How does it all add up into one comprehensive plan?

The regional salmon recovery plan in Puget Sound represents a conservation effort whose scope and complexity are unparalleled for any listed species under the Endangered Species Act in the U.S. The magnitude and complexity of the issues facing the salmon in a region with 3.8 million people are magnified by the expected increase of 1.4 million additional people by 2020. However, the current scientific knowledge about the fish and environmental conditions they need, along with the many entities and governments working on habitat, hatcheries and harvest, make it possible to achieve recovery over time.

In the next ten years, measures to protect the fish and their habitats will be most important to reverse the declining trends. Habitat restoration, hatchery enhancements and developing strategies to integrate the "H's" is also needed to create significant gains in the productivity of the environment and the fish. This first implementation phase will also lead to more scientific understanding through adaptive management and monitoring. In the next phase, year eleven and beyond, responsible parties across the region will need to hone and improve their efforts for habitat restoration, H-Integration and other activities that can accelerate our ability to help the fish survive and thrive over the long term.

Due to the scope and complexity of designing recovery strategies for salmon in Puget Sound, there are significant uncertainties that need to be addressed to ultimately move the fish to a level where there is a negligible risk of extinction. The regional plan is designed to address the uncertainty inherent in such an endeavor in 3 important ways:

- Increase certainty in plan outcomes as much as possible.
- Acknowledge in a transparent way that some uncertainties remain — and identify approaches to address those uncertainties where possible.
- Design the regional strategy to hedge against inevitable surprises, preserve options, and make wise decisions in the face of uncertainty.

There are fourteen different watershed planning areas in Puget Sound plus the marine waters and they each are unique. Not surprisingly, different watershed planning groups identified different long-term and short-term goals and proposed different suites of actions to achieve those goals. Most watersheds presently containing

Chinook populations stated that they are striving over the long term to achieve low risk status for their listed fish. A key factor in evaluating the likelihood of recovery for the whole evolutionarily significant unit (ESU) in the Puget Sound region is the certainty that the strategies and actions in every watershed will be biologically effective in reversing declining trends and moving their populations toward recovery.

Consequently during the May 2005 review process, the Puget Sound Technical Recovery Team (TRT) and the Shared Strategy Work Group together discussed the level of certainty for achieving plan outcomes, identified issues that need to be dealt with in order to increase certainty, developed recommendations for how to address those issues, and assessed whether the combined local and regional plan elements will meet ESA recovery plan requirements.

The foundation for the review process was a technical analysis conducted by the TRT that focused on the scientific rationale underpinning strategies and actions identified in individual watershed plans (a written summary of the TRT technical rationale for the analyses and conclusions reached will be available later in the summer of 2005). The review assumed implementation — it did not evaluate the likelihood that strategies, actions or adaptive management would be implemented. Successful implementation will ultimately prove to be the most important determinant of success. Implementation commitments are not part of this regional plan, although there are several in the individual watershed chapters. Additional work on commitments will be carried out over the remainder of 2005.

The TRT and Work Group concluded that the Puget Sound Salmon Recovery Plan meets ESA section 4(f) requirements and the TRT recovery criteria (see below), and if implemented will put the region on a significant path toward recovery. The following summarizes the conclusions reached by the technical and policy reviewers.

How does this plan (combined watershed and regional components) meet ESA section 4(f) requirements?

In general, the Puget Sound Salmon Recovery Plan meets ESA §4(f) requirements as follows:

1. Objective, measurable criteria and goals are provided.
    a. The TRT developed ESU recovery criteria.
    b. All Puget Sound watersheds in this plan provided objective, measurable goals.
2. Site-specific strategies and suites of management actions tied to addressing key factors affecting the species are provided.
    a. Each watershed provided their own set of protection and restoration management strategies for specific sub-basins, river reaches, estuaries or nearshore areas tailored to the conditions of their watershed. As noted in the plan's watershed profiles (results and conclusions section), a regional review added recommendations to address specific issues to increase the certainty of achieving plan outcomes and contributing to overall ESU recovery.
    b. State and tribal co-managers provided management goals and actions for hatcheries and harvest in their respective watersheds. In most areas identified in the plan, there is more work to do to enhance or develop H-Integration strategies among the habitat, hatchery and harvest managers. A regional approach is recommended to enhance the integration at the individual watershed scale.
    c. There are a number of issues, like oil spills, that can only be effectively addressed at a regional scale. These are described in a regional strategy section of the plan. Regional strategies also address factors related to agriculture, forestry, and other land uses, the nearshore, water resource issues related to flows, assessing the effective-

ness of protection strategies and statewide co-manager strategies for harvest and hatchery management.

