

Guidance for Evaluating SRFB Nearshore Assessments

By
The Screening Committee¹
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1 Introduction

SRFB has asked for two pieces of information:

1. How are nearshore (marine/estuarine) “assessments” going to inform SRFB to select projects that will result in salmon recovery?
2. How will funded nearshore (marine/estuarine) “assessments” inform PSNERP/NST?

In addition we believe it important that the above elements be integrated into watershed level salmon recovery efforts and regional salmon recovery planning.

Guidance on Watershed Assessment for Salmon (JNRC, 2001) provides an excellent framework for defining and evaluating assessments of salmon restoration efforts. Although watershed analysis has traditionally been oriented toward freshwater systems, this framework can be easily adapted to estuarine and nearshore assessments. The document already contains some guidance for these environments.

The document describes three stages of assessment:

1. Habitat Conditions
2. Causes of Habitat Conditions and habitat-forming processes
3. Salmon Response (links between habitat and salmon production)

Given the incomplete and limited number of nearshore assessments to date, our scant knowledge of habitat and habitat forming processes in the marine environment, and the poor understanding of salmon use of estuarine and nearshore areas, we expect that many current nearshore assessments will lean towards compiling existing information and completing *Stage One* assessments. Subsequent improvements to our understanding of nearshore processes and of salmon linkages will allow Stage Two and Three assessments.

Stage One assessments 1) describe watershed and habitat conditions, 2) describe stock status and trends, and 3) synthesize information.

The types of information and the possible sources of information for nearshore/estuarine projects differ in many ways from those for freshwater/watershed environments, although general similarities exist. Historical information, physiographic data (topography/bathymetry), geomorphological description, and biological data are all important.

Descriptions of the status and trend for each salmon stock will tend to become more complex as the assessment focus moves from the upper watershed and spawning life stage to larger scales; lower mainstem, estuary, and nearshore environments; and multiple life history stages and trajectories. The general, and largely qualitative, stage 1 level stock descriptions for estuarine and nearshore environments will likely be most useful as a mechanism to acknowledge the above and the importance of the nearshore to sustaining the abundance, productivity, diversity, and spatial distribution of multiple salmon species and population components (ie. subpopulation, population, and ESU level population structural elements).

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Stage One assessments will generally rely on existing data. *Where new data is to be collected*, it should provide for the following:

- Verify existing datasets (where the value of validation is justified)
- Evaluate specific sites where recovery actions are, or may be, proposed
- Evaluate the success of existing recovery efforts within the assessment area
- Directly inform identification or prioritization of recovery actions
- Establish baseline for evaluating/monitoring of proposed (specific?) recovery actions.

The focus of estuarine and nearshore assessments should ideally support not only analysis of prioritization between restoration projects, but should also support analysis of prioritization of restoration, acquisition and regulatory protection as well. Then, from that big picture conservation or recovery context, estuarine and nearshore assessments would provide a tool for the various players to coordinate and prioritize their actions to maximize the use of available funds.

2 Project Identification and Prioritization

Different assessment stages lead to different types of potential restoration actions. We recognize that Stage One assessments may be limited in their ability to guide specific restoration actions, although it is likely that even a Stage 1 evaluation of habitat conditions can lead to identification of areas and sites where habitat has been adversely modified in clear ways and where restoration choices may be clear (e.g. the filling of the estuary or even the smallest streams, tidal gates, or the construction of large jetties across the nearshore without allowances for fish passage). The general knowledge and descriptions of salmon life histories and trajectories supported by nearshore habitats appear to be adequate to serve as useful guidance to stage 1 level habitat assessments and associated potential restoration actions that have been and are being conducted in estuarine and nearshore environments.

Stage One assessments may also be useful for identifying areas in relatively natural or unaltered condition where protection or preservation-based actions (acquisition, easements) may be strongly indicated.

Restoration actions must be sustainable- i.e., the ecological processes that create and support habitat must be understood and functioning before some types of restoration are attempted, for example, transplanting eelgrass into areas where water quality may no longer support eelgrass growth.

3 Data Management

- Assessments are generally expected to include both descriptive narrative and map presentations.
- Maps should be prepared at comparable scales and in compatible formats to allow direct comparisons of nearshore characteristics, and where appropriate, more detailed geographical analyses.
- Data products should be broadly accessible to both participants within an assessment area and to those conducting assessments in adjacent areas.
- Data should be available to groups conducting assessments at both finer and at more regional scales
- Data should be available to local planners and watershed groups.
- Dissemination of data to various user groups will require dedicated staff.

