City of Edmonds
Shoreline Master Program

Restoration Plan

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Introduction

This restoration plan has been prepared in accordance with the Washington State Department of Ecology (Ecology) *Shoreline Master Program Guidelines* (*Guidelines*). The *Guidelines* direct local government review and updates of shoreline master programs (SMPs). A significant feature of the *Guidelines* is the requirement that local governments include within their SMPs a "real and meaningful" strategy to address restoration of shorelines (WAC 173-26-186(8)). The *Guidelines* emphasize that any *development must achieve no net loss of ecological functions*. The *Guidelines* go on to require a *goal of using restoration to improve the overall condition of habitat and resources* and make "planning for and fostering restoration" an obligation of local government. From WAC 173-26-201(2)(c):

> Master programs shall also include policies that promote restoration of ecological functions, as provided in WAC 173-26-201(2)(f), where such functions are found to have been impaired based on analysis described in WAC 173-26-201(3)(d)(i). It is intended that local government, through the master program, along with other regulatory and non-regulatory programs, contribute to restoration by planning for and fostering restoration and that such restoration occur through a combination of public and private programs and actions. Local government should identify restoration opportunities through the shoreline inventory process and authorize, coordinate and facilitate appropriate publicly and privately initiated restoration projects within their master programs. **The goal of this effort is master programs which include planning elements that, when implemented, serve to improve the overall condition of habitat and resources within the shoreline area of each city and county**. [Emphasis added]

WAC 173-26-2012(f) states further that "…master programs provisions should be designed to achieve overall improvements in shoreline ecological functions over time when compared to the status upon adoption of the master program." For guidance on preparation of a Restoration Plan, the City of Edmonds (City) looked to WAC 173-26-186, WAC 173-26-201(2)(c) and (f) and *Restoration Planning and the 2003 Shoreline Management Guidelines*, an Ecology report, as well as *Systematic Approach to Coastal Ecosystem Restoration*, developed by the National Oceanic and Atmospheric Administration (NOAA) (Diefenderfer 2003), in addition to other resources listed at the end of this chapter. Restoration planning should be focused on tools such as economic incentives, broad funding sources such as Salmon Restoration Funding and Water Resource Inventory Area (WRIA) habitat restoration programs, volunteer programs, and other strategies. Furthermore, because restoration planning must reflect the individual conditions of a shoreline, restoration planning provisions contained in the *Guidelines* expressly note that a restoration plan will vary based on:

- Size of jurisdiction
- Extent and condition of shorelines
- Availability of grants, volunteer programs, other tools
- The nature of the ecological functions to be addressed

Restoration Planning Requirements

The *Guidelines* (WAC 173-26-201(2)(f)) state that SMP restoration plans shall consider and address the following subjects:

i. Identify degraded areas, impaired ecological functions, and sites with potential for restoration;

ii. Establish overall goals and priorities for restoration of degraded areas and impaired ecological functions;

iii. Identify existing and ongoing projects and programs that are currently being implemented, or are reasonably assured of being implemented (based on an evaluation of funding likely in the foreseeable future), which are designed to contribute to local restoration goals;

iv. Identify additional projects and programs needed to achieve local restoration goals, and implementation strategies including identifying prospective funding sources for those projects and programs;

v. Identify timelines and benchmarks for implementing restoration projects and programs and achieving local restoration goals;

vi. Provide for mechanisms or strategies to ensure that restoration projects and programs will be implemented according to plans and to appropriately review the effectiveness of the projects and programs in meeting the overall restoration goals.

These requirements are intended to provide the framework to restore impacted, altered or missing ecological functions resulting from past development of the shoreline. Restoration planning is not intended to directly mitigate past or future development impacts on the City's shorelines. Restoration is intended to improve overall environmental conditions unrelated to upcoming projects planned in the shoreline environment. Nonetheless, restoration projects may leverage opportunities that result from development, and restoration planning needs be aware of projects and programs so as to not duplicate efforts or potentially waste valuable resources.

