Report to the Salmon Recovery Funding Board
On
Marine Nearshore Habitat Issues, Efforts and
Funding Options

November 21, 2000

Introduction and Report Structure

The Salmon Recovery Funding Board (SRFB) learned during the Early 2000 grant cycle that marine nearshore habitat protection and restoration projects were not well represented in the projects proposed for funding. To begin to address this issue, SRFB staff convened a Marine Nearshore Habitat Workshop in July 2000 to review marine nearshore issues and funding needs and their relationship to the SRFB funding process. The workshop is summarized in a previous report to the SRFB that includes recommendations for how to address these issues and needs. Because the workshop was attended primarily by Puget Sound area experts, SRFB staff convened a second meeting of coastal experts to gather additional information and input. This report summarizes input from both the workshop and the meeting, as well as one-on-one discussions with many marine nearshore science and policy experts.

Overall, there is a general consensus that:

- Marine nearshore habitats are crucial for salmon recovery;
- Marine nearshore habitats have been and are continuing to be lost and degraded due to a variety of threats;
- There is a significant need and desire for a regional approach that provides technical information, knowledge, and a framework to set priorities for marine nearshore projects and efforts;
- There is also a need and desire to use existing mechanisms at the local level to encourage and stimulate marine nearshore projects and efforts;
- There is an opportunity for the SRFB to better address the need for marine nearshore funding for salmon recovery.

The primary purpose of this report is to provide the SRFB with a range of suggested actions for improving the overall system of salmon recovery funding with respect to marine nearshore habitat.

Definition and Examples of Marine Nearshore Habitat

For the purposes of this report, marine nearshore habitats 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 marine 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.

All of the above marine nearshore habitats exist in Western Washington. In general, areas where marine nearshore habitats are present include the lower Columbia River Estuary; Puget Sound including the Strait of Juan de Fuca; the Northwest Straits region; Grays Harbor; Willapa Bay; and the entire Washington Coast, including many smaller river mouth estuaries and deltas. While these areas can be classified generally as marine nearshore habitats, they represent very diverse habitat types. For example, physical differences between central Puget Sound basin, the Strait of Juan de Fuca, and the Washington Coast are vast. Puget Sound is a large, deep estuary with a long mixing time, in the rainshadow of the Olympic Mountains, containing many smaller river mouth estuaries and embayments. The Washington Coast, on the other hand, is exposed to harsh weather conditions and therefore has much more rugged terrain and habitats in general. The Strait of Juan de Fuca is a linear migratory corridor for many species, and contains a mixture of habitats representing both the more rugged coastal environment and the more protected inner bay environment. While both are considered estuaries, Puget Sound and the Lower Columbia River are also vastly different as well. The Lower Columbia River estuary is wide and shallow, with a very rapid saltwater/freshwater mixing time and tidal exchange. These examples only highlight some of the major differences between Washington's marine nearshore habitats. Within each general area exist many more finely differentiated nearshore habitat types.

Despite the large differences between marine nearshore habitats between the Coast, the Straits, Puget Sound, and the Lower Columbia River, these systems all share some major similarities and are all interconnected from the point of view of salmon and other fish and wildlife. Many of these areas share similar threats that are degrading marine nearshore habitat. Many of the same species inhabit these areas and use the habitats in a similar fashion. And many of these habitats are connected to each other by water flow, or are linked together by other habitats serving as migratory corridors. These similarities and links serve to underscore the importance of viewing these areas a one system, rather than separating them arbitrarily for political reasons.

The Importance of Marine Nearshore Habitat

Washington's nearly 2,300 miles of marine shoreline contain 800,000 acres of nearshore marine habitat. These environments are critically important for hundreds of marine and estuarine plants, fish and wildlife, as well as to the

state's economy and quality of life for its citizens. Marine nearshore areas attract and support the majority of the state's population – nearly three million people live near the shores of the Pacific Ocean, Puget Sound, Hood Canal, and the Northwest Straits.

Many fish and wildlife species depend on marine nearshore habitats for some or all of their life cycles. Marine nearshore species that are both used by and dependent upon salmon, such as forage fish and eagles, require functioning marine nearshore environments. Salmon utilize the entire marine nearshore fringe at various points in their life cycles. They require functional marine nearshore habitat to undergo the transition from fresh to salt water. Salmon require these habitats for rearing and feeding and to support sufficient prey that are dependent on these habitats (such as sand lance, herring, and smelt). They also require shallow water along marine shorelines for migration; adequate water and sediment quality; and natural levels of predation. Chum and Chinook salmon, which were listed for Puget Sound under the ESA, are the most estuarine-dependent of the Pacific salmon species, while coho and sea-run cutthroat trout also forage and rear in a variety of marine nearshore habitats. Decaying salmon carcasses also provide much needed nutrients to many marine nearshore habitats.

Washington's marine nearshore environments stimulate a great deal of interest and research. Last year, over 2,000 people attended marine nearshore habitat workshops held around western Washington. This interest and research is focused on understanding the functions and processes of these environments, as well as determining the primary threats to these areas and possible solutions for restoring and protecting them.

Problems and Threats Facing Marine Nearshore Habitat

In general, compared with historical Washington conditions, there is very little intact marine nearshore habitat remaining. Alteration through dredging, filling, diking, straightening, and armoring have been the major factors eliminating or degrading marine nearshore habitats. Dams throughout Washington's river systems have had a major impact on the amount and timing of water reaching the marine nearshore, as well as sediment impacts. Historical and current contamination of nearshore sediments from industrial waste disposal and stormwater runoff has also contributed to losses in nearshore habitat function. More recent threats to the nearshore are well known and documented, and include continued shoreline alteration such as paving of roads and parking lots; construction of jetties and bulkheads; over-water structures such as docks and piers; and the removal of nearshore vegetation.