Assessments and restoration projects should be designed to increase knowledge and inform salmon recovery efforts at the watershed level as well as to inform regional salmon recovery

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efforts. This comes through an adaptive management approach (See Figure 1) that includes monitoring and research.

Monitoring should be driven by specific questions, goals and objectives and should determine if restoration goals are being met.

The use of assessment information as monitoring baseline or reference site information should be considered. This will make each round of proposals more effective and move from being assumption-driven to evidence-based.

Data gaps and research needs

Assessments should include recommendations for further data gathering efforts, based on an evaluation of data gaps, monitoring, and of research needs. These should be fairly specific. General scientific problems or weaknesses in knowledge are generic to many areas and do not result in actionable projects. Data gaps should be particularly relevant to salmon habitat and conditions within the assessment area (e.g. historical information about salmonid use of small coastal streams within the analysis area, completion of spotty forage fish and eelgrass surveys).

As assessments continue, make sure that they address Stage II and III needs- causes of conditions and salmon response.

4 Recommendations for Categories of Projects

The Watershed Assessment document (JNRC, 2001) contains some information on nearshore/estuarine projects, both in the E/M section on page 34, and in the acquisition and riparian sections. See Appendix B for an approach based on this document. This list is not exhaustive- it is given as an example, using the existing project proposals before us.

5 How will the Assessments inform PSNERP's NST?

The NST has not fully addressed how to answer this question. It is expected that they will be critical in providing information for the Conceptual Model.

6 How will the above elements be integrated into regional salmon recovery planning?

The question of how much estuarine habitat is needed where to achieve an acceptable level of ESU recovery for Puget Sound salmon, including bull trout, is the nexus between recovery planning and PSNERP. The Shared Strategy goal for recovery is self-sustaining populations of salmon at harvestable levels. The nearshore habitat assessments need to be designed so that the outputs can be used by the Shared Strategy to model populations and ESU viability based upon various watersheds recovery scenarios. The PSNERP restoration project limiting factors analysis and the evaluation and monitoring will likely not be viewed as complete without a linkage between the project and the status and trends in Puget Sound salmon populations.

The Puget Sound Technical Recovery Team (TRT) (<http://www.nwfsc.noaa.gov/cbd/trt/>) and the federal Recovery Unit Team (RUT) established by U.S. Fish & Wildlife Service to define recovery for bull trout are working with the Shared Salmon Strategy (<http://www.sharedsalmonstrategy.org/>) to develop a recovery plan for Puget Sound salmon. The members of the Shared Strategy have agreed to a process by which a recovery plan will be developed in 5 steps, focusing initially on ESA listed species.

Step 1—to develop an outline for the recovery plan that addresses the needs of the Endangered Species Act (ESA) and broader regional goals—is complete. In Step 2, the TRT and RUT are now working with the Shared Strategy to articulate draft targets for recovery for populations of

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Chinook, summer chum and bull trout in Puget Sound. These fish-based targets—termed recovery planning targets—are designed to be used in Step 3 of the Shared Strategy process.

In Step 3, individual watersheds around Puget Sound are asked to participate in a voluntary and collaborative process to develop a recovery plan. Local governments, watershed groups, and marine groups from each watershed are asked to work with the state, tribes, and federal Services to identify the actions necessary to attain the planning targets and reach consensus on how to implement those actions. This includes conducting necessary analyses to determine what magnitude of effort (in habitat actions) is needed to achieve population specific targets for recovery. Estuarine and nearshore habitat actions will also need to be considered, as part of, or concurrent with, these analyses. Additional effects of hatchery and harvest management on achieving planning targets in watersheds must also be accounted for in Step 3.

Steps 4 and 5 of the Shared Strategy process include agreeing on recovery actions across the Puget Sound region and documenting how they will be sufficient for ESA and to achieve the recovery planning targets. As part of Step 3 of the Shared Strategy process, the NMFS general guidance on salmon recovery planning, viable salmon populations (VSP), and ecosystem recovery planning for listed salmon (SHRP) (NMFS. 2000., McElhane et al. 2000., Beechie et al., 2002.) will need to be translated into specific recovery criteria and guidance for the watersheds including the associated nearshore.

7 References

Beechie, T.J., P. Roni, and E. Ashley Steel (eds.). 2002. DRAFT- Ecosystem Recovery Planning for Listed Salmon: An Integrated Assessment Approach for Salmon Habitat. Northwest Fisheries Science Center, NMFS, Seattle, WA 196 p. available for comment at <http://www.nwfsc.noaa.gov/ec/wpg/documents/OnlineReview.pdf>

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Lower Columbia River Estuary Program. 1998. Lower Columbia River Estuary Plan- Volume 2: Aquatic Ecosystem Monitoring Strategy for the Lower Columbia River, Information Management Strategy. Portland, OR.