Definition of Restoration

The term *restoration* has a number of definitions, all of which share similar ideas. They often refer to the return of an area to a previous condition by improving the biological structure and function (Diefenderfer 2003). Examples of definitions of restoration put forth by various authors and agencies include: bringing back a former, normal, or unimpaired state; a return to a previously existing natural condition; reestablishing vegetation; and returning a damaged ecosystem to its pre-disturbed state. The *Guidelines* state that:

> "Restore," "restoration," or "ecological restoration" means the reestablishment or upgrading of impaired ecological shoreline processes or functions. This may be accomplished through measures including but not limited to revegetation, removal of intrusive shoreline structures and removal or treatment of toxic materials. Restoration does not imply a requirement for returning the shoreline area to aboriginal or pre-European settlement conditions.

The Society of Wetland Scientists (2000) defines wetland restoration, which is similar to shoreline restoration, as actions taken in a converted or degraded natural wetland (read "shoreline") that result in the reestablishment of ecological processes, functions, and biotic/abiotic linkages and lead to a persistent, resilient system integrated within its landscape. In an effort to be clear and consistent in the discussion of restoration, five key elements of the concept of restoration are adopted from the Society of Wetland Scientists:

1. Restoration is the reinstatement of driving ecological processes.

2. Restoration should be integrated with the surrounding landscape.

3. The goal of restoration is a persistent, resilient system.

4. Restoration should generally result in movement toward the historic (pre-contact) type of environment but may not always result in the historic biological community and structure.

5. Restoration planning should include the development of structural and functional objectives and performance standards for measuring achievement of the objectives.

In this SMP, restoration is used broadly to include conservation and enhancement actions. Conservation is different from restoration as described above in that it protects areas relatively free of degradation. Enhancement, which improves shoreline functions, but may not result in restoration of underlying process, may be more viable than restoration in some instances.

Restoration Approach

A systematic approach to restoration planning, implementation, and monitoring increases the accessibility of the plan and increases the long-term usability of the restoration framework. The five components of a systematic approach to a restoration project are planning, implementation, performance assessment, adaptive management, and dissemination of results (Diefenderfer 2003).

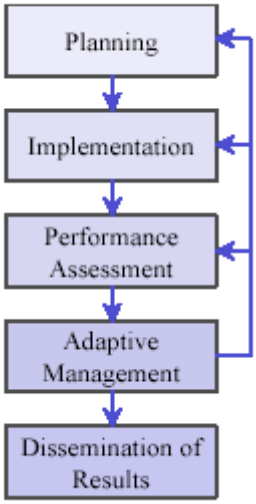


Figure 1. Five components of a coastal restoration project (Diefenderfer 2003)

NOAA's *Systematic Approach to Coastal Ecosystem Restoration* is a usable guidance tool for each of these five components and states:

> "The planning process starts with a vision, a description of the ecosystem and landscape, and goals. A conceptual model and planning objectives are developed, a site is selected, and numerical models contribute to preliminary designs as needed. Performance criteria and reference sites are selected and the monitoring program is designed. Cost analysis involves budgeting, scheduling, and financing. Finally, documentation is peer reviewed prior to making construction plans and final costing" (Diefenderfer 2003).

This restoration plan should be considered within this overall framework. The restoration chapter is designed to meet the requirements for restoration planning outlined in the *Guidelines*, in which restoration planning is an integrated component of SMPs that include inventorying shoreline conditions and regulation of shoreline development. The restoration plan builds on the *City of Edmonds Shoreline Master Program Update Draft Shoreline Inventory and Characterization* (*Shoreline Inventory and Characterization*) report (Sea-Run Consulting et al. 2006), which provides a comprehensive inventory and analysis of shoreline conditions in Edmonds, including rating specific functions and processes of each shoreline segment. The *Shoreline Inventory and Characterization* report documents baseline environmental conditions in the City's shoreline jurisdiction.

This restoration plan provides a vision for ecological restoration, and includes goals, policies, objectives, and opportunities. It also establishes strategies for implementation, including recognition of existing and ongoing programs, and it provides a framework for long-term monitoring of shoreline restoration and shoreline conditions. While this restoration plan includes broad objectives, specific implementation measures, budgets, schedules, and individual monitoring programs will be needed for individual restoration projects as they occur.

