

PUGET SOUND
nearshore
PROJECT



A partnership between the citizens and governments of the State of Washington and the U.S. Army Corps of Engineers and other federal agencies.

PSNERP Work Plan: A Strategy for Restoration of the Puget Sound

Working Draft
June 2004 Version

Puget Sound Nearshore Ecosystem Restoration Project
Project Management Team and Steering Committee

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INTRODUCTION

Program Overview

The Puget Sound Nearshore Ecosystem Restoration Program (PSNERP) is a large-scale, comprehensive initiative to protect and restore the natural processes and functions in Puget Sound. The program is constructed around a federal cost share agreement between the U.S. Army Corps of Engineers and the Washington Department of Fish and Wildlife. Six federal agencies are active participants and contributors to the program (U.S. Geological Survey, U.S. Fish and Wildlife Service, National Marine Fisheries Service, Environmental Protection Agency, U.S. Navy, in addition to the Army Corps of Engineers). Non-federal partners include nine state agencies, tribes, local governments, ports, the shellfish industry, and private citizens.

Program Mission, Goals, and Strategies

The Mission of the Puget Sound Nearshore Ecosystem Restoration Program is to:

“Restore and protect the 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.”

The following goals are proposed to guide PSNERP:

1. Protect and/or restore natural processes that create and maintain Puget Sound nearshore ecosystems;
2. Protect and/or restore ecosystem functions and structures that support valued ecosystem components;

The following strategies will be used to achieve PSNERP goals:

1. Increase understanding of the natural processes and functions of the Puget Sound Nearshore;
2. Connect and integrate PSNERP with related restoration and protection efforts;
3. Develop a strategic restoration plan based on a spatially explicit assessment of nearshore ecosystem restoration needs.
4. Secure funding for implementation of actions in the strategic restoration plan;
5. Improve the quality of protection and restoration decision-making through active monitoring and adaptive management.

Program Structure

Ecosystem Restoration Programs developed in partnership with the U.S. Army Corps of Engineers (Corps) are typically divided into five phases: 1) Reconnaissance; 2) Assessment and Feasibility; 3) Engineering, Permitting, and Design; 4) Construction; 5) and Maintenance and Monitoring. The Reconnaissance phase was completed in 2000 and concluded that there is a federal interest in restoration of Puget Sound nearshore ecosystems. In September 2001, the Corps and the Washington Department of Fish and Wildlife, establishing the Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) partnership, signed a cost share agreement.

This Work Plan describes the Assessment and Feasibility phase (also referred to as the “General Investigation” or “G.I.”) which began with signing of the cost share agreement. The G.I. includes three stages: Stage I - Program and Tools Development (Fall, 2001 through Spring, 2004); Stage II - Strategic Needs Analysis (Spring 2004 through Spring, 2006); and Stage III - Plan Completion (Spring 2006 through Summer, 2007). The Plan completed at the end of the G.I. will describe the restoration solutions identified by the Corps and its partners. This will set the stage for federal and local partnerships to implement these solutions.

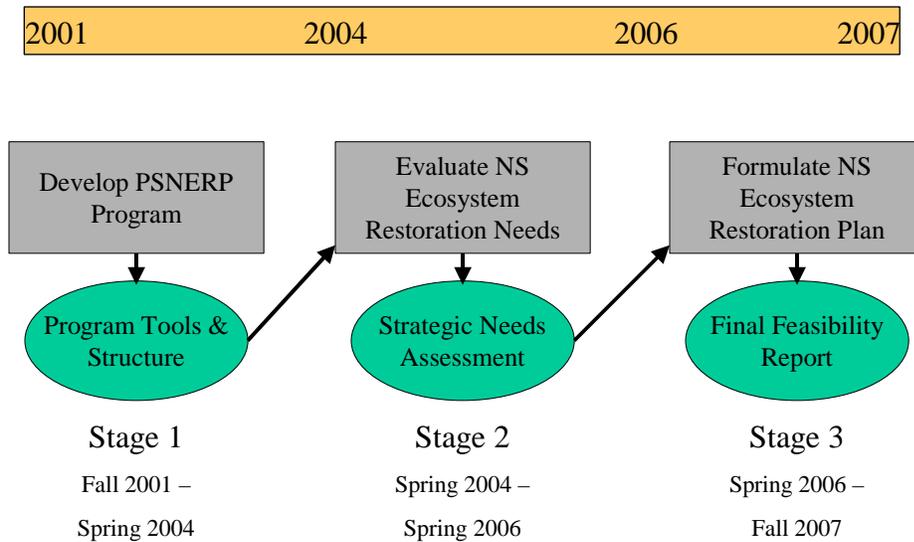


Figure 1: PSNERP Project Timeline.

