

---

# Peer Review Plan for Feasibility Study of Puget Sound Marine Nearshore Habitat Restoration, WA

---

PUGET SOUND  
NEARSHORE  
PARTNERSHIP



RESTORING OUR  
ECOSYSTEM HEALTH

Dated: 25 Sep 07

---

---

## 1. INTRODUCTION

The Puget Sound basin is located in northwestern Washington and is bounded by Whatcom, Skagit, Snohomish, King, Pierce, Thurston, Mason, Kitsap, Jefferson, Clallam, Island, and San Juan counties. The purpose of the Puget Sound Marine Nearshore Habitat Restoration Project (i.e. Nearshore or PSNERP) is to provide ecosystem restoration that will reverse the decline in function of targeted Puget Sound nearshore ecosystem processes.

The purpose of the Nearshore feasibility study is first to evaluate significant ecosystem degradation in the Puget Sound Basin. Then, the project team will formulate, evaluate, and compare potential solutions to these problems in order to recommend a series of actions and projects that have federal interest and are supported by a non-Federal sponsor. The recommended plan must significantly contribute to the identified restoration objectives of restoring nearshore habitat of Puget Sound for the benefit of the biological resources and the integrity of the ecosystem, including the functions and natural processes of the basin; additionally the plan must be both technically viable and economically sound.

The purpose of the peer review plan is to assign the appropriate level and review independence, establish the procedures, and assign responsibilities for conducting the independent technical and external peer reviews (ITR and EPR, respectively) to ensure the quality and credibility of all decision documents developed during the General Investigation (GI). This plan is compliant with EC 1105-2-408 *Peer Review of Decision Documents*, 31 May 2005, section 6, parts a. through j. This plan also is compliant with the 30 March 2007 USACE Civil Works-Civil Planning memorandum *Peer Review Process* and the 20 April 2007 USACE Northwestern Division memorandum *Peer Review Process*. The peer review plan is part of the Project Management Plan (PMP). Once approved, the plan will be provided to the public on Seattle District's website with a link to the Corps' Planning Center of Expertise.

The project delivery team is presented in Table 1. The Seattle District Project Manager is the project main point of contact for more information about this project and the peer review plan and can be telephoned at 206-764-6839. The Technical Point of Contact for the Ecosystem Planning Center of Expertise can telephoned at (601) 634-5854.

<b>TABLE 1 <sup>1/</sup></b>	
<b>FEASIBILITY PHASE PROJECT DELIVERY TEAM</b>	
<b>DISCIPLINE</b>	<b>OFFICE/AGENCY</b>
Project Manager	Corps of Engineers
Program Manager (GI)	Corps of Engineers
Program Analyst	Corps of Engineers

<b>TABLE 1 <sup>1/</sup></b>	
<b>FEASIBILITY PHASE PROJECT DELIVERY TEAM</b>	
<b>DISCIPLINE</b>	<b>OFFICE/AGENCY</b>
Plan Formulation	Corps of Engineers
Environmental Coordinator	Corps of Engineers
Environmental Resources	Corps of Engineers
Cultural Resources	Corps of Engineers
Fish & Wildlife	Corps of Engineers
Survey/ CADD Mapping/GIS	Corps of Engineers
GIS	Corps of Engineers
Economic Evaluation	Corps of Engineers
Public Affairs	Corps of Engineers
Office of Counsel	
Cost Engineering	Corps of Engineers
Real Estate	Corps of Engineers
Hydraulic Engineering	Corps of Engineers
Construction	Corps of Engineers
Coastal Engineering	Corps of Engineers
Non-Federal Sponsor: Program Manager	Washington Department of Fish & Wildlife
Non-Federal Sponsor: Project Manager	Washington Department of Fish & Wildlife

<sup>1/</sup> A full list of Nearshore Partnership team members can be found at [www.pugetsoundnearshore.com](http://www.pugetsoundnearshore.com).

## **2. PROJECT SIGNIFICANCE**

The GI Feasibility Report (FR)/ Environmental Impact Statement (EIS) will reflect the results of a comprehensive study of the Puget Sound nearshore. The project team includes interdisciplinary scientists who are active researchers of the Puget Sound. Before the project investigation began, issues of the Puget Sound nearshore were weakly synthesized in forms of limited usefulness to the diverse, active restoration community. During the investigation, many documents have been produced by the project team to guide on-going restoration decisions by the State of Washington and others. To assure high quality, creditable scientific documents each document is reviewed by the author's peers. The Nearshore General Investigation continues to be an influential scientific assessment with broad interest from federal and state agencies, including the State of Washington agency, Puget Sound Partnership, and the associated federal agency group, the Puget Sound Federal Caucus.

The effects of human development on manifested natural Puget Sound geomorphological and hydrological processes are central to the investigation. Other large-scale restoration projects -- like those in Chesapeake Bay, the Great Lakes,

---

---

Everglades, Coastal Louisiana, and San Francisco Bay -- are also addressing natural process restoration; yet, many issues within Puget Sound are unique or are being addressed in novel ways. The cumulative benefits of actions guided by the investigation are expected to significantly contribute to the region's social, environmental and possibly economic well-being. The project provides a more integrated understanding of the many, interrelated, complex human actions which have contributed to ecological decline than previous attempts.