Natural erosion and sedimentation processes provide critical spawning substrate for salmon and many other species. Alteration of bluffs that have historically

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provided substrate to nearby beaches and sand bars has resulted in loss of important marine nearshore habitat. Shoreline armoring in particular, such as bulkheads and other shoreline structures, can have a dramatic effect on these processes, accelerating erosion of beaches by altering sediment flow patterns and preventing beach renourishment. This causes a sediment deficit on shorelines that destroys production of intertidal spawning and rearing habitat.

Introduction of exotic species, such as Spartina, has had a negative impact on nearshore marine habitats, excluding many native species from their preferred habitat and impacting predator-prey relationships. Tidegates, when not functioning properly, can significantly impact marine nearshore habitat integrity. And harvest of or threat to forage fish and other prey items for salmon can have a detrimental impact on salmon.

Most of the threats described above have a direct negative impact on endangered and threatened salmon. For example, over-water structures can harbor predators of salmon, such as seals. Tide-gates can prohibit salmon passage upstream from nearshore habitats. Channel modification and armoring can remove critical salmon spawning and rearing habitat. And derelict fishing gear such as ghost nets can tangle and possibly kill migrating salmon (and other fish and wildlife) in the marine nearshore.

These threats are only a cursory list – many credible scientific papers document the wide array of threats causing marine nearshore habitat loss and degradation. A selected bibliography of some of the more recent or best known marine nearshore research is provided at the end of this report.

Considerations For Marine Nearshore Project Success

As with freshwater systems, habitat protection (through acquisition and conservation easements) combined with restoration are primary tools for improving marine nearshore habitat availability and quality for salmon and other species. However, restoration actions in the marine nearshore are not always the same as they would be for upland riparian and instream restoration. When deciding on priorities for marine nearshore habitat protection and restoration, it is important to consider the type of habitat, the location, the amount of habitat, and the timing for the project to be successful. Factors to be considered in habitat protection and restoration for salmon recovery include:

- Inputs to habitat such as light, wave energy, water, nutrients, and sediments, and
- How these inputs affect outputs for salmon such as production and consumption of food, migratory paths and connectivity, water quantity and quality, and refuge from predation.

Size of the marine nearshore acquisition or restoration project site may also be a factor in determining long-term effectiveness and success. For restoration projects in particular, "habitat size, shape, accessibility, connectance, and self-maintenance are critical concepts for restoration to historic condition, enhancement of selected attributes, and creation of a new ecosystem." (Shreffler and Thom 1993). Shreffler and Thom go on to say that in the marine nearshore, "restoration should create a system that is relatively stable, persistent, and resilient," and that "larger, well-established habitats tend to have these characteristics." However, other marine nearshore scientists point to the value of protecting and restoring smaller estuarine and marine nearshore areas (such as the river mouth estuaries of the Hoh, Quileute, Queets, and Pysht Rivers along Washington's coast). These areas are smaller than other river deltas, and are in some cases severely altered. However, their value as salmon habitat may be greater than some of the larger estuaries, and should receive appropriate funding attention.

Success of marine nearshore restoration is variable depending on the type of project, the timing, location, and other influences on the site. Predicting the performance of marine nearshore habitat restoration is difficult in part because follow-up monitoring and analysis is often not conducted for many projects. This illustrates the need for including monitoring in the design of all such projects. With adequate follow-up monitoring, analysis, use of adaptive management principles, and dissemination of results, prediction of success may be easier in the future. Factors inhibiting success of marine nearshore habitat restoration (as well as freshwater restoration) include:

- The absence of a strong regulatory and enforcement regime;
- Unrealistic project goals;
- Insufficient project design and planning;
- Selection of the wrong sites, or poor site preparation;
- Lack of preparation for contingencies, or lack of follow-through;
- Lack of monitoring and documentation;
- Inadequate consideration of project sustainability over time;
- Poor dissemination of results.

When funding marine nearshore projects, it will be important to address these factors and to encourage sufficient project planning and design to ensure project success.

Nearshore restoration projects should take into account land ownership, priority salmon stocks, drift-cells and sediment budgets, and habitat connectivity, to name a few parameters important for prioritization. Restoration priority could also focus on reducing or eliminating harmful influences first, and then performing restoration activities at the site once harmful influences are eliminated. Some suggest performing protection and restoration activities at the

same site for the greatest success and benefit to salmon. Others advocate selecting projects that are easiest to accomplish or achieve the quickest results.

Limiting Factors Analyses (LFA's) often don't include marine nearshore habitat issues, but there's nothing precluding LFA's from dealing with marine nearshore habitat in that specific watershed. The marine nearshore is very important for salmon recovery; an ecosystem analysis for summer chum would show the marine nearshore environment is critical for recovery of this species. The LFA's need to be comprehensive and include the marine nearshore because of its importance to the salmon life cycle. Battelle is doing a "State of the Nearshore" report for King County, and indicate there are a lot of gaps in the available nearshore habitat data related to salmon habitat. If a watershed does not have an assessment, it is difficult to know if a project is a true priority for salmon recovery. Some believe that the SRFB should broaden its definition of assessments so that marine nearshore assessments can be considered for funding (note: these types of assessments are eligible for SRFB funding as long as they lead to project identification and prioritization for an area).

The salmon life cycle is very important for recovery purposes – this needs to be factored into assessments and Limiting Factors Analyses. Watershed assessments need to be holistic – to take into account the connection between the upper and lower watershed and marine nearshore areas in terms of salmon life cycle. In some cases, upstream projects such as barrier removal should be taken into account when marine nearshore habitat projects are evaluated, in order to ensure successful salmon recovery in the watershed. For example, a fish passage barrier at the top of a watershed may not necessarily need to be removed for a marine nearshore project to be effective. However, a barrier closer to a river mouth estuary may need to be removed before additional marine nearshore habitat restoration is considered.