STAGE I: Program & Tools Development (Fall 2001 - Spring 2004)

Overview

Stage One activities have focused on establishing the organizational and governance structure of PSNERP and developing the tools necessary to develop a strategic restoration plan. In Stage One, team leaders and members were recruited and appointed. This document has been developed as an overall strategic plan for the program; more detailed work plans for specific tasks are being developed as appropriate. Strategic plans will also be developed to guide funding, research, and data management.

The second major Stage I task has been the development of a series of “tools” to assist in the development of the strategic needs analysis in Stage II and the identification of portfolios of priority projects occurring in Stage III.

Program Development

Organizational Structure

The Program is being implemented through an organizational structure based upon the establishment of committees, teams, sub-committees, and work groups. In some instances, these Program elements will complete tasks and develop products directly, in other instances tasks will be completed by contractors, with work being overseen by these groups. Presently these include, but are not limited to:

- Executive Committee
- Steering Committee
- Nearshore Science Team
- Implementation Team
- Project Management Team
- Data Sub-Committee
- Communications Sub-Committee
- Finance Sub-Committee

Current organizational structure and membership composition of the Program can be viewed at www.pugetsoundnearshore.org.

Major Tasks:

Task	Responsible Program Element	Status
Establish organizational entities	Executive Committee	Complete
Recruit and appoint members	Project Management Team; Steering Committee	Complete
Review and revise as necessary	Project Management Team; Steering Committee	In-progress

Policies and Procedures

Policies and Procedures have been developed that establish the role and responsibilities for each program element (e.g. committee, sub-committee, work groups). In addition to the roles and responsibilities, the Policies and Procedures identify membership, meeting frequency, how vacancies are filled, decision-making process, and the rules for participation. Policies and Procedures will be reviewed on an annual basis and updated as necessary.

Major Tasks:

Task	Responsible Program Element	Status
Develop Policies and Procedures Manual	Project Management Team	Complete
Endorse Policy and Procedure Manual	Steering Committee	Complete
Establish Schedule for Review and Update	Project Management Team	Not started
Post and Distribute products	Project Management Team; Communications Sub-Committee	Not started

Science Strategic Plan

A Science Strategic Plan has been established to guide development of a long-term, multi-agency science program, called Coastal Habitats in Puget Sound (CHIPS). This Plan will also define the near-term science needs of PSNERP required for implementation of the technical elements for Stage Two of the G.I.

Major Tasks:

Task	Responsible Program Element	Status
Develop Science Strategic Plan	Nearshore Science Team	Draft
Endorse Science Strategic Plan	Steering Committee	Not started
Post and Distribute products	Project Management Team; Communications Sub-Committee	Not started

Research Plan

A Research plan will be established to guide the acquisition of new or existing data and knowledge to be implemented in Stage II and through the CHIPS program.

Major Tasks:

Task	Responsible Program Element	Status
Identify gaps in existing data	Nearshore Science Team	In-progress
Identify and prioritize near-term data needs	Nearshore Science Team	Not started

Identify and prioritize long-term data needs	Nearshore Science Team	Not started
Develop Research plan	Nearshore Science Team	Not started
Endorse Research plan	Steering Committee	Not started
Post and Distribute products	Program Management Team; Communications Sub-Committee	Not started

Finance Strategic Plan

A financing plan will be developed to guide efforts to identify and secure potential funding sources. The financing plan will cover the full term of the G.I. In addition, the plan will lay the foundation for future decisions regarding financing a large-scale restoration program in Puget Sound.

Major Tasks:

Task	Responsible Program Element	Status
Develop a scope of work	Finance Sub-Committee	Not started
Review and endorse the scope of work	Steering Committee	Not started
Solicit proposals to implement the Scope	Finance Sub-Committee	Not started
Develop a Finance Strategic Plan	Finance Sub-Committee	Not started
Review and endorse Plan	Steering Committee	Not started
Design process to implement Plan	Project Management Team	Not started

Tool Development

Guiding Ecological Principles

A set of guiding ecological principles (GEPs) has been developed which establish the geographical and ecological sideboards for PSNER. These principles, concepts, and assumptions were developed through review of existing scientific and restoration literature. They communicate PSNERP's understanding of nearshore ecosystems and provide a framework for the identification, evaluation, and implementation of restoration and protection actions.