3. An implementation schedule is included in the regional plan. It describes strategies and actions most specifically for the first ten years of implementation. It identifies what will be needed beyond the first ten years in general terms but does not assign timeframes for specific actions over the longer term.
4. Cost estimates to carry out actions are provided in the financing strategy chapter of the regional document.
5. A chapter describing the key measures and elements of an adaptive management and monitoring program (AMM) is included in the regional document. Many watersheds have also included an AMM section in their plans. The implementation schedule calls for completing more detailed AMM frameworks at both local and regional levels by the end of 2005.

In general how does this plan, if implemented, increase the certainty that this region will start on a significant recovery path?

- By emphasizing the critical importance of protection strategies both to preserve existing ecological and biological functions, and to preserve options for restoration of habitat and salmon populations,
- By transparently identifying sources of uncertainty and recommending ways to reduce them,
- By highlighting the focus on actions needed early in the implementation phase to increase the certainty of their contribution to ESU recovery,
- Through the regional recovery criteria, which hedge against uncontrollable risks to populations by spreading the risk among five regions and where feasible, keeping options open at the outset for achieving long-term viability, and
- By developing an adaptive management and monitoring component that will track results and provide a path to modify the strategy as necessary (details of which are scheduled for completion by the end of this year).

How does this plan meet ESU recovery criteria?

As a reminder, the recovery criteria can be summarized as follows: The ESU will have a negligible risk of extinction if:

- All watersheds improve from current conditions, resulting in improving status for the fish.
- At least two to four Chinook populations in each of five bio-geographical regions of Puget Sound attain a low risk status over the long-term.
- At least one or more populations from major diversity groups historically present in each of the five Puget Sound regions attain a low risk status.

The May 2005 review by the TRT and Work Group of the Puget Sound watershed plans concluded that the plan meets the recovery criteria as follows:

All watersheds in all five regions need to improve from current conditions

All watershed plans contain strategies and actions that if implemented will improve the conditions in their basins.

Break-down by the five bio-geographical regions:

The five regions are the Nooksack, Whidbey Basin, Central/South Region, Hood Canal and the Elwha/Dungeness. To determine how well the plan meets ESU recovery criteria, the reviewers rolled up the analysis of the individual watershed plans into their respective regions. The conclusions from this roll-up analysis are summarized below.

Nooksack, Elwha/Dungeness and Hood Canal Regions

Three of the five bio-geographical regions have only two remaining Chinook populations within them. These are the Nooksack (includes the San Juan Islands), Elwha-Dungeness and Hood Canal regions. Both populations in each of these areas need to achieve low risk status over time to meet the ESU recovery criteria. Based on the materials provided by the watershed groups in these areas, the certainty of achieving low risk status in these areas is currently low because of the magnitude of change needed.

To increase the certainty of achieving ESU recovery criteria, the TRT and Work Group recommend that each watershed within these three regions of Puget Sound consider prioritizing or sequencing specific strategies within the next couple of years in their plans as described below. The reviewers assumed that each watershed's entire plan would be implemented over the long-term and that they would address recommendations from the review. However, certain priorities rose to the top for these three regions that the reviewers believe deserve early and focused attention:

- In the Nooksack, the proposed hatchery broodstock program for South Fork Chinook needs to be implemented immediately. Other priorities to address are habitat protection strategies and harvest by Canadian and Alaskan fisheries.
- In the Hood Canal, it is important to preserve future options for the Skokomish population, more fully integrate habitat, harvest and hatchery management for both Hood Canal populations, and coordinate the Chinook and summer chum plans.
- In the Dungeness basin, the priorities are to address high and low flows, and to integrate the hatchery and habitat actions. In the Elwha basin, the top priority is to develop and implement a robust adaptive management and monitoring program. In both the Elwha and Dungeness basins, harvest by Canadian and Alaskan fisheries needs to be addressed.