Concerns About the Current Research, Protection, Restoration, & Funding System

In general, the current salmon recovery funding process in Washington does not encourage marine nearshore habitat projects. Many believe that the primary reason for this is that many lead entities have expertise in and are focused on the freshwater portion of the watersheds. Many lead entities do not have in-depth knowledge about marine nearshore habitat science and ecology, and therefore do not have the tools to identify and select marine nearshore habitat projects in concert with freshwater projects. In addition, in past SRFB grant funding cycles, project application forms and evaluation teams were inadvertently biased toward freshwater projects because of terminology used and types of information requested. Because scientific information about marine nearshore and estuarine habitats is often not included in the Lead Entity process, lead entities tend to address only freshwater salmon recovery problems.

About three quarters of the marine nearshore habitat projects that are being proposed to the SRFB for the Second Round 2000 grant cycle are assessments. Because SRFB criteria for funding indicate that projects should be supported by assessments, this can inhibit good marine nearshore habitat protection and restoration projects proposals to the SRFB. Some experts suggested that the SRFB consider encouraging lead entities and project sponsors to proceed with and encourage marine nearshore projects without necessarily waiting for new assessments to be completed. Some believe that additional marine nearshore habitat assessments are not necessarily justified - there is actually quite a bit known about what needs to be done in the marine nearshore, but the people who have this information need to be included and involved in the project identification and prioritization process.

Specific and General Solutions

Participants in the SRFB marine nearshore workshop and coastal meeting suggested the following solutions. These are suggestions only, and do not reflect a staff recommendation:

Within the SRFB Sphere of Influence:

- Encourage all watershed assessments to consider the importance of the marine nearshore;
- Encourage lead entities to incorporate marine nearshore technical expertise into their process;
- Develop a directory of marine nearshore technical experts, reports, etc. for use by lead entities and others;
- Continue to monitor and analyze the lead entity and SRFB process for bias against funding marine nearshore habitat projects;
- Develop SRFB processes that ensure marine nearshore projects come forward and are appropriately funded;
- Create incentives and a process for prioritizing marine nearshore habitat projects at both statewide and local levels. This effort should utilize the expertise of the marine nearshore science and policy community;
- Employ specific criteria for soliciting marine nearshore projects as well as selecting projects for funding.
- Consider possible SRFB funding of marine nearshore habitat assessments and research; monitoring; and information sharing. Nearshore assessments and characterizations of current nearshore conditions in particular are needed to determine baseline conditions and the level of threats to these habitats. This information will lead to better project design, prioritization, and implementation;
- Consider funding protection projects that either acquire fee or less than fee interests in key marine nearshore properties;

- Consider funding Protected Areas Management for areas where land is acquired;
- Consider encouraging acquisition to be used as a tool only in cases where there is a regulatory taking;
- Create an incentive for cross-WRIA nearshore projects (consider extra points in scoring?);
- Make the SRFB application forms and questions more marine nearshore-project friendly; Add a question about how lead entities factored nearshore projects into their process;
- Provide financial support to a regional marine nearshore technical workgroup to develop a framework for marine nearshore project prioritization;
- Utilize Marine Resource Committees in prioritizing marine nearshore projects at the local/regional levels;
- Make sure project sponsors coordinate with Washington Department of Natural Resource (DNR) on state-owned aquatic lands;
- Send a strong message from SRFB that the Shoreline Management Act should be supported, implemented, enforced;
- SRFB should be clear about its expectations regarding assessments, and what it expects assessments to do;
- Need consistency in SRFB technical review of marine nearshore projects;
- Need to develop methods for technically reviewing marine nearshore projects for project quality (i.e., criteria);
- SRFB needs to be strategic about which marine nearshore projects it will support. Give guidance on types of eligible projects;
- SRFB funding should be set aside for marine nearshore projects in the following categories:
  - Marine nearshore research that has broad implications;
  - Marine nearshore demonstration projects;
  - Projects that provide technical expertise to others;
- Develop and require some common protocols for marine nearshore project monitoring of each SRFB-funded project;
- Have a marine nearshore representative on the SRFB review team;
- SRFB should allow acquisition projects, but should be cautious about funding them. Acquisition projects should be tied to actual marine nearshore habitat loss.
- If you want input from the coastal estuary folks, hold your meetings in those locations.
- SRFB technical evaluation team should have estuarine and marine habitat expertise represented.

- Consider funding a nearshore habitat limiting factors analysis…..to show what the primary threats are, what the priority actions or solutions should be to address these threats. Use existing data as a baseline.
- Include in the application instructions a description or discussion of the continuum of projects along the range of salmon habitat – and ask applicants to identify where their project falls along the continuum (marine, estuarine, freshwater).
- Consider having funding/evaluation criteria that encourage and promote linkages between complementary projects (eg. an up-river barrier removal project and a marine nearshore habitat restoration project for the same stream). Restoration strategies across a watershed need to be balanced and integrated (eg. LWD with plantings).
- Ask applicant to describe expected net benefit of their project, and have a monitoring plan for determining success (such as smolt trapping or spawner counts).
- Recognize that project monitoring protocols might be different for different projects.
- Determine levels of funding to support restoration in urban as well as rural locations.