Major Tasks:

Task	Responsible Program Element	Status
Develop draft GEPs	Nearshore Science Team workgroup	Complete
Initial review	Steering Committee	Complete
Develop Final Document	Nearshore Science Team	In-progress
Endorse Final Document	Steering Committee	Not started
Develop summary fact sheet	Communications Team, Project Management Team	Complete
Develop a scientific paper	Nearshore Science Team workgroup	Not started
Post and Distribute products	Project Management Team; Communication Sub-Committee	Not started

Conceptual Model of the Puget Sound Nearshore

The NST is developing a Conceptual Model (CM) of the relationships among natural processes and the structure of Puget Sound nearshore ecosystems. The Conceptual Model will enable the Nearshore Science Team to develop and document a process-based understanding of how the Puget Sound nearshore works. This is expressed in terms of how natural nearshore processes shape the structure (what we see) and the dynamics of the Sound's nearshore (how it changes), how these processes are affected by stressors, and how restoration of degraded processes can restore or improve nearshore function. The Conceptual Model provides a template for understanding the relationships between Valued Ecosystem Components (VECs; see section below) and the nearshore processes that support them. In application to evaluate restoration alternatives, the Conceptual Model provides a tool that can be used to evaluate: (1) the effect of restoration actions on nearshore processes and, ultimately, VECs; (2) the potential interactive and cumulative effects of multiple actions; (3) possible undesirable effects of actions; and (4) the effects of no action.

Major Tasks:

Task	Responsible Program Element	Status
Develop the Puget Sound conceptual model	Nearshore Science Team	In-progress
Develop a fact sheet describing the CM and its application	Implementation Team and Communications Sub-Committee	Complete
Develop an animated version for communicating the CM to the public	Nearshore Science Team-University of Washington	Not started
Develop a draft report on the CM	Nearshore Science Team	In-progress
Develop an interactive tool demonstrating the CM	Communications Sub-Committee	Not started
Post and Distribute products	Project Management Team; Communication Sub-Committee	Not started

Conceptual model DRAFT 3 - July 8, 2003

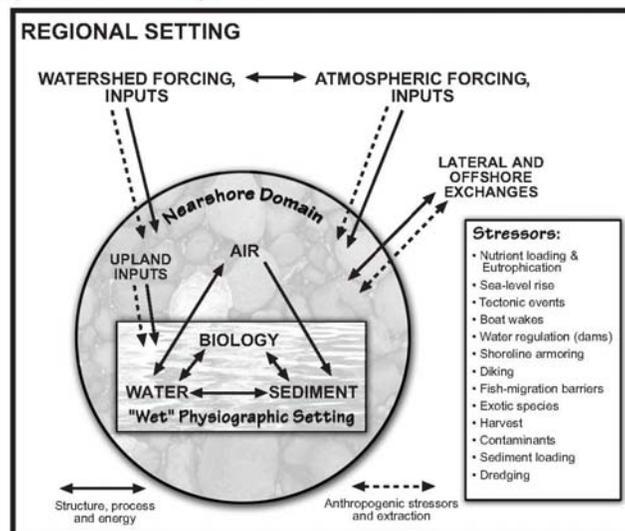


Figure 2: Nearshore Science Team Conceptual Model Level One.

Lessons Learned

A “lessons learned” exercise to characterize the role of science in five other large-scale or national-level programs around the country has been conducted. The programs included in our review were the Chesapeake Bay Program, the Comprehensive Everglades Restoration Plan, the California Bay-Delta Authority, the Glen Canyon Adaptive Management Program, and the Louisiana Coastal Areas Ecosystem Restoration Program. The purpose of this study was to better understand how science is incorporated into program management and organizational structure through a series of interviews and workshops.

Major Tasks:

Task	Responsible Program Element	Status
Develop list of questions	Nearshore Science Team	Complete
Conduct interviews and workshops	Nearshore Science Team, Project Management Team	Complete
Develop summary report	Nearshore Science Team, University of Washington	Complete
Develop recommendations for PSNERP	Nearshore Science Team, University of Washington	Complete
Endorse the report	Steering Committee	Complete
Review recommendations and incorporate into PSNERP work plan	Steering Committee	Complete
Post and Distribute products	Project Management Team, Communication Sub-Committee	In-progress

Nearshore Typology and List of Natural Processes and Types

A “typology” framework will be developed for the nearshore ecosystem to provide a uniform, process based method of classifying shore forms in Puget Sound. This typology will allow for a spatially explicit understanding of predominant nearshore processes as indicated by observed shore forms. Building from the typology, we will construct a list of natural processes important to ecosystem structure and function will be constructed This list will be used to establish links between ecosystem restoration needs and categories of restoration activities, and thus ultimately guide site specific restoration actions.