The Nearshore project construction authorization may be more than one-billion dollars (\$1,000,000,000), based on the non-Federal sponsor's (Washington State Department of Fish and Wildlife) project fact sheets.

Therefore, the GI phase documents (i.e. the without project report, the with-plan report, and the Draft EIS/FR) and major engineering products meet the criteria for external peer review (EPR) and will require review by both ITR and EPR teams.

### **3. REVIEW SCHEDULE**

ITRs and EPRs will be conducted for all major GI phase documents (i.e. without project report, feasibility scoping documents, plan selection report, and Draft EIS/FR) and major engineering and scientific documents and products. The complete schedule is included in the Final Project Management Plan which can be found at <http://www.pugetsoundnearshore.org/>

The major feasibility study milestones are shown below, however; public peer review (including other agencies, tribes, non-profit organizations and the public attending project workshops, seminars or visiting the project web site) is managed as on-going activities of the investigation.

July 2008	Project Conditions Report (Historic, Current, Future Without Project)
November 2008	Feasibility Scoping Meeting
August 2009	Alternative Formulation Briefing
April 2010	Draft Feasibility Report

#### 4. EXTERNAL PEER REVIEW

The project began in 2001, prior to issuance of EC 1105-2-408 and the establishment of required PCX managed/conducted ITR/EPR. The project has an established procedure for incorporating peer review and has funds budgeted for that review. Appendix A describes the PSNERP Peer Review process that is currently being followed.

There are three types of review: 1) Proposal or Product; 2) Strategic Science Review and 3) Program Review. The types of reviewers include - Nearshore Science Team (NST) or Workgroup(s); Individual NST member(s); Science Editor; and External Reviewer(s).

Table 2 describes the types of peer review conducted on published papers to-date and the types of individuals who performed each review. Table 3 is a similar table which outlines the documents currently being reviewed.

<b>Table 2 <sup>2/</sup></b>	
<b>Published documents</b>	<b>Type of review conducted Reviewers</b>
<i>Application of the "best available science" in ecosystem restoration: lessons learned from large-scale restoration project efforts in the US</i>	2) Strategic Science Review – NST, 6 external reviewers, nationally recognized scientists
<i>Guidance for Protection and Restoration of the Nearshore Ecosystems of Puget Sound</i>	1) Product NST 1-3 external reviewers
<i>Guiding Restoration Principles</i>	1) Product NST 2-3 external reviewers
<i>Historic Characterization of WRIA 9 Shoreline Landforms</i>	1) Product NST 1 external reviewer
<i>Coastal Habitats in Puget Sound: A Research Plan in Support of the Puget Sound Nearshore Partnership</i>	2) Strategic Science NST USGS Multiple external reviews
<i>The Geomorphology of Puget Sound Beaches</i>	1) Product 2 NST 2-3 external reviewer
<i>Conceptual Model for Assessing Restoration of Puget Sound Nearshore Ecosystems</i>	2) Strategic Science NST Multiple external reviewers Workgroups

<b>Table 2 <sup>2/</sup></b>	
<b>Published documents</b>	<b>Type of review conducted Reviewers</b>
<i>Native Shellfish in Nearshore Ecosystems of Washington State</i>	1) Product NST 2 individual members 1 external reviewer
<i>Nearshore Birds in Puget Sound</i>	1) Product 2 NST members Science editor 1 external
<i>Juvenile Pacific Salmon and the Nearshore Ecosystem of Puget Sound</i>	1) Product 2 NST Science editor 1 external
<i>Historical Reconstruction, Classification and Change Analysis of Puget Sound Tidal Marshes</i>	1) Product Individual NST members External agency Workgroup
<i>Puget Sound Annotated Bibliography</i>	1) Product Individual NST members
<i>Marine Riparian Vegetation Communities</i>	1) Product 2 NST members Science editor 1 external reviewer
<i>Native Shellfish in Nearshore Ecosystems of Washington State</i>	1) Product 2 NST members Science editor 1 external reviewer
<i>Nearshore Birds in Puget Sound</i>	1) Product 2 NST members Science editor 1 external reviewer
<i>Juvenile Pacific Salmon and the Nearshore Ecosystem of Puget Sound</i>	1) Product 2 NST members Science editor 1 external reviewer
<i>Kelp &amp; Eelgrass</i>	1) Product 2 NST members Science editor 1 external reviewer

<b>Table 2 <sup>2/</sup></b>	
<b>Published documents</b>	<b>Type of review conducted Reviewers</b>
<i>Valuing Puget Sound's Valued Ecosystem Components</i>	1) Product 2 NST members Science editor 1 external reviewer
<i>Beaches and Bluffs of Puget Sound and the Northern Straits Valued Ecosystem Component of Washington State</i>	1) Product 2 NST members Science editor 1 external reviewer
<i>Orcas in Puget Sound</i>	1) Product 2 NST members Science editor 1 external reviewer
<i>Great Blue Heron</i>	1) Product 2 NST members Science editor 1 external reviewer
<i>Valued Ecosystem Component White Paper Marine Forage Fishes</i>	1) Product 2 NST members Science editor 1 external reviewer

<b>Table 3 <sup>2/</sup></b>	
<b>Documents currently under review</b>	<b>Type of review Reviewers</b>
<i>A Geomorphic Typology of Puget Sound Nearshore Landforms</i>	1) Product 2 NST members 3 external reviewers

<sup>2/</sup> Appendix B includes a complete bibliography of the documents listed in Tables 2 and 3.