Other suggestions (some outside scope of SRFB):

- Fill data gaps for marine nearshore habitat with respect to salmon
- Conduct comprehensive assessments of entire nearshore or estuarine areas to determine priority areas and habitat types for protection and restoration
- Develop salmon life history models that can include the nearshore and estuarine habitat and allow assessing the relative importance of these habitat types compared to fresh water salmon life history stages
- Information is needed about the specific historic function of each type of marine nearshore habitat, and a characterization of current conditions throughout Washington's nearshore. This information would be helpful in determining restoration and protection priorities for salmon recovery;
- A marine nearshore habitat prioritization/selection scheme is needed at both the regional and local levels. This process or framework should draw upon scientific information and guidance, as well as economic and political realities. Many existing efforts are already utilizing processes or frameworks that can be replicated or consolidated. For example the Northwest Straits Commission, Marine Resource Committees, People for Puget Sound, and WDFW are all engaged in efforts to prioritize marine nearshore habitat protection and restoration.
- Support of existing regulations (such as the Shoreline Management Act and local permitting laws) and strengthening enforcement will be critical to nearshore protection and related salmon recovery;

Existing Programs, Efforts and Models

There are many existing marine nearshore habitat research, protection, and restoration efforts in Western Washington being implemented by federal, tribal, state, and local governments, non-profit groups, and the private sector. These efforts span everything from small site-specific studies, assessments, and data collection projects to large-scale, regional programs. Some of the major marine nearshore efforts are described in Appendix C of this report. These do not represent all programs and efforts, but rather a sample. SRFB staff will continue to add to this list as additional information becomes available. In pursuing any change in the current process for salmon recovery funding, it will be important to understand the range of existing, ongoing marine nearshore efforts and seek to coordinate with and integrate salmon recovery funding with these efforts.

Funding Process Actions

According to the input of a wide variety of marine nearshore habitat experts and salmon recovery partners, there is a significant need for a regional approach that provides technical information, knowledge, and a framework to:

- Set priorities for nearshore projects (taking into account local nearshore/marine efforts such as the Marine Resource Committees);

- Use existing mechanisms at the local level to encourage and stimulate nearshore projects;

- Keep track of proposed and funded nearshore marine projects, and ensure that the funding of these projects continues to be reflective of the nearshore's importance for salmon recovery.

Some actions that have been proposed are not within the legal authority of the SRFB. For example, a few people recommended that marine nearshore habitat project proponents bring their projects forward directly to the SRFB, to be evaluated either along with lead entity project lists, or in a separate evaluation and funding process. This action would violate existing salmon recovery legislation that requires lead entities to assess, identify, and prioritize salmon recovery projects and propose them to the SRFB for funding consideration.

Below, several possible funding processes suggested by workshop and meeting participants are presented and analyzed. These actions are offered as ways to better address marine nearshore habitat funding for salmon recovery. They are drawn from input from marine nearshore habitat science and policy experts in Washington (listed in Appendix A of this report). These actions are not mutually exclusive, but rather represent a tool box from which to select those tools that would be most useful and effective.

Lead Entity Approach: Rely on the existing Lead Entity structure and process to bring the best projects forward, including marine nearshore projects. This model assumes some future improvement in SRFB criteria, policies, and incentives to encourage existing LE's to consider and rank marine nearshore projects appropriately. Some Lead Entities, such as the Hood Canal Coordinating Council, are already doing a good job of identifying and prioritizing marine nearshore projects and can serve as a model to other Lead Entities. Within this option, a decision could be made to require all Lead Entities for watersheds that have marine nearshore environments to automatically rank these environments (and associated projects) as high priority.

Some suggest that a way to improve lead entity attention to the marine nearshore is for the SRFB to subcontract with Marine Resource Committees to provide nearshore technical expertise to lead entities, and have lead entities propose nearshore projects to the SRFB.

Advantages:

- Fairly cost effective - changes needed would be to SRFB criteria, policies and incentives to encourage and fund marine nearshore projects;
- Relies on an existing structure, and doesn't create another group or process;
- Allows LE's to take charge of their own areas – gives them autonomy to decide relative importance of marine nearshore areas and projects;
- Does not require extra assessments and research, and added time, to move forward. Would only require Lead Entities to include the appropriate experts and information in their ranking process;

Disadvantages:

- Does not encourage cross-WRIA, multi-Lead Entity efforts for assessments, studies, projects (unless this is built into SRFB incentives and criteria somehow);
- Does not automatically result in the use of existing marine nearshore knowledge and technical resources that are available;
- Most LE processes and WRIA assessments are based on upland freshwater habitat needs. This model does not change that fact;
- Some lead entities may not promote nearshore projects, even if they receive technical guidance and incentives from experts like the MRC's

Marine Nearshore Lead Entity: One or more new marine Nearshore Lead Entities would conduct marine nearshore habitat assessments and project prioritization for Puget Sound and the Washington Coast (including the lower Columbia River estuary, the western Strait of Juan de Fuca, and the coastal estuaries). The new Lead Entities would propose marine nearshore habitat projects and efforts directly to SRFB for funding consideration. The Marine

Nearshore Lead Entity would rely on existing scientific information, technical experts, local expertise (such as MRC's and local studies); and projects/efforts already underway. The Marine Nearshore Lead Entity project list could be considered for funding along with other LE projects, or in a separate process with separate funding specifically for marine nearshore projects. The SRFB may need to provide administrative and/or assessment funds to the new Lead Entity to enable its success.

Advantages:
- This option fits well with the existing Lead Entity process established by the Legislature
- The transition to funding an appropriate level of marine nearshore projects would be immediate, and other Lead Entities would not have to face a steep learning curve to prioritize marine nearshore projects on their lists. This would save both time and resources in prioritizing marine nearshore projects for the SRFB
- Marine nearshore experts would guide project prioritization at statewide, regional, and local levels

Disadvantages:
- This option does not encourage existing Lead Entities to consider the connections between freshwater and marine systems when prioritizing projects. No investment is made in existing Lead Entities for building their knowledge about marine nearshore issues and efforts
- This option forces a disconnection between the freshwater and marine systems that may not best serve ecosystem-based salmon recovery;
- It is unclear who would staff this new Lead Entity, and whether funding would be necessary to run it

Regional Technical Panel/MRC Model: A Regional technical group and Marine Resource Committees (MRC's) take the lead in prioritizing marine nearshore projects, areas, and efforts, and feed these through existing Lead Entities. These projects would then compete with other projects on the LE lists in the LE ranking process.