Major Tasks:

Task	Responsible Program Element	Status
Develop a draft “typology” framework	NST Typology Work Group	Complete
Conduct a technical workshop	Nearshore Science Team	Complete
Solicit comments from ecosystem scientists and restoration practitioners	NST Typology Work Group	In-progress
Develop a nearshore typology report	NST Typology Work Group	In-progress
Endorse typology report	Steering Committee	Not started
Develop a list of important nearshore “natural processes”	Nearshore Science Team	Not started

Post and Distribute products	Project Management Team, Communication Sub-Committee	Not started
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Planning Units at Various Nested Scales

Planning units will be identified at various nested scales by “rolling up” drift cells and other natural process representation to establish a series of nested or hierarchical planning units (i.e. drift cells → nearshore types → shoreline reaches → sub-basins). The boundaries of nested planning units will be based on ecosystem processes, rather than geopolitical boundaries. Using the typology framework to analyze changes in the natural processes which drive the development of nearshore structure and support associated biota, we can identify priority restoration needs for each planning unit within the study area.

Major Tasks:

Task	Responsible Program Element	Status
Identify the smallest geospatial scale as the foundational planning unit	Typology work group	Not started
Identify at the largest possible scale a geographic area affected by the same dominant processes	Nearshore Science Team	Not started
Determine appropriate intermediate scales of analysis	Planning Unit work group	Not started
Develop a reference or naming convention for planning units	Planning Unit work group	Not started
Apply approach to spatial data to produce map of nested planning units	Planning Unit work group	Not started

Valued Ecosystem Components

We will develop a list of Valued Ecosystem Components (VECs). The cause and effect relationships between the natural ecosystem processes in nearshore Puget Sound and the range of factors that limit them are extremely complex. The VEC list will be used largely as a communication tool to translate the benefits of nearshore ecosystem process restoration to more readily understood ecosystem outputs, such as Chinook salmon, forage fish, marine birds, or eelgrass meadows. The VECs will help PSNERP frame the symptoms of declining Puget Sound nearshore ecosystem integrity, explain how ecosystem process are linked to ecosystem outputs, and describe the potential benefits of proposed actions in terms that “make sense” to the broader community.

Major Tasks:

Task	Responsible Program Element	Status
Describe the role VECs will play in PSNERP	Project Management Team, Steering Committee	In-progress
Develop an initial list of VECs	Steering Committee	In-progress
Solicit stakeholder input	Implementation Team	Not started
Review revised list of VECs	Executive Committee	Not started

Endorse the revised list	Steering Committee	Not started
Develop VECs presentation and outreach materials	Steering Committee, Communications Sub-Committee	Not started
Define relationships between individual VECs and nearshore processes	Nearshore Science Team	Not started
Develop a process to review/revise the VEC list	Project Management Team	Not started

Information System Plan

An information system plan framework will be designed to accommodate the data access requirements for the program. The framework will include a portal (on www.pugetsoundnearshore.org) to provide access to existing databases, descriptions of available data (i.e. meta data), and a map-based program to display geospatial data.

Major Tasks:

Task	Responsible Program Element	Status
Design a information system plan framework	Data Sub-Committee	In-progress
Endorse the framework	Steering Committee	Not started
Identify existing priority databases	Nearshore Science Team; Data Sub-Committee	In-progress
Assess accessibility of existing data	Data Sub-Committee	Not started
Review available information management systems	Data Sub-Committee	Not started
Develop a information system strategic plan	Data Sub-Committee	Not started
Endorse information system strategic plan	Steering Committee	Not started

Working with the Broader Restoration Community

We will foster working relationships with the broad “community” of restoration practitioners. These relationships will be used to seek feedback on the emerging PSNERP approach to process based restoration of nearshore ecosystems. Support and endorsement of PSNERP this approach will be pursued if found to be valid and useful to the restoration community. Locally identified opportunities for restoration actions will be evaluated for their ability to address priority nearshore process restoration needs.