McElhany, P, et al., 2000. Viable salmonid populations and the recovery of evolutionary significant units. U.S. Dept. Commerce, NOAA Tech Memo. NMFS-NWFSC-42. 156 p.

National Marine Fisheries Service. 2000 draft. Recovery Planning Guidance for Technical Recovery Teams. 15 May 2000 Draft, 25 p.

Roni, P. et al., 2002. A review of stream restoration techniques and a hierarchical strategy for prioritizing restoration in Pacific Northwest watersheds. North American J. Fisheries Mgt. 22:1-20.

Salmon Recovery Funding Board. 2000. Report to the Salmon Recovery Funding Board on Marine Nearshore Habitat Issues, Efforts, and Funding Options. Olympia, Washington, November 21, 2000. 25 p.

Salmon Recovery Funding Board. 2001. Policies and Project Selection Grants Manual. Publ. #18. July 2001. Olympia, Washington. 22 p. <http://www.wa.gov/iac/downloads/Manual%2018.pdf>

Salmon Recovery Funding Board. 2001. Third Round 2001 Salmon Applications Instructions. Publ. 18b. Olympia, Washington. 30 p.

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Puget Sound Technical Recovery Team. 2002. Planning Ranges and Preliminary Guidelines for the Delisting and Recovery of the Puget Sound Chinook Salmon Evolutionary Significant Unit

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Appendix A- Glossary

Watershed assessment: a scientifically-based approach to understanding how a watershed works; technical efforts that describe ecological processes, potentials, functions, and conditions at multiple spatial and temporal scales, to identify and analyze causes and effects after a period of change. (From GSRO, May, 2001)

“A watershed assessment is simply a tool that helps us understand how a watershed "works," how it has changed as a result of human activities, how it may change in the future, how those changes affect salmon and their habitat, AND [emphasis added] what needs to be done AND [emphasis added] where to protect and/or return the habitat to a healthy state for salmon.

A watershed assessment addresses the following key questions:

1. what habitat conditions are limiting salmon production?
2. what processes or land uses are causing the habitat conditions?
3. what linkages exist between salmon and habitat conditions? "

From Questions and answers: Guidance on Watershed Assessment for Salmon”, (GSRO, May 2001)

Inventory- Defining the spatial extent of a population, resource, or ecological process. A map, a snapshot in time, a survey.

Survey- An inventory.

Marine nearshore areas: include intertidal estuarine and marine areas, shallow subtidal areas, supratidal areas (the area directly adjacent to marine influenced areas), and tidally-influenced portions of rivers and streams (e.g., deltas, river mouths). Some characteristic nearshore habitats include marshes, wetlands, tidal channels and sloughs, mudflats and sandflats, seaweed beds, seagrass meadows, kelp forests, unvegetated rocky or sandy beaches, riparian forests, and the water column itself. (From GSRO, May, 2001)

Monitoring-

A temporal analysis of trends of a population, resource, or ecological process. Is performed at several scales. Monitoring should be driven by specific questions, goals and objectives. Monitoring should determine if restoration goals are being met.

1. **Implementation monitoring** - actions taken to determine whether the objectives and strategies ... are being implemented as written, and/or modified through the adaptive management process in ways consistent with ... goals and objectives. A substantial part of this is "tracking" “Did we do what we said we would do?” compliance, scale of individual project-
2. **Effectiveness monitoring** - actions taken to determine whether implementation of the objectives and/or strategies ... are producing the conditions expected. “Are we creating the habitats we promised?” include processes- most important part of monitoring, limitation of most other monitoring plans (see Skagit plan)
3. **Validation monitoring** - actions taken to evaluate cause-and-effect relationships between the specific resource conditions that result from applying specific strategies and the process(es) they were intended to benefit. “Are there more fish/birds/etc.?” performance, large scale

Adaptive Management- Adaptive management is a process whereby research and monitoring are used to allow certain projects and activities to proceed, despite some uncertainty and risk

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regarding their consequences (Holling 1978;Walters 1986; Walters and Holling 1990). It recognizes that while we know much about the Puget Sound ecosystem, there is also much that we do not know. Thus, in the adaptive management process, emphasis is placed on learning about the affected ecosystem (in this case Puget Sound) and in order to learn, actions are designed as experiments to evaluate ecosystem responses. The overall intent of this process is to reduce the risk and uncertainty associated with future actions. Two critical components of adaptive management are a direct feedback loop between science and management and the view that the actions taken are experiments (Fresh, 2002)