## 5. PUBLIC REVIEW OPPORTUNITIES

The public has actively participated in the on-going external peer review process already part of the PSNERP GI project. Venues for soliciting comments are varied and range from passive collection of comments at the public website to actively requesting that another agency manage an EPR with a team of reviewers selected by the agency. Examples of the types of review that PSNERP documents undergo are:

- Public review of published documents at <http://www.pugetsoundnearshore.org/>
- External Peer Reviews that are managed by Washington Sea Grant and USGS
- Author suggestions to professionally edited manuscripts

- 
- 
- Public presentations and document submittal to Washington State Salmon Recovery Funding Board (SRFBoard), Washington State Governor’s Puget Sound and Georgia Basin bi-annual research conferences, National Ecosystem Restoration Conference, and Estuary and Salmon Recovery Program (ESRP) workshops at six Puget Sound locations, and other public venues.

The public will be invited to comment directly to the PDT through public scoping meetings and public review periods programmed into the feasibility schedule. Although resources have been programmed for a public review of the Final FR/EIS, a public review of the final EIS/FR will not be conducted unless the final document is significantly different from the draft.

## **6. AVAILABILITY OF PUBLIC COMMENTS TO ITR TEAM**

Public input from the NEPA workshops and the public scoping meetings will be available to the ITR members to ensure that public comments have been considered in the development of interim products and the draft FR/EIS. However, the draft FR/EIS will be independently reviewed prior to the conclusion of the public comment period, and, therefore, these comments will not be available to the ITR members. In the event that the final FR/EIS is significantly revised from the draft, another ITR will be scheduled and public comment on the draft will be available to the reviewers.

## **7. ANTICIPATED NUMBER OF REVIEWERS**

The current ITR plan includes 12 independent reviewers corresponding to the disciplines required to develop the feasibility products and the FR/EIS.

## **8. PRIMARY DISCIPLINES AND EXPERTISE NEEDED FOR THE ITR**

The disciplines and expertise required for the ITR team are presented in Table 4.

**TABLE 4. INDEPENDENT TECHNICAL REVIEW TEAM  
Discipline**

Review Team Leader  
Plan Formulation  
Environmental Coordinator  
Cultural Resources  
Civil Design  
Coastal Engineering  
Geotechnical  
Economic Evaluation  
Cost Engineering  
Real Estate



---

---

**Discipline**  
Sponsor WDFW  
Hydraulics and Hydrology

The Independent Technical Review Team will be selected based on their knowledge, skills, and experience necessary to perform the task and their lack of affiliation with the development of the feasibility report/EIS and associated appendixes. Seattle District will recommend ITR members to the MSC and PCX. The PCX will confirm the quality and adequacy of the ITR members. Funding their participation may include travel to Seattle District for the review conference. All ITRs will be completed through DRCHECKS where comments and comment resolution are captured.

Technical review will use appropriate analytical methods for each technical area. Technical review will rely on periodic technical review team meetings to discuss critical plan formulation or other project decisions, and on the review of the written feasibility report documentation and files. Independent technical review will ensure that:

- the feasibility report/EIS is consistent with current criteria, procedures and policy
- clearly justified and valid assumptions that are in accordance with established guidance and policy have been utilized, with any deviations clearly identified and properly approved
- concepts, features, analytical methods, analyses, and details are appropriate, fully coordinated, and correct
- problems/issues are properly defined and scoped
- conclusions and recommendations are reasonable and justified.

Appendix A provides a detailed proposed ITR and EPR plan developed by the Nearshore Science Team.

## **9. EXTERNAL PEER REVIEWERS**

TABLE 5 EXTERNAL PEER REVIEW TEAM  
DISCIPLINE

Planning Center of Expertise, Point of Contacts
Coastal Physical Oceanography or Wetland Hydrology
Geomorphology or Sedimentology
Coastal Systems Ecology
Restoration Engineering
Fish and Wildlife Ecology
Information Management

---

---

DISCIPLINE  
Socioeconomics

**10. PUBLIC SELECTION OF PEER REVIEWERS**

Public suggestions have been received for individual peers. Direct public comments about the document content have been incorporated, as appropriate, into the current documents. The Nearshore Science Team has requested public agencies to manage EPRs and return comments to the authors for incorporation. Agencies that have conducted and managed EPRs are Washington Sea Grant and USGS. MSC, with concurrence from PCX and NWS, tentatively concurs that EPR is consistent with Corps policy and will be done for the Nearshore project.