Major Tasks:

Task	Responsible Program Element	Status
Develop guidance for nearshore restoration projects	Nearshore Science Team	Complete
Develop a fact sheet describing the guidance document and its application	Implementation Team and Communications Sub-Committee	Complete
Share and discuss guidance, conceptual	Implementation Team	Complete

model, and other aspects of the PSNERP approach with Lead Entities, Marine Resource Committees, Regional Fishery Enhancement Groups and others
Follow initial discussions with periodic updates, requests for project information

In-progress

STAGE II: Strategic Needs Assessment (Spring 2004 thru Spring 2006)

Overview

During Stage II, we will apply concepts and tools developed during Stage I towards an improved understanding of where and how important nearshore ecosystem processes have been altered by human activity in the Puget Sound basin. The outcome of Stage II will be the formulation of a strategic needs assessment that identifies “what is broken” in the Puget Sound Nearshore. This characterization will examine evidence of changes in ecosystem processes at various nested spatial scales (individual drift cells, large reaches of shoreline comprised of multiple drift cells, and at the sub-basin scale, such as southern Puget Sound). This assessment is essential to the formulation of a restoration plan in Stage III.

In addition to directing the efforts of PSNERP towards restoration of ecosystem processes that likely are limiting the ecological capacity of the Puget Sound Nearshore, we anticipate that on-going efforts of the larger restoration community will also benefit from this improved understanding. By providing an assessment of the most pressing restoration needs for different portions of Puget Sound, we hope to provide guidance for this informal “partnership” of entities such as tribes, counties, cities, regional fisheries enhancement groups, lead entities, marine resource committees, non-profit conservation and advocacy groups, and local “friends” groups. PSNERP will then focus Stage III efforts on those needs that are beyond the capacity of local partners and existing restoration programs.

Product Development

A series of “Conditions Analysis” reports represents the primary technical work for the PSNERP Stage II plan for defining the problems in ecosystem processes within the Puget Sound Nearshore. It will seek to identify constraints on nearshore ecosystems by applying the technical tools developed in Stage I towards the characterization of current, historic, and desired future conditions of key nearshore habitats (structure) and processes in Puget Sound. The Stage II Conditions Analysis reports will assist in identifying “what is broken, where, and by what cause” in the Puget Sound Nearshore.

This task can be separated into analysis components based on 1) process – physical, chemical, biological, and socio-economic and 2) time – historic, current, and future. The Conditions Analysis will address four basic questions to meet the Strategic Needs Assessment:

- How have people altered the physical, chemical, and biological processes and resources of the Puget Sound nearshore over the last 150 years since Euro- American settlement? (Historic and Current Conditions)
- How might human activities alter the nearshore landscape over the next 50 years, considering a wide range of plausible policy options and land use changes? (Future Without Project Conditions)
- What are the expected ecosystem consequences of these landscape changes? (Change Analysis; Future Without Conditions)

- What types of management actions, in what geographic areas or types of ecosystems, are likely to have the greatest effect? (Alternative Futures)

Historic Conditions Report

The Historic Conditions report will provide a spatially-explicit, comprehensive assessment of the natural habitat conditions in Puget Sound estuaries and on the shoreline of Puget Sound. The Historical Conditions report will focus on the physical condition, based upon records, notes, field journals, sketches, and cartography from the Government Land Office and the U.S. Coastal and Geological Survey collected in the 1870s and 1880s. The information will be digitized and made accessible through the University of Washington. To the extent available, data will also be compiled on the historic chemical and biological condition of the Puget Sound Nearshore, but is not expected to be either comprehensive or spatially explicit. These data will be combined to develop a description of the character of nearshore ecosystem processes and resulting structures prior to European settlement of the region. It is recognized that the comprehensive historic data sets described above will need to be enriched with data from other time periods to provide additional “data points” to better trends in natural habitat conditions. Thus, portions of our analysis will be comprehensive but relatively “coarse” in scale, while other selected areas will have finer resolution (i.e. several points of analysis).