To ensure that restoration goals are being achieved, it is important for the City to evaluate the performance effectiveness of this plan and to adapt to changing conditions. At a minimum, this restoration plan (as well as the entire SMP) will be reevaluated according to the schedule adopted by the state Legislature. The City will conduct reevaluation of the success of the SMP and its restoration goals consistent with the comprehensive plan update schedule. At times of reevaluation, the inventory conditions and restoration metrics will be considered in comparison to the 2002-2006 conditions reviewed for this SMP. Updates to inventory information and the results of reevaluation processes will be disseminated to other restoration planning agencies to facilitate regional monitoring of environmental conditions.

Adaptive management is the process of continually improving management policies and practices to respond to results. Shoreline planning and restoration is an iterative process. As data are gathered and compared to past years' data, one will be able to come to a clearer understanding of environmental processes and stressors. As understanding increases, the City will have the opportunity to adjust policies, regulations and restoration priorities to adapt to changes in conditions and information. At a minimum, the City will take corrective actions if the mandate of no net loss of shoreline ecological resources is not being met.

Restoration Vision Statement

The vision statement establishes the overarching idea of the future restored ecosystem and provides a basis for the framework, including the restoration goals and objectives. This vision statement seeks to make clear the intent of addressing ecological restoration:

- The Edmonds shoreline landscape and the ecosystem that makes use of the coastal habitat are community assets to be restored, protected, and preserved for the common good.
- The Edmonds shoreline ecosystem is an integral part of the Puget Sound ecosystem and should be managed in concert with the ecosystem goals in the Puget Sound Management Plan (Puget Sound Water Quality Action Team 2001).
- All citizens are entitled to ready access to waters whose condition support high quality recreation and high quality habitat providing for a diverse population of marine life.
- Puget Sound is an important resource that supports a variety of economic activities from tourism to navigation to commercial fishing.
- The restoration plan seeks to maintain and protect existing functions and processes of the Edmonds shoreline ecosystem, where possible.
- The restoration plan looks for opportunities to restore and enhance functions and processes of the Edmonds shoreline ecosystem, where possible.

- The restoration plan seeks to evaluate potential restoration projects on best available science.
- The restoration plan adopts an adaptive management approach to implementation, funding, and evaluation.

Restoration Goals, Policies, and Objectives

For restoration, the City's SMP identifies three goals for restoring the Edmonds shoreline:

1. Improve water quality.

2. Restore degraded and lost habitat and corridors to improve ecological functions.

3. Improve connectivity of the shoreline environments in terms of both space and time.

The SMP also identifies 13 polices for restoring the Edmonds shoreline:

1. Protect and/or restore freshwater, nearshore, and estuarine habitat and habitat-forming processes.

2. Protect and restore wetland and restore salt marsh habitat to improve shoreline ecological functions.

3. Remove intertidal fill; restore beach deposits and processes and ecological functions.

4. Remove/replace creosote-treated logs, pilings, and debris.

5. Increase availability of large woody debris and opportunities for recruitment in the nearshore zone.

6. Protect and restore native species of vegetation, fish, and wildlife.

7. Remove or improve fish- and wildlife-passage barriers.

8. Manage and treat stormwater to improve water quality, decrease peak flow events, and increase implementation of low impact development (LID) practices.

9. Protect naturally eroding bluffs and associated ecological functions.

10. Protect and restore wildlife corridors.

11. Ensure that shoreline restoration projects do not degrade critical areas and water quality.

12. Establish incentives that could provide opportunities for new development to restore impaired shoreline ecological functions.

13. Work with the Burlington Northern Santa Fe Railway to encourage nearshore restoration projects on the railroad right-of-way.

While these goals and policies identify the direction of needed improvements, objectives identify specific actions—ideally measurable—that can be taken to achieve the stated goals. For example, to meet the goal of improving water quality, an objective would be to remove creosote pilings. Objectives that meet the restoration goals and policies of the SMP are listed in Table 1. These objectives assist with defining actions or projects to restore the natural processes and ecological functions identified in the *Shoreline Inventory and Characterization* as not properly functioning.