**11. FEDERAL ADVISORY COMMITTEE ACT**

Because the PSNER team includes members that are not Federal, State, local, or Tribal government employees the Federal Advisory Committee Act (FACA) may apply. However, the project organization and charter has been developed with the help of district counsel to avoid potential FACA conflicts. In the future, if there is uncertain about whether or not FACA applies to a particular external peer review, questions regarding applicability of FACA will be addressed to the Seattle District Office of Counsel.

**12. MODEL CERTIFICATION:**

Project team has not identified models to be used for the investigation. If models are subsequently identified, the plan will be modified to explain the certification process.

**13. IMPLEMENTATION COST CRITERIA EVALUATION FOR DETERMINING NECESSITY FOR EPR:**

Currently implementation costs of a future authorized project are estimate by the non-Federal sponsor to exceed \$1,000,000,000 (one-billion dollars). This is not an “official” Corps of Engineers estimate, instead a rough order of magnitude estimate used solely to determine whether the cost criteria for EPR alone would necessitate conducting an EPR. Since the non-Federal sponsor’s project cost estimate exceeds the policy criteria, currently \$50,000,000 (50-million dollars), the project will require an EPR.

**14. COST ESTIMATING DIRECTORY OF EXPERTISE:**

The project feasibility report cost estimate will be reviewed by the NWW Cost Estimating Directory of Expertise.

## **Puget Sound Marine Nearshore Habitat Restoration Project (PSNERP) Peer Review**

### **INTRODUCTION**

***The Nearshore Science Team (NST) of the Puget Sound Marine Nearshore Habitat Restoration Project (PSNERP) proposes to the PSNERP Management Team and other authorizing entities that the PSNERP formally institute both internal (research and product review by agency, non-profit, tribal, and academic team members who have been involved in the investigation) and external (program review by qualified individuals who have not been involved in developing products for the investigation) peer review to see the Project through the completion of the General Investigation. Certain aspects of PSNERP governance already receive strict, formalized peer review (e.g., US Army Corps of Engineers competitive contractor selection) or presently have a reasonable peer review process (e.g., Valued Ecosystem Component white paper review). However, the Project's strategic science and overall program structure and direction, especially as developing in the General Investigation would benefit from a peer review. This NST statement and proposal addresses all levels of peer review but is particularly focused at the Project's needs at the programmatic level.***

Peer review is a fundamental tenet of good science around the world. Independent peer review is the accepted tool for rigorous, impartial evaluation of scholarly manuscripts, research proposals, complex institutional research programs, faculty promotion and most other decisions affecting how science is conducted and used to address human needs and problems.

As described in a recent Ecological Society of America (ESA) Public Affairs Office briefing to the US Congress<sup>1</sup>, "Peer review is an integral component of scientific research and publishing. It allows the scientific community to maintain quality control of research through the review of research proposals, journal manuscripts and other reports. Academic peer review, although far from perfect, is the best tool scientists have to ensure high standards for their professional work."

Adherence to peer review is sometimes less than perfect in applied disciplines compared to basic science and engineering, with predictable effects on credibility in the eyes of the scientific community.

Restoration of Puget Sound nearshore ecosystems as developed under PSNERP will involve extensive assessment of scientific direction and priorities, and scrutiny of background science and restoration performance; all of these aspects demand some level and type of peer review. Peer review should:

- ensure that the "best available science<sup>2</sup>" is pursued;
- avoid potential conflicts of interest; and,
- minimize the influence of other, subjective factors, such as funding source.

---

<sup>1</sup> ESA Bulletin 86(1), January 2005; see: <http://www.esapubs.org/bulletin/current/current.htm>

<sup>2</sup> See US federal and other institutional/legal definitions; Lessons Learned document (PSNERP-NST 2005) also provides detailed definition.

## FORMS OF PEER REVIEW

Peer review can be implemented in many forms, with various means of affecting decision processes. Any program such as PSNERP should incorporate peer review input at several levels in the PSNERP organizational structure: (1) research proposal ranking and selection; (2) technical report and other product review; (3) strategic science approach review; and (4) program review.

### Decisions of Selection or Ranking

Any decision based on scientific and technical merit, such as evaluation of research proposals, should be based in peer review. Through peer review, the difficult decisions about research funding allocation and dissemination of results can be objectively based on scientific validity, originality, and importance. Examples from the NST Lessons Learned assessment of large-scale, ecosystem restoration programs (Van Cleve *et al* 2003) would include the CALFED Ecosystem Restoration Program procedures for selecting restoration projects to implement in the San Francisco Bay-Delta.

Ideally, the peer-review process should involve scientists (individually and as a body) who: (1) have no conflict of interest with any of the proposal or study participants; and, (2) preferably, have regional expertise directly applicable to the decision topic. This is not always feasible in a region with a limited number of technical experts, most of whom have some level of conflict of interest (e.g., are research colleagues, are involved in competing proposals, are from the same institution or have long-term affiliations). Thus, review by peers external to the region is often required to ensure impartiality.