The Whidbey Basin and Central/South Regions

Two of the bio-geographical regions have multiple Chinook populations. The Whidbey Basin region, which includes the Skagit, Stillaguamish, Island and Snohomish watersheds, has ten remaining populations. The Central/South region, which includes the Lake Washington/Cedar/Sammamish, the Green/Duwamish, the Nisqually, East Kitsap, South Sound and the Puyallup/White watersheds, has six populations remaining. These two regions, therefore, have more choices (with the exception of the remaining early-run Chinook in the White river basin) as to which populations ultimately need to achieve a low risk status in order to meet ESU recovery criteria. The role these populations will play in ESU recovery will clarify after the first ten-year implementation phase, and will depend upon how well the first ten years of actions are implemented and on execution of a solid adaptive management and monitoring program.

The Whidbey Basin Region

In the Whidbey Basin region (Skagit, Island, Stillaguamish and Snohomish watersheds), the actions taken in the next ten years are likely to be the same whether the long-term watershed goals are aimed at improving from current conditions or achieving low risk status. Ultimately, at least one of the early returning Skagit populations plus at least one late run population from within the region will be needed to achieve low risk in order to meet ESU recovery objectives.

The Whidbey Basin needs to keep all its options open at this time to hedge against uncertainties in the other regions for achieving low risk populations such as the Nooksack, Hood Canal, Elwha/Dungeness and the White River populations. It is also

likely that the Whidbey Basin populations historically were a core production area for the whole ESU. The TRT believes that restoring ecological processes in all four of the Whidbey Basin watersheds--as planned in the first ten years--will benefit all Puget Sound Chinook populations. From an ESU perspective, all of the watershed plans in this region will provide improved anadromous fish functioning in both fresh and salt water and improved estuarine and nearshore functions.

The reviewers identified priorities for Whidbey Basin watersheds to consider in the next ten years to make the most of this first phase to help their area and assist the ESU in getting on an aggressive recovery path. Again, as previously stated for the other regions, the assumption is that the entire suite of strategies and actions identified in the plans will be implemented, but that some issues, identified below, deserve a special focus.

- In the Skagit, there are six Chinook populations which each have an opportunity to achieve low risk status over time because of this watershed's relatively good ecological integrity and the chance to restore habitat-forming processes at the watershed scale. While all six populations are likely to benefit from the ten-year plan, the early-run populations are particularly important for ESU recovery. In the near term, the priority for the Skagit watershed is to ensure protection of existing habitat functions and initiate restoration efforts for the benefit of all Skagit populations.
- The Stillaguamish has two populations-the North Fork and South Fork. The watershed's goal is to achieve low risk for both populations, but there is low certainty, especially for the South Fork, of being able to achieve this status. This is due to the magnitude of changes needed to restore habitat-forming processes in the watershed. There is slightly more certainty for the North Fork population because of its somewhat better status and the likelihood that early habitat actions will produce the needed improvements. The populations in the Stillaguamish watershed provide connectivity and if the plan is implemented as stated, the improved watershed functions will help preserve recovery options for the Whidbey Basin. The top priorities for this watershed in the near-term are to address flows and to improve the connection with forest managers to address hydrology and sedimentation issues.
- The Snohomish provides the ESU with an opportunity to test the possibility of achieving low risk status for two populations in an urban and urbanizing area. One of the most important priorities for this watershed is to determine the results for fish from habitat protection actions. Aggressive habitat restoration planned in the next ten years will also increase the certainty in the plan's outcomes. For these reasons, the watershed is encouraged to rapidly implement their plan as described.

The Central/South Basin Region

The Central/South Basin (Lake Washington/ Cedar/Sammamish, Green/Duwamish, East Kitsap, Nisqually, South Sound and the Puyallup/White watersheds) has the widest range of conditions compared to any of the other geographic regions in Puget Sound. The conditions range from the largely intact Nisqually River basin to the dramatically altered hydrology of the Lake Washington system. There is also a wide range within the more urban watersheds--conditions range from the nearly pristine upper areas of the Cedar and Green rivers to the most intense urban conditions of the lower Duwamish and Puyallup rivers through Seattle and Tacoma.