Later in this document, opportunities and strategies are identified as possible means of implementing the objectives. At this level, no measurable performance standards are applied to goals. For example, the overall goal is to improve water quality to meet the vision of a restored ecosystem, not to improve it by "X" amount. Individual restoration projects that may be implemented as part of this plan are expected to include specific measurable goals.

The goals and objectives included here are developed for the Edmonds shoreline and are consistent with the recommendations in guidance from the Puget Sound Nearshore Partnership (Fresh et al. 2004, Goetz et al. 2004), as well as that for nearshore habitats in the *Final Lake Washington/Cedar/Sammamish Watershed (WRIA 8) Chinook Salmon Conservation Plan* (WRIA 8 Steering Committee 2005), which includes Edmonds.

Table 1 shows the relationships of the goals, objectives, natural processes and ecological functions. The first column shows the goals, the second column shows the objectives associated with those goals and the third column shows the natural process and ecological function that will be enhanced by completing the objectives. Objectives are found under multiple goals affecting different natural processes and ecological functions. Potential metrics for monitoring each objective are listed in the right hand column.

Table 1: Restoration Goals and Objectives			
Restoration Goal	**Objective**	**Natural Process** *Ecological Function*	**Potential Metrics**
Improve water quality	Remove/replace unused creosote pilings; remove creosote beach logs	**Sediment Transport** *Toxic compound removal* *Vegetation support*	# creosote pilings Water and sediment quality measurements
	Protect and restore wetlands and salt marsh habitat	**Hydrologic Processes** **Sediment Transport** **Nutrients** *Water storage* *Sediment storage* *Toxic compound removal* *Nutrient removal*	Wetland acreage Wetland functions Wetland ratings Water quality measurements
	Manage and treat stormwater and wastewater properly	**Hydrologic Processes** **Sediment Transport** **Nutrients** *Water storage* *Sediment storage* *Toxic compound removal* *Nutrient removal*	Water quality measurements Storm flows
	Protect and restore native vegetation	**Hydrologic Processes** **Nutrients** *Water storage* *Sediment storage* *Nutrient removal* *Toxic compound removal*	% Impervious surface in basin Acreage of vegetation Extent of invasive species Water quality measurements
	Remove intertidal fill	**Sediment Transport** *Water storage* *Sediment storage* *Nutrient removal*	Acreage or number of restored/remaining impaired areas

Table 1: Restoration Goals and Objectives			
Restoration Goal	**Objective**	**Natural Process** *Ecological Function*	**Potential Metrics**
Restore degraded and lost habitat and corridors to improve ecological functions Improve connectivity of the shoreline environments in terms of both space and time	Protect and restore native vegetation	**Hydrologic Processes** **Sediment Transport** **Vegetation** **Nutrients** **Habitat** *Support vegetation* *Woody debris recruitment* *Organic material availability* *Rearing habitat* *Resting habitat* *Predation avoidance habitat* *Migration corridors* *Food production* *Food delivery*	Acreage of vegetation by type (riparian, eelgrass, kelp) Degree of diversity Species supported Connectivity/areas of isolation Extent of tree canopy Linear feet of bulkhead Extent of invasive species
	Protect and restore wetlands salt marsh habitat, and estuarine and lagoon functions	**Hydrologic Processes** **Sediment Transport** **Vegetation** **Nutrients** **Habitat** *Support vegetation* *Woody debris recruitment* *Organic material availability* *Rearing habitat* *Resting habitat* *Predation avoidance habitat* *Osmoregulatory adjustment* *Migration corridors* *Food production* *Food delivery*	Wetland acreage Wetland functions Wetland ratings Connectivity/areas of isolation

