.

Finally, we found that there is no uniformity in the level of protection afforded to habitat processes, structures, or functions across Puget Sound. Regulatory standards for habitat protection vary widely across the ESU.

- Although the State Department of Commerce (formerly CTED) plays a role in reviewing GMA critical areas ordinances, they have no authority to require changes to those plans absent a successful appeal to the Growth Management Hearings Board (and success in further court appeals). Given the risk and expense of litigation, most jurisdictions will not re-open or amend these environmental regulations more frequently than they are required by law. As such, if a local jurisdiction’s regulations are not appealed, they typically remain in place unchanged for another seven years.
- Shoreline master programs under the SMA, and drainage and grading codes implemented pursuant to NPDES permits are reviewed by the Department of Ecology (DOE), which increases the uniformity of protection for shorelines and against stormwater pollution; however the deadlines for most jurisdictions to complete those updates are several years away.
- FEMA has recently produced new guidance for regulating flood hazards within the floodplain and adjacent upland areas in response to NMFS’s Biological Opinion examining the NFIP. Following FEMA’s new guidance is required for jurisdictions that want to participate in the NFIP. However, these regulations will likely differ from the standards required to be met under the SMA and GMA for protecting the same geographic areas.
- In addition, there is little to no guidance in existence at the federal, state or local level for implementing regulations that employ “mitigation sequencing,” (meaning one that calls on developers to avoid, minimize, mitigate, and/or restore habitat impacted by development). There is no guidance as to how much of an effort must be made to avoid, before one is allowed to minimize or mitigate impacts. This type of guidance is crucial to understanding the true level of protection that will be afforded from a regulatory standard.

Using land use regulation to protect habitat can be a powerful tool. However, the system of federal, state and local laws that form the web of regulation applicable to the lands needed to recover Puget Sound Chinook Salmon is complex and sometimes difficult to understand. The issues outlined above require

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<sup>55</sup>When asked in 2007 about playing a leadership role within their watersheds to increase protection through regulation, many watershed staff stated that their watershed groups were not formed for that purpose and believed that many parties would not participate if that was their stated role. It is unlikely that this position has changed much in the past three years.

further study and strategic analysis to ensure that protection is being accomplished in a meaningful way. The Recovery Plan recognized the complexity of these issues in describing the regional work that needs to be accomplished for recovery. However, we found that no federal, state or local program or project currently exists to tackle all of these complex regulatory issues in a holistic fashion.

## **Protection through Incentive Programs**

Every watershed plan calls for the creation and use of voluntary, incentive programs to encourage landowners to protect habitat. However, virtually no work is being done in any watershed to implement this specific protection strategy. No such programs were found on the 3-Year Work Program lists, and it appears that no project or program has been funded by a federal, state or local government to accomplish this work. There has been some work to develop Transfer of Development Rights programs by local nonprofit organizations and a few local governments, but few other incentive tools have been attempted.

## **Protection through Regional Program Elements**

The Recovery Plan calls for the creation of a number of strategies on issues that affect Chinook Salmon across the ESU.<sup>56</sup> Many of these regional strategies are cited in the NOAA Supplement to the Recovery Plan as high priorities for development and implementation. The regional issues called for in the Recovery Plan include:

- The Protection of Existing Physical Habitat and Habitat-Forming Processes
- The Protection and Restoration of the Nearshore, Puget Sound and Pacific Ocean
- Water Quantity – The Strategy for Achieving and Protecting Instream Flows
- Water Quality Strategies
- Commercial Forestry Strategies
- Commercial Agriculture Strategies
- Research, Monitoring and Adaptive Management

As part of our research, we forwarded the list of regional strategies that was described in the Recovery Plan to the PSP, and asked whether the development of these programs was on the current regional work program or being developed or advanced by the PSP or Recovery Council. No response has been received yet. Based on our independent research, it does not appear that these programs are being advanced at this time.