Each watershed in this region needs to make significant decisions as identified in their plans and from the May 2005 analysis before it will be possible to evaluate the likelihood of achieving long-term goals for this region's populations. In the meantime, to meet ESU criteria, all populations in

this region have to at least improve from current conditions. From an ESU perspective, the watershed plans in this region will provide improved anadromous fish functioning in both fresh and salt water and improved estuarine and nearshore functions.

As with the other regions, the TRT and Work Group highlighted a near-term focus for each of the South/Central watersheds to increase the certainty of achieving their plan outcomes and fulfilling their contributions to the ESU.

- The Lake Washington/Cedar/Sammamish watershed has the largest human population in the state and the most altered "plumbing" system. From an ESU perspective, improving current conditions within the constraints of this watershed as planned will provide important ecological benefits to the ESU by increasing the ecological functions provided by anadromous fish. It also has the opportunity to preserve a lake-rearing Chinook diversity type, and provides a chance to test re-colonization as a recovery approach above the Landsburg Diversion dam.

  The near-term priorities for this watershed are to integrate the "H's" as soon as possible (agree on goals and address the Issaquah hatchery and Sammamish Basin and Cedar habitat issues). Also protection of the remaining habitat, and restoration efforts to protect the Cedar River Chinook population, as stated as a priority in their plan.

- The Green/Duwamish watershed is another highly altered river system in the Puget Sound region. It is dominated by a hatchery system whose main objective is to provide harvest opportunities. Currently the habitat conservation plan and hatchery and harvest management plans have not been integrated to increase the likelihood of recovery. This creates high uncertainty for the watershed's ability to achieve a low risk status for its Chinook population.

  The recommended near-term focus for this watershed is to protect and improve spawning and rearing in the middle watershed and reduce harm as the fish migrate through the lower reaches of the Duwamish River. In addition, to increase the chances of recovery, the watershed's managers will need to agree on goals and develop an H-Integration strategy. Meanwhile, improvement from current conditions will provide ecological services to the ESU by improving anadromous fish functions and contributing to the health of freshwater, estuarine and nearshore ecosystems.

- The White River Chinook is the only remaining early-run population in the South/Central region, and as such it needs to achieve low risk status over time to meet ESU recovery criteria. The certainty of achieving this status is low. Improving the current status of the Puyallup population will provide ecological services to the ESU by improving anadromous fish functions and contributing to the health of freshwater, estuarine and nearshore ecosystems. To increase certainty of achieving plan outcomes and ESU contributions, the identified priorities for both populations in this watershed include the need for habitat planners and co-managers to agree on goals, develop an H-Integration strategy, address flows, and secure restoration opportunities in the lower river and estuary.

- The Nisqually watershed has the best remaining ecological integrity relative to the other watersheds in this region, and their plan articulated the clearest path in this region for achieving low risk status for their population. For this reason, it has the greatest chance of achieving low risk for its population if the hatchery and harvest management strategies are managed in conjunction with the habitat strategy.

Watersheds without independent spawning populations

The remaining four watersheds not yet discussed (although they also reside within the above regions as indicated), do not have independent spawning

populations. These watersheds are the San Juan Islands, Island County, East Kitsap and the South Sound. They support Chinook during several life stages. Their primary contribution to ESU recovery is to support current ecosystem functions and processes in their freshwater tributaries, and estuarine and nearshore environments.

The main priority for all four of these watersheds is to protect current habitat functions through existing strategies and to improve protection over time as more is learned about how fish use their waters and how ecosystem processes are supported by key estuarine and nearshore habitats. East Kitsap and South Sound watersheds, because of the hatcheries in those areas, would also improve the chances of ESU recovery by developing regional H-Integration strategies.

Conclusion

Upon completing their review of all the local watershed plans and regional (cross-watershed) elements, the TRT and Work Group concluded that the Puget Sound Salmon Recovery Plan is solid and credible. The reviewers are confident that the work done to date (combined local and regional) sits on a solid scientific foundation. Work scheduled for the next six months (completion of the local and regional adaptive management and monitoring plan and adding to implementation commitments,) and addressing the priorities identified above in the early implementation stages will increase the certainty of achieving desired results. If implemented, the policy and technical reviewers believe that this plan (combined local and regional elements) will put the region on a significant path towards salmon recovery.