In this option, the technical group would rely on the existing tools and efforts described above, as well as their knowledge and expertise. The group may require that additional studies and assessments be conducted to identify priority projects and geographic areas where such information does not yet exist. The SRFB would need to decide whether to provide some dedicated funding for these studies, or to staff the Regional technical group or to support MRC's in this effort. The SRFB would need to improve criteria, manuals, and technical assistance to Lead Entities to encourage and enable them to bring marine nearshore projects forward. Some also suggest that this option should include incentives or requirements for all marine counties to form MRC's.

Advantages:
- Project prioritization for marine nearshore projects is done with regional as well as local needs in mind
- The state's regional and local marine nearshore experts help guide marine nearshore project prioritization ensuring that the best projects are presented to the SRFB
- Lead Entities benefit from the knowledge and expertise of marine nearshore experts. This is an investment in the current Lead Entity process and will allow Lead Entities to learn and develop expertise over time with respect to marine nearshore issues
- This option benefits from the work already done by others to assess the marine nearshore and identify and prioritize projects

Disadvantages:
- This option adds another layer of coordination and input to the project prioritization process, which will likely result in the project prioritization process taking more time and resources
- It may be difficult to get long term expert participation on a state marine nearshore technical group to guide all Lead Entities, since this would be a major undertaking with large time commitments and undetermined funding (for salaries, stipends, travel, etc.)

APPENDIX A
SRFB Marine Nearshore Workshop and Meeting Participants
And Experts Providing Guidance for this Report

*Anne Shaffer, Washington Dept. of Fish & Wildlife (WDFW)
Bill Gardner, Lower Elwha Klallam Tribe
Bill Graeber, Washington Dept. of Natural Resources (DNR)
*Brian Allee, Columbia Basin Fish & Wildlife Authority (CBFAW)
Bruce Sutherland, Lower Columbia River Estuary Program (LCREP)
Cathy Lear, Clallam County
Carole Richmond, House Natural Resources Committee
Chad Stussy, WDFW
Christy McDonough, Columbia River Estuary Study Task Force (CREST)
Cynde Donaghue, Washington Dept. of Ecology
Dan Pentilla, WDFW
Dana Woodruff, Battelle Marine Sciences Laboratory
David Masters, King County Dept. of Natural Resources
Don Haring, Conservation Commission
Ed Manary, Conservation Commission
Gary Wilburn, Senate Democratic Caucus
Gary Wood, Island County Marine Resources Committee
Ginna Correa, WDFW
Greg Williams, Battelle Marine Sciences Lab
Hedia Adelsman, Governor's Salmon Recovery Office
Hugh Shipman, Coastal Geologist, Washington Dept. of Ecology
Jacques White, People for Puget Sound
• Janet Kearsley, Island County Public Works
• Jay Watson, Hood Canal Coordinating Council
Jeff Cederholm, WDFW
Jim Brennan, King County DNR
Jim Fox, Salmon Recovery Funding Board (SRFB)
Jim Kramer, SRFB
Joe Schmitt, Clallam Marine Resources Committee (MRC)
John Boettner, DNR
• John Cambalik, North Olympic Peninsula Lead Entity Group
John Dohrmann, Puget Sound Action Team
John Schmitt, Clallam MRC
John Stadler, National Marine Fisheries Service
Kitty Weisman, SRFB
Kurt Fresh, WDFW
Kyle Murphy, Washington Dept. of Agriculture
Larry Moulton, MJM Research, Lopez Island
Laura Eckert Johnson, SRFB
Leslie Ryan, DNR Aquatic Lands Enhancement Account (ALEA) Grant Program
Linda Maxson, UW Sea Grant
Lynn Palensky, SRFB

Marc Duboiski, SRFB
Mike Ramsey, SRFB
Paul Lumley, Columbia River Inter-Tribal Fish Commission (CRITFC)
Phil Trask, WDFW
Randy Johnson, WDFW
Robert Warren, Sea Resources
• Ron Craig, Willapa Fisheries Enhancement Group & Pacific County Lead Entity
Ron Thom, Battelle Marine Sciences Laboratory
• Sego Jackson, Snohomish County
Steve Keller, WDFW
Ted Schmidt, Lower Elwha Klallam Tribe
Terry Stevens, Padilla Bay National Estuarine Research Reserve
Tom Cowan, Northwest Straits Commission
Tom Mumford, DNR
• Will Hall, Snohomish County

• Lead Entity Representative
* SRFB Technical Panel Members

APPENDIX B
Selected Bibliography
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APPENDIX C

A Sampling of
Existing Marine Nearshore Programs, Efforts, and Initiatives

Western Washington's extensive and diverse marine nearshore environments inspire many regional-scale and local-scale efforts to assess and research, as well as preserve and restore these environments. These efforts vary in geographic scope, participation, and substantive focus – they represent initiatives sponsored by a wide range of federal, state, tribal, local and non-profit organizations addressing a variety of marine nearshore habitat issues and concerns. All of these efforts, described briefly below, can serve as guidance for the SRFB and statewide salmon recovery in general. While this list includes many of the important marine nearshore habitat efforts active today, it is not a comprehensive list of all past and present marine nearshore initiatives. The SRFB should seek to understand and to the extent practicable, coordinate with these efforts described below to maximize and not duplicate efforts. Efforts and modeling tools that assess and research the marine nearshore environment are described below, followed by brief descriptions of efforts that identify, prioritize, and implement marine nearshore habitat protection and restoration activities.

