

Guiding Principles for Restoration Projects in Puget Sound

The Nearshore Science Team of the Puget Sound Nearshore Partnership has crafted a set of **guiding restoration principles** and **fundamental ecological concepts and assumptions** to assist in the development of an effective, large-scale ecosystem restoration program for the Puget Sound nearshore.

These principles communicate the Nearshore Partnership's understanding of nearshore ecosystems and provide a framework for identifying, evaluating and implementing restoration and protection actions. The principles apply to all stages of a project — from early planning to post-implementation monitoring. As such, they are useful to a variety of individuals and organizations involved in restoration and protection of nearshore ecosystems and habitats.

*This fact sheet briefly summarizes key principles, concepts and assumptions. A more detailed discussion is contained in **Guiding Restoration Principles (Technical Report 2004-03)** by Fred Goetz, Curtis Tanner and Charles Simenstad, available online in a downloadable (pdf) format at www.pugetsoundnearshore.org/material_activity.html#documents.*

Strategic Principles

The first set of guiding restoration principles defines an overarching strategy for restoration program development:

- Programs should focus on restoration of natural processes that create and maintain nearshore ecosystem structure and function.
- Program efforts should promote protection of nearshore habitats and the processes that sustain them.
- Outreach and education activities should be incorporated into all parts of the program.
- Program efforts must include social, cultural and economic values at multiple scales in time and space.

Restoration Design Principles

These principles promote a strategic approach to restoration design, which begins with careful design at program and project levels:

- Restoration actions should be based on explicitly stated hypotheses.
- Initial restoration projects should be designed as experiments to address information needs.
- Project implementation should be preceded by restoration planning.
- Restoration must consider “ecological succession.”
- Project proponents should recognize the limits on ecosystem potential constrained or limited by irreversible change.
- Restoration projects should be based on carefully developed goals and objectives.



Project Follow-Through

The success of restoration actions is often determined not only by clear planning and good implementation, but by the commitment of project sponsors to post-construction follow-through:

- Project objectives should be used to build performance standards and implement a monitoring program that evaluates attributes directly related to these standards and the objectives they assess.
- Adaptive management should be employed in project development and in revising program goals and objectives.
- Project proponents should take advantage of best interdisciplinary science and technical knowledge and employ a scientific, peer-review process.
- Analysis of ecosystem processes requires that data represent the spatial and temporal dynamics at various scales as well as being well documented and well defined.

Adaptive Management Principles

Through adaptive management, research and monitoring are used to allow certain projects and activities to proceed despite uncertainty and risk regarding their consequences. The overall intent of this process is to reduce the risk and uncertainty associated with future actions and to increase knowledge about nearshore ecosystems.

- Adaptive management is employed to develop projects and to shape the restoration program's goals and objectives.
- Adaptive management is best suited to large-scale applications.
- All restoration actions should be viewed, implemented and monitored as a means to test a hypothesis or answer a question posed by a conceptual model of expected project response.
- An adaptive management approach is preferred where data are available at multiple steps and are used to structure a range of alternative response models.
- Environmental thresholds or triggers are essential in adaptive management.
- If uncertainties about causal relationships exist, it is best to use the Precautionary Principle — that if the consequences of an action are unknown, but are judged to have some potential for major or irreversible negative consequences, then it is better to avoid that action.
- Adaptive management requires the participation of science, monitoring and management institutions, as well as the flexibility to take corrective measures and change an approach based on lessons learned.

Photo, opposite side: Spencer Spit on Lopez Island, Washington, is an example of a back-barrier lagoon. Courtesy of Hugh Shipman, Washington Department of Ecology.

Monitoring Principles

The intent of a monitoring program is to provide consistent direction in development of monitoring plans for restoration projects:

- Project objectives should be used to build performance criteria and implement a monitoring plan that evaluates attributes directly related to these criteria and the objectives they assess.
- Restoration actions should test hypotheses or answer specific questions about ecosystem functions and processes and human interventions.
- Monitoring should determine whether restoration goals and objectives are being met.
- Monitoring must be considered part of an information feedback system called adaptive management that leads to increased knowledge, which in turn reduces uncertainty in decision-making and in the outcomes of restoration.
- Monitoring must be a long-term effort and should be interdisciplinary in approach.
- Monitoring should occur at multiple scales in time and space; selected indicators are defined by objectives and scaled appropriately.
- Monitoring must be inter-institutional, owing to the complex nature of societal management of lands and natural resources.

The Puget Sound Nearshore Partnership is a large-scale initiative that affords unique opportunities to address some of the foremost habitat restoration needs in Washington State's Puget Sound basin. Partners include the U.S. Army Corps of Engineers, Washington Department of Fish and Wildlife, other federal and state government organizations, tribes, industries and environmental groups. Nearshore Partnership goals are to identify significant ecosystem problems, evaluate potential solutions, and restore and preserve critical nearshore habitat, including bluffs, beaches, shorelines, mudflats, salt marshes, gravel spits and estuaries.

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ECOSYSTEM HEALTH**

For more information, please visit the Nearshore Partnership web site: www.pugetsoundnearshore.org

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