Table 1: Restoration Goals and Objectives			
Restoration Goal	**Objective**	**Natural Process** *Ecological Function*	**Potential Metrics**
	Protect naturally eroding bluffs, sand spits and accretion land forms	**Sediment Transport** **Vegetation** **Habitat** *Support vegetation* *Woody debris recruitment* *Organic material availability* *Beach habitat* *Predation avoidance habitat* *Migration corridors*	Linear feet of active feeder bluff Rate of sediment delivery to beach Acreage of vegetation in bluff areas Linear feet of bulkhead
	Remove intertidal fill/restore beach deposits and processes	**Sediment Transport** **Vegetation** **Nutrients** **Habitat** *Support vegetation* *Woody debris recruitment* *Organic material availability* *Rearing habitat* *Resting habitat* *Predation avoidance habitat* *Migration corridors* *Food production* *Food delivery*	Acreage or number of restored/remaining impaired areas Linear feet of bulkhead Number of stream mouth migration barriers removed Shoreline connectivity/areas of interruption
	Manage and treat stormwater and wastewater properly	**Hydrologic Processes** **Sediment Transport** **Nutrients** *Water storage* *Sediment storage* *Toxic compound removal* *Nutrient removal*	Water quality measurements Storm flows

Restoration Opportunities

This restoration plan recognizes that the Edmonds shorelines are highly altered and retain few elements that are fully functioning through natural processes. The Edmonds shoreline of Lake Ballinger is fully developed with single-family housing, yards, and docks. The Puget Sound shoreline in the City does retain large areas of functioning eelgrass and kelp beds in the littoral zone (lower intertidal to shallow subtidal elevations). Overall, however, the middle to upper intertidal zone is modified by the presence of the Burlington Northern Santa Fe (BNSF) railroad, the Port of Edmonds, the Washington State Ferries terminal, and the former Union Oil dock. The Edmonds Marsh is impacted and constrained by the former Union Oil development, the BNSF railroad, Harbor Square, and State Route 104. Preservation is the first priority for achieving no net loss of existing eelgrass or kelp bed function. In addition, limited opportunities for restoration of other littoral habitats do exist and, given the currently degraded nature of the City's shorelines, there is a high potential that the restoration goal of increasing shoreline habitat function can be met.

Table 2 lists specific opportunities for each shoreline segment that have been identified in the *Shoreline Inventory and Characterization* and others that have been provided through other sources (some of these opportunities are shown geographically in Figure 13 of the *Shoreline Inventory and Characterization*). These are opportunities for restoration that correspond to the restoration goals, policies and objectives.

Opportunities, listed by shoreline segment, are in the left-hand column. The second column lists the related restoration objectives. Identified restoration activities and monitoring activities, where known, are listed in the third and fourth columns, respectively. The fifth column indicates whether funding for the restoration opportunity has been secured. The sixth column provides a preliminary timeline for when work related to the restoration opportunity might take place. "Indeterminate" means that the timeline for the restoration opportunity—if work related to the opportunity occurs at all—is dependent upon other factors, and is therefore difficult to predict. "Long-term" signifies that no action plan is currently in place for a given restoration opportunity. Finally, in accordance with the *Guidelines*, the sixth column indicates the preliminary priority of restoration opportunities. Opportunities are designated as "high," "medium," or "low" priority. Restoration opportunities that are currently funded were designated as "high" priority. Restoration opportunities that would either meet three or more of restoration element policies, or may receive funding were designated as "medium" priority. Restoration opportunities that would either meet two or fewer restoration element policies or have no current prospect of future funding were designated as "low" priority.

Regarding opportunity prioritization, controlling environmental factors (such as hydrology, water quality, sediment type, etc.) provide the foundation for habitat structures (i.e., species and their abundance), and the structure supports habitat functions (i.e., production, food support, rearing, etc.)(Thom 2003). That is, restoration of habitat functions may be ineffective if habitat structures and controlling factors are not also restored. Thom (2003) states: "There is no universally accepted method for setting priorities for nearshore sites for restoration or for determining what strategies are best applied to each site. We have found that restoration of controlling factors is the key to successful and long-term restoration."

So, overall priority should be given to protection and restoration of natural processes that are needed to support ecosystem and habitat functions. However, where restoration of those processes is not currently feasible (e.g., sediment supply interruption by the railroad right-of-way and bulkhead), non-natural measures may be taken to enhance ecological function on a non-self sustaining basis (e.g., by artificial addition of sediments into a coastal drift cell).