Modeling & Assessment Tools

SSHIAP:

The Salmon and Steelhead Inventory and Assessment Program (SSHIAP) is a partnership-based information system led by WDFW and the Northwest Indian Fisheries Commission that characterizes freshwater and estuary habitat conditions and distribution of salmonid stocks in Washington. Data and information for SSHIAP is stored within a Microsoft ACCESS® database that quantitatively characterizes habitat conditions, incorporates Salmonid Stock Inventory (SaSI) data on stock distribution and status, and links habitat conditions and stock distribution with productivity modeling efforts. SSHIAP currently covers Water Resource Inventory Areas (WRIA's) 1-23; work is partially funded and underway to extend SSHIAP coverage to WRIA's 24-62. Work is also underway to link SSHIAP data to a Geographic Information System (GIS) that will enable spatial data querying and analysis. Through a SRFB grant, WDFW is seeking to incorporate estuarine properly functioning conditions data and information into the SSHIAP system as well.

SSHIAP is designed to support regulatory, conservation, and analysis efforts such as Washington State Watershed Analysis, State Salmon Recovery, Habitat Conservation Planning, Ecosystem Diagnosis and Treatment (EDT), and others. There are four parts to the approach: (1) delineation of watersheds into discrete

stream segments, (2) identification of current and potential fish distribution by SaSI stock, (3) quantification of obstructed and degraded habitat, and (4) quantification of historical habitat.

EDT:

The EDT method was developed by Mobrand Biometrics, a Washington-based consulting firm. This method or tool provides a practical, science-based approach for developing and implementing watershed plans. The method enables comparison between existing and desired habitat conditions in a watershed for a *diagnostic species*, such as wild salmon, in order to determine which factors or functions that are preventing the diagnostic species from flourishing. EDT can also be used as a predictive tool to determine what will happen to wild salmon if certain habitat conditions are altered. Although EDT was developed for watershed-based use, information and data for marine nearshore and estuarine areas can be used in the model to compare existing habitat conditions to a preferred state. Biologists at WDFW, DNR, and others are working cooperatively under the SSHIAP program to develop estuarine and marine nearshore *properly functioning conditions* that can be used in EDT modeling to determine whether current habitat conditions are lacking in their ability to support wild salmon.

Restoration of Urban Estuaries

Often, the location of habitat restoration and protection activities is based primarily on the availability of potential work sites. However, the fundamental flaw with this approach is that those sites that are available may not result in the most ecologically sound restoration and protection. Recognizing this fact, Washington Dept. of Natural Resources contracted with Battelle Marine Sciences Laboratory to evaluate alternative approaches for site location and design of urban estuary habitat restoration in Puget Sound. DNR's interest in this issue stems from its ownership of most of Washington's marine and estuarine bedlands, and its role in Natural Resource Damage Assessment and restoration planning in urban estuaries around Puget Sound required by federal and state law.   Battelle's study determined that restoration to historic (not predisturbance) conditions has a high probability of success if carefully planned, designed, and implemented. They found that this is perhaps the best overall approach for restoration in degraded urban estuaries, if adequate historical data about the historical habitat conditions is available. Battelle found that sites with the best success for restoration to historical conditions in urban estuaries are those sites that are large (greater than 20 acres); are able to be restored to historic conditions; are self-maintaining; are connected to a natural wetland or river system; and have minimal adjacent disturbances. They also found that small habitats such as fringing wetlands may provide important corridors for species such as salmon. The findings of this study can be (and are being) used to

identify and prioritize habitat restoration activities in urban estuaries such as the Puyallup Delta in Commencement Bay.

Estuarine Habitat Assessment Protocol:
The protocol, developed in 1991, is an *ad hoc* approach to assessing estuarine habitat function for fish and wildlife using quantitative parameters. The protocol was developed using the accumulated knowledge of estuarine scientists and managers in the Puget Sound region, under the auspices of the Puget Sound Estuary Program, which recognized the need for procedures to quantitatively assess the function of estuarine wetlands and associated nearshore habitats for fish and wildlife. The focus of the protocol is narrow, limited to estuarine habitats and only their functions that support fish and wildlife. The protocol was designed, however, to be updateable with new information and parameters if needed and available. The protocol is based on the premise that any reliable assessment methodology must measure characteristics (or attributes) of estuarine habitats that promote fish and wildlife utilization and fitness. The protocol is designed to collect and analyze this information specifically to develop more successful approaches to habitat restoration in estuarine environments.

DNR's Nearshore Habitat Program
Washington Dept. of Natural Resources has a strong interest in protecting and managing Washington's aquatic environments – the agency owns and manages about 93% of Washington's total aquatic land area, including marine nearshore habitats. As a result, DNR sponsors a number of programs and initiatives to study and manage marine nearshore habitats. Of these programs, DNR's Nearshore Habitat Program, provides some very valuable tools for salmon recovery planning. The purpose of DNR's Nearshore Habitat Program is to provide information on status and trends in nearshore habitat through research, monitoring, and information dissemination. Specifically, the Nearshore Habitat Program inventories the abundance and distribution of marine and estuarine habitats, and monitors how habitat quantity and quality are changing over time. This information is made available to DNR's aquatic resource managers, the Puget Sound Ambient Monitoring Program, the Puget Sound/Georgia Basin Task Force, Washington Dept. of Fish & Wildlife Priority Habitat and Oil Spill Programs, and other state and local agencies. The purpose of DNR's Nearshore Habitat Program is to improve marine nearshore resource management by quantifying the abundance and distribution of these habitats, identifying environmental trends, and advancing overall understanding of the marine nearshore ecosystem. The Nearshore Habitat Program produces and disseminates some of the most up-to-date and accurate data (including GIS data) and information about Washington's marine nearshore environment. DNR also manages the Aquatic Lands Enhancement Account (ALEA) grant program, a statewide water access and habitat protection/restoration grant program.