Major Tasks:

Task	Responsible Program Element	Status
Develop a Scope of Work for characterizing historic physical conditions	Nearshore Science Team	Not started
Endorse the Scope of Work	Steering Committee	Not started
Solicit interested parties to fulfill the scope	Project Management Team	Not started
Review; endorse report	Steering Committee	Not started
Develop presentation and summary versions	Communication Sub-Committee	Not started
Identify potential data sources related to historic chemical, biological, and socio-economic conditions	Nearshore Science Team	Not started
Develop approach for acquiring historic chemical, biological, and socio-economic conditions information	Nearshore Science Team	Not started

Current Conditions Report

The current conditions report will provide a spatially-explicit, comprehensive assessment of the current conditions (physical, biological) in Puget Sound estuaries and on the shoreline of Puget Sound. The analysis will be based upon selected existing data sets related to the physical and biological condition of the Puget Sound Nearshore. Where relevant, less comprehensive data on biological and socio-economic conditions of Puget Sound nearshore ecosystems will also be compiled. The analysis will utilize the Typology to relate observed shoreforms to underlying ecosystem processes.

In addition, the Current Conditions Report will incorporate new data developed through the Strategic Science Plan, such as LiDAR, and other existing inventories and assessments.

Major Tasks:

Task	Responsible Program Element	Status
Review, evaluate assessment methodologies	Implementation Team	In-progress
Identify existing priority data sets	Nearshore Science Team	Not started
Develop an “Inventory of Inventories”	Implementation Team	Not started
Establish protocols for integrating inventories and assessments	Implementation Team	Not started
Establish geo-spatial framework	Data Management Sub-Committee, Nearshore Science Team	Not started
Develop a Scope of Work for characterizing current physical conditions	Nearshore Science Team	Not started
Endorse the Scope of Work	Steering Committee	Not started
Solicit interested parties to fulfill the scope	Project Management Team	Not started
Review; endorse report	Steering Committee	Not started
Develop presentation and summary versions	Communication Sub-Committee	Not started

Change Analysis

The change analysis will assess the rate of change between historic and current conditions for physical, biological, chemical, and socio-economic conditions. This will be used to establish a trajectory of change in nearshore ecosystems as influenced by structure and process. The analysis will provide an understanding of the types of factors that have altered and constrained the natural processes in Puget Sound, and identify the effects on valued ecosystem components.

Major Tasks:

Task	Responsible Program Element	Status
Review methods for measuring change	Nearshore Science Team	In-progress
Establish methods for analyzing change	Nearshore Science Team	In-progress
Identify types of “altering factors”	Implementation Team; Nearshore Science Team	Not started
Select planning unit to conduct pilot	Project Management Team; Nearshore Science Team	Complete
Conduct pilot conditions analysis project	Nearshore Science Team	Not started
Modify methods based on pilot project results	Nearshore Science Team	Not started
Develop a Scope of Work for change analysis	Nearshore Science Team	Not started

Endorse the Scope of Work	Steering Committee	Not started
Solicit interested parties to fulfill the scope	Project Management Science Team	Not started
Review; endorse report	Steering Committee	Not started
Develop presentation and summary version	Communication Sub-Committee	Not started

Scaled Needs Assessment

The Needs Assessment will use results of the Conditions Analysis to develop a comprehensive analysis of the distribution of restoration needs and potential actions at discrete geospatial sections (i.e. planning units) within the Puget Sound Nearshore. This will be based principally on the results of Change Analysis on spatially explicit, comprehensive data, but other, more dispersed data (e.g., chemical, socioeconomic) may also be considered. The product will be a planning document that is spatially explicit which that begins to match priority “altering factors” with potential actions at nested geospatial scales. This will be the basis for identifying restoration priorities for various scales of spatial analysis (i.e. “reaches” to sub-basins).

Major Tasks:

Task	Responsible Program Element	Status
Develop method to apply Conditions Analysis results to scaled planning units	Nearshore Science Team	Not started
Develop spatially explicit description of effected ecosystem processes	Nearshore Science Team	Not started
Identify priority-altering factors by planning unit	Nearshore Science Team	Not started
Identify priority corrective actions	Implementation Team	Not started
Relate benefits of potential corrective action to VEC’s	Nearshore Science Team/ Implementation Team	Not started

Future Without Restoration Project Report

The Future Without Project Report includes the “no action” alternative that is required to be considered by the Federal regulations implementing the National Environmental Policy Act of 1969 (NEPA).

The Future Without Project Report will establish trajectories for future change for the Puget Sound Nearshore based upon the Conditions Analysis under different scenarios.