Such peer review typically occurs either through (a) mail review, (b) assembled panel review, or (c) a combination of both. Relative ranking and narrative discussion (or completions of a systematic form, in a few cases) are generated for each proposal. In the case of mail and panel review, the mail reviews are typically used for initial screening; subsequent resolution of decisions requires more in-depth discussion of the strengths and weaknesses of each proposal. The following are example criteria that are used to assess the relative merits of a research proposal or manuscript describing research results:

- examines an important scientific issue
- study is original
- directly tests hypothesis
- study design (sample size, control, feasibility) is capable of testing hypothesis and statistical approach is appropriate
- study not compromised by impediments to implementing study design
- no conflict of interest

Although peer reviewers may comment on other aspects, such as budget feasibility or sociological factors, these should not be considered scientific decision factors (e.g., these issues are often left to program managers).

Confidentiality is a fundamental requirement of most peer review of this type, although reviewers may agree to provide their identification under some circumstances. Scientific and professional societies (that publish peer-review journals) and institutions often acknowledge reviewers by listing them, but they seldom identify reviewers with specific decisions.

### Product Review

The second internal need for formalized peer review is to ensure the scientific credibility of PSNERP products, such as guidance documents, technical reports and data/metadata.

The following principles are proposed as a basis for responsible peer review. Peer review must be characterized by:

1. Effectiveness—an effective process for peer review is essential to promote academic integrity
2. Competence—reviewers should have the expertise to provide an authoritative review
3. Usefulness—procedures for reviews will be followed in a timely fashion and that reviewers' comments will be constructive
4. Security—has confidence that the peer review process minimizes the risks of bias and that reviewers will not take unfair advantage of privileged information

Many organizations and institutions have guidelines dealing explicitly with the responsibilities of peer reviewers, such as those of the American Chemical Society (1996), the Society for Neuroscience (1999), and the Council of Biology Editors (CBE Peer Review Retreat Consensus Group, 1995). Some of these documents and the principles discussed above are a basis for guidelines that should be followed by peer reviewers<sup>3</sup>:

1. Responsive  
Reviewers are responsible for following the instructions for completing a review and doing so in a timely fashion. Failing to do so undermines the review process.
2. Competent  
Although a reviewer may not be an expert in every aspect of the review, the assignment should be accepted only if he or she has adequate expertise to provide an authoritative assessment. A reviewer who does not have the requisite expertise is at risk of accepting a submission that has substantial deficiencies or rejecting one that is meritorious.
3. Unbiased  
Reviewers' comments and conclusions should be based on an objective consideration of the facts, exclusive of personal or professional bias. To the extent possible, the system of review should be designed to minimize actual or perceived bias on the reviewer's part.
4. Confidential  
Material under review should not be shared or discussed with anyone outside the designated review process unless necessary and approved by the editor, funding agency, or academic institution. Material submitted for peer review is a privileged communication that should be treated in confidence.
5. Secure  
A reviewer should not take scientific, financial, personal, or other advantage of material available through the privileged communication of peer review.

---

<sup>3</sup> Modified from USCD Responsible Conduct of Research Education Committee, <http://ethics.ucsd.edu/courses/integrity/assignments/review.html>

6. Constructive  
Reviewers' comments should acknowledge positive aspects of the material under review, assess negative aspects constructively, and indicate clearly the improvements needed.
7. Responsible  
Peer review depends, by definition, on the willingness of peers to participate as reviewers, usually without financial compensation. Nominal compensation is not unusual in governmental review processes, however.

### Scientific Strategy and Direction

Peer review can also be a critically important aspect of program guidance, contributing to pivotal decisions and advising on strategic directions. Such guidance typically involves a body (formal committee or panel) of experts from outside the region, who are completely disassociated with the program but familiar with the ecosystems and scientific concepts required to address the regional issues. Such peer review can serve internal direction in (1) an *advisory* role or can (2) provide critical *review* of program progress and performance. In addition, these roles may be exercised *internally* (operating as an explicit component of the organizational structure) or *externally* (operating outside of the organizational structure, reporting to an over-seeing or independent body). Examples from the Van Cleve *et al.* (2003) Lessons Learned assessment include the advisory role of the National Technical Review Committee (NTRC) that is an internal component of the Louisiana Coastal Area Ecosystem Restoration Program (LCA) and the review role of the external National Academy of Sciences, National Research Council (NRC) independent review of the LCA.

There are some significant differences in the internal advisory vs. external review roles:

- Internal advisory bodies do not always examine the fine detail aspects of a program, but more the program's fundamental goals and objectives, the strategic approach to addressing them and the organization structure and decision-making process. When applied most effectively, advisors are involved early in the program and meet periodically to review the program at critical stages, in an adaptive mode. Reporting is often brief and often the most critical exchange is verbal review with the program staff. They often report directly to a program's technical staff, but copy their advice to management levels.
- External review bodies typically evaluate a program nearing its completion, or at least late in its maturity. The primary goal is often to assess whether or not the program has met its goals and objectives, and to provide pivotal evaluation for the decision of whether or not to continue a program. Such review panels or committees may stipulate their own approach to assessing the program, independent of the program or its sponsor.