Some Key Programs and Efforts that Identify & Prioritize Marine Nearshore Projects

People for Puget Sound & Skagit Watershed Council – Skagit Estuary Restoration Assessment

Recently, People For Puget Sound (a non-profit environmental group) partnered with the Skagit Watershed Council, Pacific Coast Joint Venture, and the US Fish & Wildlife Service to determine the extent of nearshore habitat loss in the Skagit River estuary, and to identify and prioritize areas that would be appropriate for restoration. The study uses information about historic conditions of the estuary and nearshore habitat loss, seasonal flooding, hydrologic connectivity, tidal flooding, ecological sustainability, and ease of restoration (including public land occurrence, land cover, and parcel density to rank priority areas in the estuary for habitat restoration. Because the study is based on ecological characteristics and criteria, the outcome does not represent a restoration plan but rather an initial step to developing a restoration plan. Future planning for restoration and protection in the Skagit Estuary would have to also incorporate social, cultural, and economic values and factors to arrive at a realistic set of restoration and protection priority areas. This effort is based on strong cooperation and partnerships and good scientific information, and represents a practical and simple approach for developing a road map for nearshore habitat restoration. The study methods can be applied to other river deltas throughout the Puget Sound basin.

State of Washington Natural Area Preserves and Natural Heritage Program

In 1972, the Washington State legislature passed the Natural Area Preserves Act (RCW 79.70). The purpose of this act was to "...secure for the people of present and future generations the benefit of an enduring resource of natural areas by establishing a system of natural area preserves, and to provide for the protection of these natural areas."

In 1981, the legislature established the Natural Heritage Program within the Department of Natural Resources to assist with the identification of potential areas to include within the natural areas system. The Natural Heritage Program's mandate is to 1) develop a classification of natural heritage resources, 2) maintain an inventory of the locations of these resources, 3) maintain a database for such information, and 4) provide assistance in the selection and nomination of areas containing natural heritage resources for potential natural area designation. The Natural Heritage Program includes a marine/estuarine component, and several Natural Area Preserves include critical marine nearshore habitats. Natural Heritage Program geographic information and data are maintained within the department's Geographic Information System.

The State of Washington Natural Heritage Plan established criteria for determining priorities for nominating and selecting natural areas, emphasizing protection of rare species and high quality, representative ecosystems. The DNR cooperates with other state and federal agencies, private organizations, and individuals to implement the plan. One of the primary methods of protection recognized by the *State of Washington Natural Heritage Plan* is acquisition and designation of land as Natural Area Preserves. Various sources of funding are used to acquire Natural Area Preserves, including the Washington Wildlife and Recreation Program and Trust Land Transfer.

Priority Habitats and Species Program (PHS)

The WDFW manages the Priority Habitats and Species (PHS) Program to protect and conserve areas having a unique or significant value to a diverse group of species. Three questions addressed by the PHS program are: 1) Which species and habitat types are priorities for conservation?; 2) Where are these species and habitats located?; and 3) What should be done to protect these resources when land use decisions are made?

Under the PHS Program, WDFW identifies "priority habitats and species," develops management recommendations for each priority species and habitat, and utilizes Geographic Information Systems (GIS) to store and analyze data about habitats and species. Priority habitats may consist of a unique vegetation type or dominant plant species, a described successional stage, or a specific structural element. Most priority habitats are of limited range, are vulnerable to alteration, support unique species, or support species that are dependent on that habitat for their survival. Priority habitats may support comparatively high fish and wildlife diversity and densities, and/or are important breeding areas, seasonal ranges, or movement corridors.

The Priority Habitats and Species Program list contains all State Endangered, Threatened, and Candidate species plus additional species of fish and wildlife that comprise vulnerable aggregations, or have recreational, commercial, or tribal importance. The PHS program has 116 vertebrate, and 29 invertebrate species currently listed. The PHS list and management recommendations are voluntarily used by federal, state, tribal and local governmental and non-governmental organizations for natural resource planning and decision-making.

Northwest Straits Commission, Marine Resource Committees

In 1998, the US Congress authorized the Northwest Straits Marine Conservation Initiative in response to broad community recognition that the marine resources and ecosystems of Northern Puget Sound face many stressors and threats. This program blends well-founded science with grassroots consensus building through seven Marine Resources Committees (MRC's). Marine Resource Committees (MRC) are local committees established by county legislative authority and authorized by Federal statute to provide input and guidance to the

Northwest Straits Commission, the governing body of the Initiative. MRC's actively implement marine resource projects. There are seven MRC's, one for each county in the Northwest Straits region: Clallam, Jefferson, Island, San Juan, Skagit, Snohomish, and Whatcom Counties.

Each of the MRC's is citizen-based, with representatives from local government, tribes, and the scientific, economic, recreational, and conservation communities. The 13-member Commission, consisting of seven MRC representatives and appointees of the Governor and Secretary of the Interior, guides and supports the work of the MRC's. The work of the Commission and the MRC's is guided by a series of performance benchmarks that will measure success of the program over time. Included in the benchmarks are such measures as: a net gain in high-value habitat and ecosystem functions; and establishment of a scientifically-based regional system of marine protected areas.