Designing monitoring and assessing progress toward meeting objectives and incorporating what is learned into future management decisions. (From GSRO, May, 2001)

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8 Appendix B- Framework For Nearshore Assessment Needs

This framework for describing the nearshore assessment needs is patterned after JNRC's "Guidance on Watershed Assessment for Salmon"

Each area of the Puget Sound and Washington Coast is at different stages of data acquisition and analysis. The Stages outlined below attempt to describe the full gamut of what is needed for a complete "Nearshore Assessment for Salmon". In general, STAGE I elements (Steps 1 - 3) should be completed before engaging in Stage II – IV activities.

Examples given here are examples only and does not constitute an exhaustive, complete, or prioritized list.

Stage I – Inventory Habitat Conditions – documenting what is there now!

Step 1 - Describe the Physical and Biological Characteristics of the Estuary and Nearshore

- A. Shoreline structures – e.g. armoring, dikes, jetties, fill, tide gates, overwater structures, and etc.
- B. Slope/bluff conditions- landslide activity, toe erosion, slope stability, steepness/height
- C. Upland and aquatic uses – only as they affect nearshore processes
- D. Beach substrate (Sediment type) (Accretion shoreforms)
- E. Large woody debris
- F. Identifying and mapping salmon forage fish stocks and spawn deposition areas.
- G. Intertidal and subtidal flora and fauna (e.g. Eelgrass beds/Kelp)
- H. Riparian/upland vegetation - only as they affect nearshore processes

Step 2 - Describe the Salmon utilization of the Estuary and Nearshore areas

- A. Where and When they are present- habitat accessibility

Step 3 - Synthesize Information

- A. Assemble written reports and existing data including, GIS data, maps, inventories, videos, aerials, government records, studies and literature of current nearshore habitat conditions and characteristics
- B. Document Historic Habitat Conditions

Stage II - Causes of Condition – document changes that lead to the current condition!

Step 1 - Describe Changes to Habitat-forming Processes

- A. Shoreline configuration and Geophysical processes
- B. Create sampling units for nearshore processes
- C. Energy characteristics
- D. Sediment Connectivity

Step 2 - Synthesize Information

Stage III – Predict Salmon Response.

Step 1 - Define Salmon Life History and Habitat Relationships

Step 2 - Synthesize Information

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SUGGESTED ELEMENTS AND PROTOCOLS FOR STAGE I PROJECTS

- Step 1 - Describe the Physical and Biological Characteristics of the Estuary and Nearshore
- A. Shoreline structures – e.g. armoring, dikes, jetties, fill, tide gates, overwater structures, and etc.
 - B. Slope/bluff conditions- landslide activity, toe erosion, slope stability, steepness/height
 - C. Upland and aquatic uses – only as they affect nearshore processes
 - D. Beach substrate (Sediment type) (Accretion shoreforms)
 - E. LWD
 - F. Identifying and mapping salmon forage fish stocks and spawn deposition areas.
 - G. Intertidal and subtidal flora and fauna (e.g. Eelgrass beds/Kelp)
 - H. Riparian/upland vegetation - only as they affect nearshore processes

PSAMP Guidelines for shoreline hardening inventories, Simenstad et. al. 1991 (Estuarine Habitat Assessment Protocol, Anchor Environmental nearshore habitat assessment methods, DOE/PSAT - "Recommended Protocols for Measuring Selected Environmental Variables in Puget Sound (1996), WDFW – Forage Fish Spawning and Distribution in San Juan County and Protocols for Sampling Intertidal and Nearshore Regions, DNR's protocols for mapping nearshore eelgrass beds with underwater videography.

- Step 2 - Describe the Salmon utilization of the Estuary and Nearshore areas
- A. Where and When they are present
 - B. What they are eating

- Step 3 - Synthesize Information
- A. Assemble written reports and existing data including, GIS data, maps, inventories, videos, aerials, government records, studies and literature of current nearshore habitat conditions and characteristics.

The "FINAL REPORT – NORTHWEST STRAITS NEARSHORE HABITAT EVALUATION" in sections 2.1 and 2.2 contains good references for sources of existing nearshore information.

- B. Document Historic Habitat Conditions

Historic aerial photographs and other documentation of shoreline condition

- C. Compile information into ESRI and SSHIAP compatible, GIS data and maps.
The SSHIAP program should be consulted to ensure that all data is in compatible formats WDFW/NWIFC – Randy McIntosh)