One example of how these different levels of peer review can contribute to the integrity of a large, ecosystem restoration program is illustrated by the South Bay Salt Pond Restoration Project's<sup>4</sup> Program Plan (Fig. 1). In this case, the Science Team is the

---

<sup>4</sup> See <http://www.southbayrestoration.org/index.html>

Project's internal core advisory group. It is a large team, under the direction of a Lead Scientist, who together provide technical support, knowledge-building, and peer review support to the Project Management Team, Stakeholder Forum, and technical Work Groups. The Science Team functions in a technical advisory and peer review role and is prohibited from participating on any consultant teams that are hired to design elements of the plan and/or undertake environmental compliance work. The external National Science Panel, on the other hand, is composed of national and locally-recognized experts familiar with large-scale wetlands restoration efforts and knowledgeable about application of adaptive management protocols and long-term monitoring. The Panel's role is to provide critical science oversight to the overall planning process and periodic review of local technical investigations pertaining to the restoration plan design.

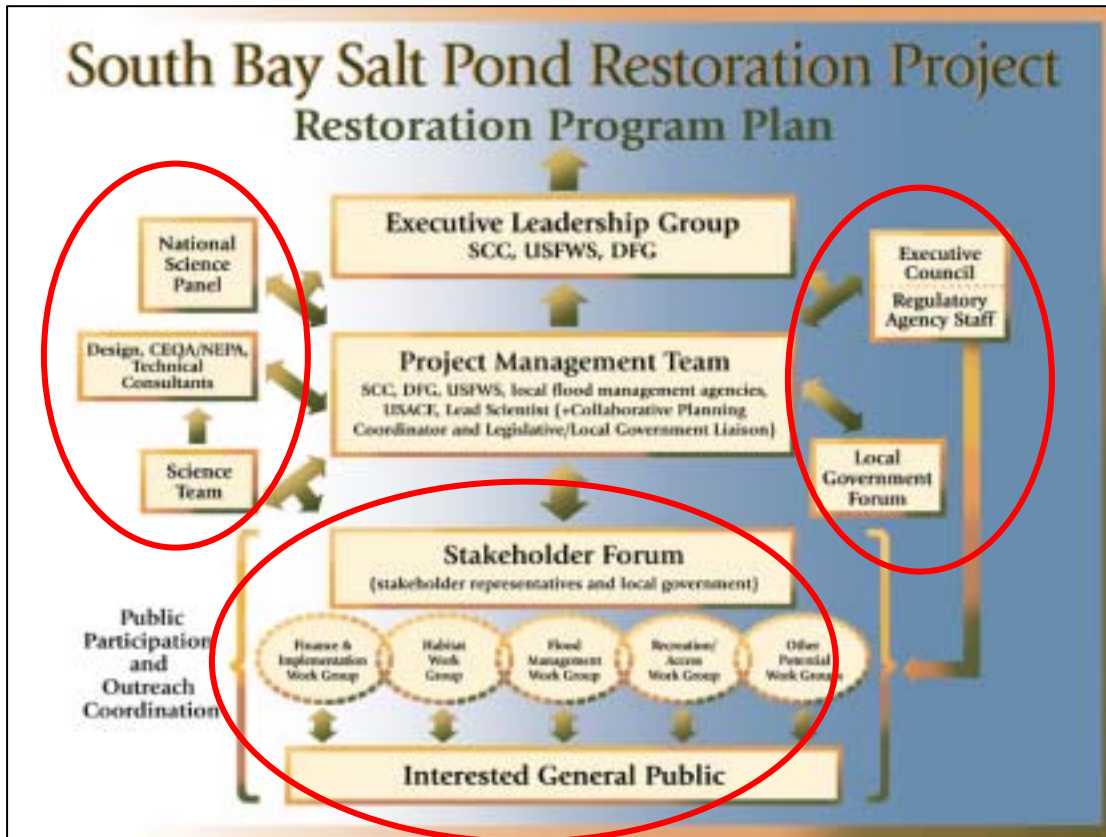


Figure 1. Structure of South Bay Salt Pond Restoration Program, indicating position of peer-review and advisory bodies within overall organizational structure.

### Programmatic Structure

Designing the structure of a complex restoration program, such as the PSNERP General Investigation, is a difficult task with seemingly endless alternatives to integrating and balancing science, management, governance and evaluation (VanCleve *et al.* 2004).

### PSNERP Peer Review

**The integrity and effectiveness of scientific investigations associated with PSNERP require peer review, preferably in the multiple programmatic levels described above.** We recommend that PSNERP establish peer review at three levels:

1. Proposal and Product Review
2. Strategic Science Review
3. Program Review

*Research Proposal and Product Review would provide the periodic review required for proposals and products from and to PSNERP. These would be based on an internal review process conducted by anonymous, independent experts not associated with the program.*



To prevent real or perceived conflict of interest, reviewers would be limited to individuals not related to any on-going PSNER research or other direct or contractual activities. The reviewers and their disciplines would vary depending upon the topic of the review, but their expertise should overlap extensively with the proposal or product topic. Review of PSNER products (e.g., reports, manuscripts, datasets) would typically be based on mail/e-mail exchanges. Proposal reviews would likely involve a combination of mail/e-mail review and panel meetings. Review participants may be volunteers (as is often the case for proposal and manuscript review if volunteers are allowed to donate their labors by applicable Federal and State laws) or be compensated on a review-by-review basis.