MRC's provide a good model for how to strategically identify and select activities and projects for marine nearshore habitat protection and restoration in a specific geographic location or region. Over 100 volunteer MRC members in seven counties of Northern Puget Sound are now actively working to restore nearshore, intertidal, and estuarine habitats and support salmon recovery among other activities. Each MRC received a $10,000 start-up grant to organize, provide training for members, assemble relevant data, and develop a workplan. Most MRC's also received up to $25,000 in grants for specific projects that included an eelgrass survey in Island County, educational workshops, monitoring bottomfish in San Juan County, and a Whatcom County shoreline inventory.

King County's Central Puget Sound Watershed Forum
A consortium of cities within King County and in unincorporated King County makes up the membership of the Central Puget Sound Watershed Forum. The Forum has identified estuary and marine nearshore habitat restoration as its highest resource management priority given the listing of Puget Sound Chinook as threatened under the federal Endangered Species Act. As a baseline for the work of the Forum, King County is inventorying marine nearshore habitats and analyzing the factors contributing to their degradation. This assessment will be used to identify specific sites in the marine nearshore for acquisition and restoration, with the goal of increased salmon productivity and wildlife utilization. This assessment will take a couple of years to complete, however the Forum does not want to wait to implement marine nearshore habitat restoration and protection efforts.

To meet its responsibilities under the ESA, the Forum has decided to move forward to identify and implement salmon recovery projects (particularly in the marine nearshore environment) using existing information and data, and local expertise. The Forum convened a Marine Science Expert Panel to develop a list of specific marine nearshore projects for early action based on ecological and

technical considerations and to create ecological criteria for use in evaluating future proposed early action projects. This work of the Panel would result in what the Forum calls "no regrets" projects. The Forum and the Panel recognized that the "no regrets" early action projects may not necessarily be the highest priority projects according to the scientific assessment, but these projects would have a sufficient likelihood of success in meeting the goals of rapid marine nearshore habitat protection and restoration for salmon recovery. Much of the work of the Panel is based on input from the King County Nearshore Technical Committee, an ongoing effort that includes marine nearshore experts from federal, state, tribal, and local governments and the private sector. The Committee was established in January of 2000, and represents a model for local governments and lead entities to use to discuss, analyze, and prioritize marine nearshore efforts.

The Panel screened proposed projects based on a variety of criteria that measured the importance of the project and whether it was a true "no regrets" action. Criteria included the availability of the property; whether the project addressed an appropriate scale for the proposed outcome; whether it had a high probability of success; and whether the project would need long term maintenance to be successful. The Panel considered many other criteria as well. The outcome of this process was an identification of sites, and specific projects at those sites for immediate marine nearshore habitat protection and restoration. This effort serves as a model for how to move forward with marine nearshore project identification and implementation in the absence of a formal scientific assessment.

Hood Canal Coordinating Council Lead Entity – Salmon Recovery Strategy
The Hood Canal Coordinating Council (HCC) is the Lead Entity for the Hood Canal and Eastern Strait of Juan de Fuca watersheds. As such, the HCC recently released its Salmon Recovery Strategy for the watersheds, which focuses on setting priorities for habitat restoration and protection projects. The HCC developed the strategy with its members and partners. The strategy is unique in that it ranks all estuaries as having the highest geographic priority for salmon recovery in the watersheds. The strategy states that "estuaries and marine shoreline environments are important to all anadromous fish. They are used by numerous stocks regardless of their watershed of origin and are listed as a high priority in this strategy . . . Unfortunately, we currently lack the information to prioritize specific geographic shoreline segments with any scientific certainty. Until we have sufficient information, this strategy takes a conservative approach and lists all estuaries and marine shoreline segments in the highest level (Tier 1) of our geographic prioritization." This strategy enables the identification and high prioritization of estuarine and marine nearshore salmon recovery projects **within** the lead entity process for seeking funding, and does not rely upon outside expertise or additional assessments. The HCC also recognizes that as new information becomes available, it will be necessary to change the strategy

accordingly. But for now, by taking a "conservative approach," the HCC is recognizing that there is not enough time to study the marine nearshore for project identification, ranking, and funding purposes. This approach can serve as a model for other lead entities.

Puget Sound Water Quality Action Team & Puget Sound Plan

The Puget Sound Water Quality Action Team, a sub-agency of the Governor's Office, brings together the heads of ten state agencies, a city and a county representative, a representative of federally recognized tribes and ex-officio non-voting representatives of three federal agencies to lead and coordinate efforts to protect Puget Sound. The12-member Puget Sound Council advises the Action Team and recommends ways to make protection efforts viable for local governments and to improve the accessibility of state and federal services to cities, counties and tribes. A governor-appointed chair guides the work of the Action Team and Council, helps develop the work plan and oversees how the work plan is carried out. Under Chapter 90.71 RCW, Action Team members are responsible for: Developing a biennial work plan and budget, coordinating the monitoring and research programs, periodically amending the Puget Sound Water Quality Management Plan, and coordinating Puget Sound Management Plan implementation among agencies.   Among the issues addressed in the Puget Sound Plan, and by the Puget Sound Action Team, are several issues related to marine nearshore habitat monitoring, protection, and research. These include the Puget Sound Ambient Monitoring Program (PSAMP), the Marine Nearshore Habitat Loss Workgroup, and the Marine Protected Areas Workgroup.

Lower Columbia River Estuary Program & Plan
The National Estuary Program, enabled by the Clean Water Act, is designed to encourage local communities to take responsibility for managing their own estuaries. In 1995, the lower Columbia River estuary was nominated and accepted into the National Estuary Program. The Lower Columbia River Estuary Program released a bi-state, multi-interest cooperative Management Plan in 1999 that details the issues and threats facing the estuary, and specific actions for addressing these problems. One of the Management Plan's priority actions is the inventory and assessment of marine nearshore habitat in the estuary.