As one example, further discussion and collaboration was called for in the Recovery Plan relating to land use conflicts between commercial agricultural and habitat for salmon recovery.<sup>57</sup> Further work on this topic was stalled when the Legislature enacted a “time-out,” essentially prohibiting the adoption of new critical areas regulations that placed prohibitions on agricultural lands until the Ruckelshaus Center convened a team of stakeholders to try to resolve those conflicts. Apart from individual efforts by local governments, tribes or nongovernmental organizations (NGOs) to carry forward the goals of the Recovery Plan into those discussions, the Lead Entities are not participating in these discussions and do not have a formal seat at the negotiating table. Further work is needed on these regional topics.

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<sup>56</sup> See, Puget Sound Chinook Salmon Recovery Plan, Volume I, Chapter 6.

<sup>57</sup> Snohomish County, which is participating in salmon recovery in both the Stillaguamish and Snohomish watersheds, is engaged in a project (Sustainable Agriculture) to begin solving these issues, but it does not appear that the salmon recovery leaders from across the region are participating in this effort.

In addition to these program concerns, we also found that work on other important programmatic items is not advancing systematically across the ESU:

### **Adaptive management and monitoring – regional and local**

Although cited in the NOAA Supplement to the Recovery Plan as a high priority for completion, an Adaptive Management Plan has not been completed for the ESU. In addition, most watersheds have not yet created their local monitoring and adaptive management plans and few have set numeric goals for habitat implementation that can be tracked. Watershed leaders have uniformly expressed frustration that although they are criticized annually for not having completed this work, the promised resources (RITT support and funding) for this work have not yet materialized.

### **H-Integration across the ESU**

Most watersheds are still not integrating and coordinating the work of Hatchery, Harvest and Habitat Plan implementation, and several Lead Entities reported that support from the PSP, State and NMFS for this work has been lacking.

## **Question 2: Are the Actions Being Taken on Track to Meet Expected 10 Year Goals?**

As we examined the work of each watershed across the ESU to determine what they were doing to implement the Recovery Plan, we also attempted to qualitatively assess how well their efforts are succeeding, what issues they may be facing and what might be needed to help address any such issues. As part of this effort, we met with each watershed and discussed their work, shared our analysis about their efforts, and listened to the staff “in the trenches” to learn more about the strength of their organizations and what if anything needs to happen to ensure they are successful.

**We heard plainly that the answer to Question 2 is “no.”** With the exception of one watershed (Nisqually), all of the watersheds report that they are behind where they thought they would be at the start of Recovery Plan implementation, in terms of the pace of their work in achieving 10-year goals. The reasons for this vary, but the main cause appears to be inadequate and unstable funding levels.

### **Project Funding**

As discussed above, the total amount of funding that the Lead Entities have estimated is needed for the 2010-2013 period for capital and non-capital programs is just over *\$1.1 billion*. The amount that appears to be available at this snapshot in time is approximately *\$344 million*. This represents approximately 20% of the funding needed in the 3-year period. Without a significant change in the amount of funding available for implementation, as well as the manner in which the funds may be spent, the 14 Lead Entities will continue to fall further behind the expected pace of recovery work.

### **Program Staffing**

Having adequate staff to perform the necessary planning and policy work to carry out all of the programs and projects identified in the Recovery Plan is vital to each watershed’s success. Most watersheds appear to be critically under-staffed to perform the sheer volume of work required to stay on the 10-year trajectory. With local government revenues falling, continued participation by their staff in watershed processes is difficult and uncertain. Staffing at the Lead Entity is critical, but it should not be overlooked that the partner agencies, Tribes and organizations contributing to recovery work in each watershed need adequate funding too, which is presently lacking.