*Strategic Science Review* would involve a standing panel or committee of nationally-recognized technical experts that would be incorporated at the early stages of the PSNER. These experts would provide scientific guidance and oversight of the overall program, particularly at critical stages in formulation and implementation of science initiatives. Preferably, the composition would be multidisciplinary, including at least the following scientific disciplines: coastal physical oceanography or wetland hydrology; geomorphology or sedimentology; coastal systems ecology; restoration engineering; fish and wildlife ecology; information management; and socioeconomics. Members would be drawn from both the region and the nation as available; as in the other peer review, strict conflict of interest rules would also apply to Strategic Science Review panelists. They would meet periodically (e.g., at least twice per year) to review both status of the PSNER science (e.g., *vis a vis* a PSNER "all-scientists" meeting) but also at important junctures in evolution of the Science Plan. The panel would interact principally with the PSNER technical staff and participants but report their assessments and recommendations directly to the PSNER steering and management levels. Participants would be compensated on an on-going contractual basis.

*Program Review* would require a less frequent (e.g., every other year?) assessment than the *Strategic Science Review* but would address the broader goals and purposes of the PSNER on the scale of a NRC review but with continued involvement rather than a one-time review. It would be composed of both national (or international?) and regional experts, including representatives of scientific and technical expertise, social scientists and stakeholders. Optimally, members would have some experience in large, ecosystem-scale restoration in other regions (as might be represented by key individuals involved in the case study programs reviewed in Van Cleve *et al.* 2003). While their background should be science based, their perspective should be programmatic, e.g., to ensure that science is most effectively deployed and managed toward the goals of the PSNER. They would report principally to program management. Participants would be compensated on an on-going contractual basis for each review period.

### Summary

In considering the applicability and need of rigorous peer review in PSNERP, we echo the recent ESA<sup>1</sup> recommendations, paraphrased here:

- 1. Engage the most competent scientists, to ensure that they bring the necessary scientific knowledge and objectivity to reviewing the matter at hand.**
- 2. Insulate the scientific review process from politics as much as possible, with oversight vested in scientists and science managers.** "The agencies must be

trusted to perform the task of constituting and overseeing fair and independent scientific peer review efforts, without interference from political entities."

3. **Recognize that even the best scientific peer review cannot give policy makers the "right" answer.** But, it can provide assurances that rigorous conclusions logically follow from the results.
4. **Scientific peer review must have programmatic flexibility.** Overly rigid programmatic processes for scientific peer review of the body of science underlying policy decisions will result in inefficient use of time and resources. For example, it may be overly prescriptive to stipulate the number of reviewers, how they are selected, the questions they must answer, or the type of report they must produce.
5. **All scientific peer review must be based upon an assumption of integrity.** Fair reviews are the product of professional standards of conduct that are a fundamental component of training in scientific research, and the credibility of scientific peer review will ultimately rest on the presumed integrity of the reviewers.
6. **Acknowledge the differences in professional culture that often divide scientists, policy makers, and the public.** Science is inherently uncertain and there will always be unanswered questions and areas where more research is needed. However, acknowledging uncertainty should not be equated with an inability to draw conclusions; managers often must act without complete certainty. Scientific peer review, properly earned out by competent peer scientists, can reassure managers, decision makers, and the public that such difficult decisions are based on research that represents the current state of our scientific understanding. The academic model of peer review calls on reviewers to be as critical as possible. Results from scientific peer review that highlight uncertainties, questions, and alternative explanations do not mean that the science was not well done or that its findings are invalid. Authors are able to make improvements where they can and so that the weaknesses of the work are understood and acknowledged.

#### REFERENCES

- Van Cleve, F. B., C. Simenstad, F. Goetz and T. Mumford. 2004. Application of the "best available science" in ecosystem restoration: lessons learned from large-scale restoration project efforts in the US. Tech. Rep. 2004-01, Puget Sound Nearshore Partnership, Olympia, WA. 34 pp.

DOCUMENTS THAT HAVE UNDERGONE  
PUGET SOUND MARINE NEARSHORE  
HABITAT RESTORATION PROJECT (PSNERP)  
EXTERNAL PEER REVIEW  
CONDUCTED BY VARIOUS ENTITIES

Buchanan, J.B. 2006. Nearshore Birds in Puget Sound. Puget Sound Nearshore Partnership Report No. 2006-05. Published by Seattle District, U.S. Army Corps of Engineers, Seattle, Washington. 23pp.

Collins, B. D., A. J. Sheikh. 2005. *Historical Reconstruction, Classification and Change Analysis of Puget Sound Tidal Marshes*. Washington Department of Natural Resources, Aquatic Lands Division. 120pp.