Major Tasks:

Task	Responsible Program Element	Status
Establish trajectories of change	Nearshore Science Team, Alternative Futures Workgroup	Not started
Predict effects on VECs	Alternative Futures Workgroup	Not started

Select scenario “variables”/assumptions	Steering Committee	Not started
Develop map-based scenarios	Nearshore Science Team, Alternative Futures Workgroup	Not started

Identify Management Measures

Through an evaluation of restoration literature and an examination of other ecosystem restoration programs in comparable nearshore ecosystem settings, we will develop a list “management measures,” or categories of restoration actions that may be applicable in Puget Sound.

Hypothesized links between management measures and specific nearshore processes will be described. In doing so, we will build a list of potential prescriptive measures to evaluate where need for corrective action has been identified.

Major Tasks:

Task	Responsible Program Element	Status
Develop a list of potential management measures	Implementation Team	In-progress
Use Conceptual Model to propose links between measure and ecosystem process	Nearshore Science Team/Implementation Team	Not started
Develop a programmatic description of management measures, including typical costs from on-the-ground examples	Implementation Team	Not started

Demonstration Projects

We describe Demonstration Projects as those actions with PSNERP involvement that serve our Program needs by providing learning experiences.

These actions would be identified and implemented prior to a June 2006 Interim Feasibility Report, and be undertaken with sources of funding not derived primarily from PSNERP.

Such actions would need to be consistent with the GEPs (e.g. process-based), and address critical information needs on behalf of PSNERP (e.g. hypothesized link between a management measure and an ecosystem process and/or VEC).

It is anticipated that this information need will be best addressed if Demonstration Projects are established as adaptive management experiments, with clearly stated hypotheses, and monitoring plans specifically developed to evaluate hypotheses.

Develop Project Lists

The Implementation Team will begin to develop a list of potential projects. As results for specific geographic areas from the Scaled Needs Assessment become available, we can begin to compare opportunities with identified needs, highlighting those projects that provide the best match for further analysis.

Major Tasks:

Task	Responsible Program Element	Status
Develop data base for managing list of potential projects for evaluation by PSNERP	Implementation Team	In-progress
Populate potential project list data base with input from restoration community	Implementation Team	Not started
Develop projects which meet identified strategic restoration needs	Nearshore Science Team	Not started
Evaluate projects for ability to address identified restoration needs	Implementation Team, Nearshore Science Team	Not started

Early Action Projects

Integral to a June 2006, Interim Feasibility Report will be a list of PSNERP Early Action Projects. It is anticipated that we would seek direct funding support to implement these projects.

Early Action Projects would also be consistent with the GEPs, but would also be informed by the Strategic Needs Assessment that will be a core element of the Interim Feasibility Report.

Early Action Projects would fall into one of three categories:

- **Proof of Concept** – Projects intended to evaluate the hypothesized link between management measure and ecosystem process.
- **Urgent and Obvious** – Large-scale restoration actions that address critical restoration needs (as identified by the Strategic Needs Assessment), and are largely "ready to go."
- **Priority Research** – Tasks or projects identified in the Strategic Science Plan that provide information essential to development of a Strategic Restoration Plan.

Major Tasks:

Task	Responsible Program Element	Status
Identify priority information needs, which can be addressed by Demonstration or Early Action Projects	Nearshore Science Team	In-progress
Seek funding to implement priority projects	Project Management Team	Not started

Interim Feasibility Report for General Investigation

Stage II will conclude in June 2006, with release of an Interim Feasibility Report. This report will make available Stage II work products. This will allow for restoration actions continuing with existing funding sources to proceed with the benefit of our improved understanding of

broad process restoration needs at small to medium spatial scales. It is anticipated that this interim report will contain the following:

- Results of the Strategic Needs Assessment
- Description of Management Measures appropriate at small to medium scales
- Demonstration Project List
- Identification of data gaps regarding restoration of processes at larger spatial scales

STAGE III: Spring 2006 thru Fall 2007

Overview

During Stage III, we will employ the strategic needs assessment (“what is broken and where”) and analyses developed under Stage II in the formulation of a comprehensive Puget Sound wide restoration plan that addresses needs beyond the capacity of local partners under existing programs. However, the assessment and analyses will also provide continuing guidance and understanding to these partners.

The Stage II technical products are essential in development of quantified restoration objectives that are an expression of social preference in “how much” restoration is desired. By using alternative future scenario modeling, we will present the anticipated outcome of various restoration strategies, providing as much detail as possible about the ecosystem benefits and associated costs with strategies such as –

- No restoration actions (future without condition)
- Minimal restoration actions, or little increase in on-going effort
- Maximum implementation of process based restoration and
- Intermediate scenarios, as appropriate

As Stage III proceeds, detailed restoration plans and designs will be formulated and evaluated leading to larger scale restoration projects that may need new congressional authorization.