Each of the 14 Lead Entity organizations has had five years to gain experience implementing their Recovery Plan. When we interviewed each one of them, we asked them to describe their current staffing level, as well as what they felt was needed to be successful. They responded with strikingly similar answers about the number and type of staff needed to fully implement their local Plan. From their responses we have identified a core set of program needs. They include:

#### Core Watershed Program Staffing Needs

- Program Director (typically, the lead entity coordinator)
- Program Planner/policy support person (trained in land use planning; develop new strategies, participate in protection programs)
- Restoration/Acquisition Project managers (manage or supervise construction projects, land acquisition negotiations and real estate transactions)
- Outreach and education staff (develop programs and marketing materials, build community relationships and support, lobby opinion leaders and legislators)
- Clerical support staff (schedule meetings, take minutes, coordinate work)
- Biologists, ecologist or other technically-trained staff (for project development and review, status/trends monitoring, other field work)

They also described an additional set of program support services that are very important, but it may be possible to perform these services at the regional scale to provide efficiencies and cost savings. These services included:

#### Central Service Needs:

- Group purchasing of supplies and equipment for offices, projects and programs
- Highly skilled meeting facilitators
- Annual design and publishing of marketing and outreach materials
- Grant writers
- Information systems support (technical support to maintain and improve the Habitat Work Schedule and to create and update watershed websites)
- Writers to create stories of success and newsletters for stakeholder engagement
- Skilled planners (or access to consultants) to create new habitat protection incentive programs for deployment around the ESU.

Organizations that might be able to provide such services include the PSP, GSRO, RCO or a new nonprofit organization. Without significant advancements in staffing levels, each watershed will continue to fall behind the expected 10-year pace. Chronic understaffing of these programs has other, unintended consequences too. Some of the watersheds have experienced high staff turnover, and burnout is a continuing concern. Where local governments have provided the staff necessary to support a Lead Entity's program work, many have had to lay off staff or reduce positions to half-time due to funding shortages, causing experienced staff to seek employment elsewhere. Many Lead Entity Coordinators reported that they are concerned about "brain drain" as valued employees left or retired, with no transfer of their knowledge to the next generation of staff.

The Lead Entity staff uniformly reported feeling a significant increase in regional mandates associated with implementing and integrating both their salmon recovery work and the PSP's Action Agenda, with no new staff to support this work. Nearly all watersheds acknowledged and were grateful for the role that the PSP currently plays in seeking additional funding for watershed programs and capital projects. When asked what role the PSP's watershed liaisons (also called "Ecosystem Coordinators") play in were helping to advance their work, responses were mixed. Nearly all reported having a good rapport with their liaison, but some staff wanted their liaisons to do more. The type of support desired

ranged from fulfilling one or more of the core program staff positions and central service items listed above, to providing more sophisticated political support, including using the PSP's influence to bring absent federal or state agencies to the table.

### **Implementation Tracking Tools are Limited**

Projects (capital and programmatic) are tracked using different approaches by each watershed, but all use two tools: the 3-Year Work Program Schedule and the Habitat Work Schedule ("HWS"). Each has its strengths and limitations, which make tracking recovery work more difficult.

The HWS is a database that links to an on-line map-based information system created by the WDFW. It shows current and past capital restoration project activity by watershed and is available to the public. However, it cannot be used to generate reports at this time that would allow a person to summarize the totality of the work in any area. Additional features are expected to be added to the HWS to improve its usefulness to project managers and the public over time.

The 3-Year Work Program Schedule was created by the Shared Strategy during the earliest years of Recovery Plan work to track capital restoration projects and programmatic actions and ensure consistency with Recovery Plan goals and strategies. The 3-Year Work Program is updated annually and includes a narrative summary by each watershed of the changes that have occurred since the last report, a description of the progress made and the challenges faced by the watershed during the reporting period and any other information important to convey to the PSP and the RITT, who review and comment on the annual summaries. One significant limitation in the 3-Year Work Program reporting system is that the watersheds use the report and attached schedules differently from one another. For example:

- There are those watersheds that track their entire capital and programmatic plan components on the 3-Year Work Program schedules, even those actions that won't be accomplished for many years to come. Conversely, there are a number of watersheds who only use it to show what they believe can be accomplished within the 3-year timeframe that the report covers. All other actions are left off the schedule.
- A few watersheds track projects that are completed; others remove a project from the schedule once it is completed.
- Some only show capital projects, not programmatic efforts.
- Funding estimates vary widely. Some watersheds only fill in funding boxes on the 3-Year Work Program Schedule when the funds are expected to be received with a high degree of certainty, and within the 3-year time frame. Others simply estimate the total cost of the work and list potential funding sources they may ask for the funds, with no certainty as to whether the funds will be received.
- Some watersheds use a color-coding system to convey information on the status of projects, but all of them use different colors meaning different things.

The net result of this variability in the use of the 3-Year Work Program is that it makes it very difficult to track implementation across the ESU with any systematic approach. The variability also reduces the transparency of the watersheds' efforts to the public, where they may not be privy to how each watershed uses the report. Many watersheds find this tool to be useful in helping them track their activities, but others only do the minimum required. Nearly all watersheds interviewed complained that the time, energy and coordination that is required to track and maintain these two reporting systems is

significant and a drain on their limited staffs. They welcome any improvements that can be made that will help alleviate this burden.

Finally, apart from RITT review, there has been no formal follow up with watersheds that had incomplete plans at the time the Recovery Plan was adopted, where they have added new strategies as the result of additional research or planning work. The HWS and 3-Year Work Program remain the only tools currently available for reporting changes to the original recovery plan strategies. NMFS has not defined the process for updating the Recovery Plan, although it called for the creation of regional and local adaptive management plans as part of the NOAA Supplement to the Recovery Plan. Given that NMFS expects the Recovery Plan to be adapted over time, NMFS should work with the watersheds to determine the best process for documenting such changes.

## IV. Conclusion and Recommendations

The Recovery Plan was built on several pillars, including habitat protection and restoration, harvest and hatchery reforms and rebuilding efforts (the “H’s”). It was created using a collaborative model to agree upon voluntary improvements in habitat conditions, and linked to the negotiated agreements involving harvest and hatchery practices, which balanced Chinook Salmon recovery needs with well-established Tribal treaty rights. Five years into the effort, this assessment attempts to understand how well those pillars are being implemented, where we find success and where more support, funding or effort is needed to achieve the Recovery Plan’s 10-Year goals.

There are reasons to celebrate success across all of the H’s. Although we cannot state them all, a few notable reasons include:

- ✓ The Co-Managers met or exceeded the harvest management performance measures required in the 2004 Harvest Management Plan.
- ✓ The WDFW completed its 21st Century Salmon and Steelhead Initiative, which will help the Department identify, monitor and evaluate long-term, science-based hatchery management strategies.
- ✓ Despite a severe recession, significant change in the organizational structure supporting Puget Sound salmon recovery, a loss of staff and severe funding shortages, local commitment to salmon recovery across the ESU remains firm and vibrant.
- ✓ The Nisqually watershed completed a major portion of their largest project, the Nisqually Refuge Estuary Restoration Project, with the support and contribution of funds from other South Sound watershed groups.
- ✓ The Elwha River Dam removal project is finally funded and scheduled for demolition next year. Numerous high priority habitat restoration projects have been accomplished across every watershed in Puget Sound.

As with any undertaking of this scope and magnitude, some adjustments also need be made to ensure that the effort continues to move toward the 10-Year goals set forth in the Recovery Plan. Based on the assessments performed for this report, some conclusions can be stated about the status of Puget Sound habitat, as well as the programs being used to implement the Recovery Plan. Where appropriate, we also offer NMFS our recommendations for addressing issues found during the assessment process.