Dethier, M.N. 2006. Native Shellfish in Nearshore Ecosystems of Washington State. Puget Sound Nearshore Partnership Report No. 2006-04. Published by Seattle District, U.S. Army Corps of Engineers, Seattle, Washington. 23pp.

Finlayson, D. 2006. *The Geomorphology of Puget Sound Beaches*. Tech. Rep. 2006-02, Puget Sound Nearshore Partnership, Olympia, WA. 55pp.

Fresh, K.L. 2006. Juvenile Pacific Salmon in Puget Sound. Puget Sound Nearshore Partnership Report No. 2006-06. Published by Seattle District, U.S. Army Corps of Engineers, Seattle, Washington. 27pp.

Fresh, K. 2004. *Puget Sound Annotated Bibliography*. Puget Sound Action Team. Simenstad, C., M. Logsdon, K. Fresh, H. Shipman, M. Dethier, and J. Newton. 2006. *Conceptual Model for Assessing Restoration of Puget Sound Nearshore Ecosystems*. Tech. Rep. 2006-03, Puget Sound Nearshore Partnership, Olympia, WA. 41pp.

Fresh, K., C. Simenstad, J. Brennan, M. Dethier, G. Gelfenbaum, F. Goetz, M. Logsdon, D. Myers, T. Mumford, J. Newton, H. Shipman, and C. Tanner. 2004. *Guidance for Protection and Restoration of the Nearshore Ecosystems of Puget Sound*. Tech. Rep. 2004-02, Puget Sound Nearshore Partnership, Olympia, WA. 14pp.

Fung, J., and C. Davis. 2005. *Historic Characterization of WRIA 9 Shoreline Landforms*. Tech. Rep. 2005-01, Puget Sound Nearshore Partnership, Olympia, WA. 28pp.

Gelfenbaum, G., T. Mumford, J. Brennan, H. Case, M. Dethier, K. Fresh, F. Goetz, M. van Heeswijk, T. Leschine, M. Logsdon, D. Myers, J. Newton, H. Shipman, C. Simenstad, C. Tanner, and D. Woodson. 2006. *Coastal Habitats in Puget Sound: A Research Plan in Support of the Puget Sound Nearshore Partnership*. Tech. Rep. 2006-01, Puget Sound Nearshore Partnership, Olympia, WA. 50pp.

Goetz, F., C. Tanner, C. Simenstad, K. Fresh, T. Mumford, and M. Logsdon. 2004. *Guiding Restoration Principles*. Tech. Rep. 2004-03, Puget Sound Nearshore Partnership, Olympia, WA. 22pp.

VanCleve, F. B., C. Simenstad, F. Goetz and T. Mumford. 2004. *Application of the "best available science" in ecosystem restoration: lessons learned from large-scale restoration project efforts in the US*. Tech. Rep. 2004-01, Puget Sound Nearshore Partnership, Olympia, WA. 34 pp.

DOCUMENTS CURRENTLY UNDERGOING  
PUGET SOUND MARINE NEARSHORE  
HABITAT RESTORATION PROJECT (PSNERP)  
INITIATED  
EXTERNAL PEER REVIEW  
WITH PUBLICATION EXPECTED IN 2007.

Brennan, J.S. 2007. Marine Riparian Vegetation Communities of Puget Sound. Puget Sound Nearshore Partnership Report No. 2007-02. Published by Seattle District, U.S. Army Corps of Engineers, Seattle, Washington.

Eissinger, A.M. 2007. Great Blue Heron in Puget Sound. Puget Sound Nearshore Partnership Report No. 2007-06. Published by Seattle District, U.S. Army Corps of Engineers, Seattle, Washington.

Mumford, T.F. 2007. Kelp and Eelgrass in Puget Sound. Puget Sound Nearshore Partnership Report No. 2007-05. Published by Seattle District, U.S. Army Corps of Engineers, Seattle, Washington.

Johannessen, J. and A. MacLennan. 2007. Beaches and Bluffs of Puget Sound. Puget Sound Nearshore Partnership Report No. 2007-04. Published by Seattle District, U.S. Army Corps of Engineers, Seattle, Washington.

Kriete, B. 2007. Orcas in Puget Sound. Puget Sound Nearshore Partnership Report No. 2007-01. Published by Seattle District, U.S. Army Corps of Engineers, Seattle, Washington.

Leschine, T.M., A.W. Petersen, and K. Hoffman. 2007. Valuing Puget Sound's Valued Ecosystem Components. Puget Sound Nearshore Partnership Report No. 2007-07. Published by Seattle District, U.S. Army Corps of Engineers, Seattle, Washington.

Penttila, D. 2007. Marine Forage Fishes in Puget Sound. Puget Sound Nearshore Partnership Report No. 2007-03. Published by Seattle District, U.S. Army Corps of Engineers, Seattle, Washington.

Shipman, H. *A Geomorphic Typology of Puget Sound Nearshore Landforms*. Puget Sound Nearshore Partnership Report No. 2007-08. Published by Seattle District, U.S. Army Corps of Engineers, Seattle, Washington.