Restoration Plan Formulation

Desired future with project conditions

To project a future with project condition, PSNERP will need to conduct a futures analysis, or identify different visions or scenarios (alternatives) of the future building on efforts begun with the identification of the future without project condition completed in Stage II.

In Stage III we will develop two or more alternative “visions” or scenarios for the future landscape with project that reflect varying assumptions about land and water use, and then compare these to the future without project condition to identify the change between each scenario and the likely future if no action is taken.

The likely effects of these futures are expressed in some gain or loss in valued ecosystem components – either ecological or socio-economic. The completion of the analysis will be dependent on development of various nearshore restoration portfolios.

Restoration objectives

Restoration objectives are specific, measurable actions to meet the goals established in Stage I. We will establish quantifiable objectives to meet strategic needs for spatially explicit portions of Puget Sound based on a desired future condition for VECs. Restoration actions, which will focus on restoration of nearshore ecosystem processes, will be linked to objectives which quantify a desire for improvement in the condition of biological resources, including VEC's.

The objectives will be met through development of restoration portfolios, a series of projects or actions for a specific portion of the Puget Sound Nearshore.

Nearshore Restoration Portfolio

As part of Stage III, we anticipate development of a list of strategic, process-based, ecosystem scale restoration actions. These actions are organized as portfolios, or a series or grouping of different action types for a particular portion of the Puget Sound Nearshore.

Portfolios will be developed in response to the Strategic Needs Assessment (what needs to be done where) and the Restoration Objectives (how much needs to be done). The Nearshore Portfolio is considered to include both large-scale restoration actions requiring significant new federal assistance (GI Portfolio or top-down planning) and smaller scale actions that would be implemented at local or community scales (bottom-up) of action.

General Investigation Portfolio

We will analyze different combinations of “portfolios” of spatially explicit large-scale restoration actions from a broad list of potential actions. These large-scale actions are likely to require federal assistance and will be evaluated through the Corps plan formulation process with analysis and reporting in the Final Feasibility Report.

In addition to large-scale restoration actions, the GI study process provides the opportunity to study and recommend other actions outside restoration, including protection of nearshore areas or changes in shoreline management, although these actions may not reside in and will be independent of the GI portfolio.

It is anticipated that the GI Portfolio List will be an iterative process, and that future actions will become more specific as the results of already implemented demonstration projects emerge. Preferred alternative portfolios will then be used to project the “Future with Project” condition, and the incremental benefits of the project evaluated.

Additional Restoration and Management Actions

The list of large-scale actions to be completed with federal assistance will be designed to interact in a complementary and synergistic manner with projects being implemented or anticipated at more local scales of action. It is anticipated that PSNERP will bring added value to locally implemented actions by providing an identification of restoration priorities, and by assuming

responsibility for large scale actions necessary to restore ecosystem processes essential to local projects.

Additional actions may include recommendations from the GI Portfolio that cannot be implemented under federal authorities such as protection of nearshore areas and modification of shoreline management plans and regulations affecting watershed development.

Adaptive Management and Monitoring

A hallmark of national ecosystem programs, euphemistically called - science-based decision support systems - incorporates long-term monitoring, adaptive management projects, monitoring and ecological modeling to continually improve information and scientific knowledge regarding restoration actions, and the restoration decisions that are based on scientific understanding. A 50-year adaptive management, and a monitoring and modeling plan will be developed as a stand-alone report for the feasibility study.

Final Feasibility Report for General Investigation

The Final Feasibility Report will describe our attempt to develop a complete, cost-effective, environmentally sound, technically feasible, socially acceptable solution to declining Puget Sound ecosystem conditions.

The document will tell the story of the Nearshore Project teams' efforts to engage experts and the public in planning a large-scale ecosystem restoration project. Early efforts at restoration, while showing that the ecosystem initially, rapidly responds with encouraging resilience, demonstrate that degraded natural processes commonly overwhelm initial resilience because the processes operate on a larger scale than the restoration actions.

A plan that identifies large-scale natural processes as the link to physical and biological conditions, fundamental sources of ecosystem decline, and to restorative actions –while encouraging wide-spread, influential citizen participation-- is needed as the next-generation for ecosystem restoration programs within the Puget Sound.