1. **Habitat is still Declining.** Key indicators addressed by the PSP's 2009 *State of the Sound Report* tell us that important habitat for Chinook Salmon is still declining, despite the ESA listing over 10 years ago. As such, the region needs to increase its scrutiny of the sources of habitat decline, and the tools we use to protect habitat sites and ecosystem processes. Habitat status and trends monitoring at the population, major population group and ESU scales is urgently needed and should be a priority focus for funding. In addition, the effects of climate change on the assumptions made in the Recovery Plan needs to be analyzed and discussed across the ESU. Where indicated, new strategies and action should be created to address impacts from climate change.
2. **Habitat Protection Needs Improvement.** The recovery effort is relying heavily on the protection of remaining habitat within the ESU, using a mix of regulatory and incentive programs. As noted above, key indicators show that habitat is still declining. No studies have been performed to analyze the effectiveness of the protection tools described in the Recovery Plan. We note that many of these protection tools are the same ones that have been implemented since the mid-1990s or even earlier, and their existence did not forestall the ESA listing of Puget Sound Chinook Salmon.

In addition, efforts to develop the regional strategies and actions called for in Chapter 6 of the Recovery Plan are largely nonexistent. These include:

- The Protection of Existing Physical Habitat and Habitat-Forming Processes
- The Protection and Restoration of the Nearshore, Puget Sound and Pacific Ocean
- Water Quantity – The Strategy for Achieving and Protecting Instream Flows
- Water Quality Strategies
- Commercial Forestry Strategies
- Commercial Agriculture Strategies
- Research, Monitoring and Adaptive Management

Additionally, local Lead Entities and regional groups such as the PSP or Recovery Council are not advocating for stronger regulatory programs to protect habitat at the federal, state or local level, largely based on socio-political factors. NMFS can help by (a) Defining the necessary level of critical habitat required to ensure the recovery of Chinook Salmon and other listed species across the ESU; (b) Assessing the effectiveness of various protective regulations; (c) Using its legal authority and other tools to ensure that protection programs are being properly implemented and enforced; and that regulatory updates are completed within statutory deadlines, or at a minimum, within a reasonable future time.

3. **Habitat work is underway, but heavily weighted toward capital projects.** Habitat managers within the 14 Watersheds are implementing the strategies defined in the Recovery Plan, but at this stage of implementation, the work is heavily weighted toward capital habitat restoration activities. Non-capital programs are just as important for the success of the Recovery Plan, but funding sources tend to favor capital projects, and disfavor the funding of staff necessary to perform the work.
4. **Funding levels are inadequate to fully implement current 3-Year Work Programs.**
  - Although state and federal funding has steadily increased for implementation, it lags behind what is needed to fully fund the Recovery Plan. Today, the Lead Entities report having only 20% of the funding they need to complete the habitat capital and non-capital

work identified in the 3-Year Work Programs. Currently, the 3-year effort is estimated to cost \$1.7 billion and only \$339 million is available.<sup>58</sup>

- **Most Watersheds report that they are behind the expected pace of implementation** at this five-year mark, mainly due to a lack of funding and inadequate numbers of staff.
- **Watershed leaders believe that grant local matching requirements are too rigid and unnecessarily limit their work.** The staff believes that they can do a better job of implementing their programs and projects if they are simply given the funding needed for projects and programs and held accountable for the results. They find that a tremendous amount of their time and energy is now being devoted annually to the bureaucracy that has sprung up around capital and non-capital funding. They also feel pressed by increasing mandates to maintain the 3-Year Work Programs and the Habitat Work Schedule (HWS) and participate in other regional programs. These administrative duties place an increasing burden on staff, which are often overloaded trying to accomplish their substantive work on salmon recovery. Efforts should be made to address these administrative issues.
- **Staffing for core habitat programs remains insufficient and hampers implementation.** The Lead Entities consistently state that they lack adequate staffing resources to fully implement their Recovery Plans. Most Lead Entity organizations are run with only one or two paid staff. They have identified core staffing needs that include the following staff to ensure all priority programs and projects are timely implemented:

Core Watershed Program Staffing Needs

- Program Director (typically, the lead entity coordinator)
- Program Planner/policy support person (trained in land use planning; develop new strategies, participate in protection programs)
- Restoration/Acquisition Project managers (manage or supervise construction projects, land acquisition negotiations and real estate transactions)
- Outreach and education staff (develop programs and marketing materials, build community relationships and support, lobby opinion leaders and legislators)
- Clerical support staff (schedule meetings, take minutes, coordinate work)
- Biologists, ecologist or other technically-trained staff (for project development and review, status/trends monitoring, other field work)

They also described an additional set of program support services that are very important, but it may be possible to perform these services at at the regional scale to provide efficiencies and cost savings. These services included:

Central Service Needs:

- Group purchasing of supplies and equipment for offices, projects and programs
- Highly skilled meeting facilitators
- Annual design and publishing of marketing and outreach materials
- Grant writers
- Information systems support (technical support to maintain and improve the HWS; and to create and update watershed websites)
- Writers to create stories of success and newsletters for stakeholder engagement;

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<sup>58</sup>See, Watershed 3-Year Work Programs, available at [www.psp.wa.gov](http://www.psp.wa.gov)

- Skilled planners (or access to consultants) to create new habitat protection incentive programs for deployment around the ESU.
5. **The Adaptive Management Plan has not been completed. In its absence, there is no process in place to recognize changes to Recovery Plan strategies.**
- Apart from RITT review, there has been no formal follow up with watersheds that had incomplete plans at the time the Recovery Plan was adopted to acknowledge their completion, and to examine new strategies that have been added as a result of additional research or planning work. The HWS and 3-Year Work Program remain the only tools currently available for reporting changes to the original Recovery Plan strategies. NMFS has not defined the process for updating the Recovery Plan, although it called for the creation of regional and local adaptive management plans as part of the NOAA Supplement to the Recovery Plan. Given that NMFS expects the Recovery Plan to be adapted over time, NMFS should work with the watersheds to determine the best process for documenting such changes, and should work with the RITT to expedite the completion of the Adaptive Management Plan.
  - Additionally, efforts that began five years ago to create the regional framework for the Adaptive Management Plan for the Recovery Plan appear to have ceased at the end of 2007. NMFS should ensure that the regional framework for adaptive management is completed as called for in the Supplement to the Recovery Plan. Additionally, the Lead Entities are being held responsible for creating local Adaptive Management Plans that will fit within the larger regional framework, **but the promised funding and support to engage in this work has not been provided to them by the region or NMFS.**
6. **The Harvest RMP is being implemented as planned. NMFS has concluded that the harvest limits** established in the Harvest RMP have been followed for all 22 populations since its adoption. In terms of the performance of the population under the Harvest RMP, total natural escapements for 11 of 19 populations (and one management unit for which there are rebuilding thresholds), met or exceeded the established thresholds from 1999-2008.<sup>59</sup> In terms of the level of effort expended in implementing the Recovery Plan, the Co-Managers have implemented a significant amount of monitoring and reporting, and this work is on-going each year. Canadian and Alaskan harvests continue to account for a substantial proportion of harvest for many Puget Sound Salmon, but the harvest is consistent with the terms of the 2008 Pacific Salmon Treaty Annex. As the timeframe of the initial Harvest RMP comes to a close, work is now underway to renegotiate the Harvest RMP Plan between NMFS and the Co-Managers.
7. **The Hatchery program within NMFS is critically under-resourced.** As discussed above, over 100 HGMPs are still awaiting review and approval by NMFS. This limits the implementation of the Hatchery RMP. Additional staff should be added to this program to ensure that the goals of the Hatchery RMP can be accomplished in a timely way.
8. **H-integration and sequencing of various efforts remains challenging** to implement and requires more resources for all necessary parties to participate, including support from the RITT members.

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<sup>59</sup>S. Bishop, NMFS (September 2010). NMFS expects to release its analysis of the new RMP in the next few months. The information presented there will update (and may change) the information presented in this report.