Table 2 is an extensive list that likely exceeds near-term funding opportunities, and yet, is not exhaustive. Additional restoration opportunities may continue to be identified through local and regional shoreline monitoring and planning actions. Further discussion of ongoing programs, implementation strategies, and project evaluation to determine appropriate priority is provided in sections following the table. As such, Table 2 is a snapshot and it is expected that actual restoration opportunities and priorities will evolve over time as restoration projects are completed and new information becomes available. The City may periodically identify additional restoration opportunities that are consistent with the objectives of this restoration chapter.

Table 2: Restoration Opportunities						
Restoration Opportunity	**Restoration Objective**	**Restoration Activity**	**Monitoring Activities**	**Funding Secured?**	**Timeline[1]**	**Priority**
Marine Shoreline						
Throughout: Enhance eelgrass	Expand eelgrass extent/productivity by establishing new plots	Restoration of eelgrass and macroalgae beds at existing ferry terminal proposed for "Edmonds Crossing" (new ferry terminal) development	Measure survival and expansion of transplanted plots	No	Indeterminate/Long-term	Medium/Low
Lunds Gulch: Replace the existing box culvert beneath the railroad with a wider box culvert (may be out of Edmonds' jurisdiction) **1***	Protect/restore nearshore and estuary habitat for enhanced coho and chum production; decrease sedimentation; improve fish passage; decrease pedestrian contact	No ongoing activity identified	Monitor fish usage	No	Long-term	Medium
Lunds Gulch: Enhance riparian vegetation (may be out of Edmonds' jurisdiction) **2***	Protect/restore stream habitat for enhanced coho production	Some planting underway by local volunteers	Monitor plant survival; control invasives	No	Long-term	Medium
Lunds Gulch: Create an off-channel pond in county park (may be out of Edmonds' jurisdiction) **3***	Protect/restore lacustrine habitat for enhanced coho production; provide high-flow refugia	No ongoing activity identified	Monitor fish usage	No	Long-term	Low

Table 2: Restoration Opportunities						
Restoration Opportunity	**Restoration Objective**	**Restoration Activity**	**Monitoring Activities**	**Funding Secured?**	**Timeline[1]**	**Priority**
Lunds Gulch: Add large woody debris (LWD) to off-channel pond (may be out of Edmonds' jurisdiction) **4***	Protect/restore lacustrine habitat for enhanced coho production	No ongoing activity identified	Monitor fish usage	No	Long-term	Low
Lunds Gulch: Enhance/restore marine riparian vegetation **5***	Protect and restore native vegetation waterward of railroad	No ongoing activity identified	Perform vegetation transects after planting (1, 3, 5, 7, and 10 years)	No	Long-term	Medium
Lunds Gulch: Conduct beach nourishment activities **6***	Restore beach deposits and processes; protect/restore nearshore habitat-forming processes	No ongoing activity identified	Monitor sediment transport and evolution of beach profile; check with aerial photos after initiating activities	No	Long-term	Low
Meadowdale Creek: Acquire and remove existing Meadowdale Marina structure **7***	Remove/replace creosote-contaminated pilings; protect/restore nearshore habitat	No ongoing activity identified	Inspect after removal; perform vegetation transects for eelgrass (1, 3, 5, 7, and 10 years)	No	Long-term	Low
Shell Creek: Conduct beach nourishment activities at the mouth of Shell Creek **8***	Restore beach deposits and processes; protect/restore nearshore habitat-forming processes	No ongoing activity identified	Monitor sediment transport and evolution of beach profile; check with aerial photos after initiating activities	No	Long-term	Low
Shell Creek: Replace railroad crossing with trestle or improved culvert **9***	Protect/restore nearshore and estuary habitat	No ongoing activity identified	Monitor fish usage	No	Long-term	Medium

Table 2: Restoration Opportunities						
Restoration Opportunity	**Restoration Objective**	**Restoration Activity**	**Monitoring Activities**	**Funding Secured?**	**Timeline[1]**	**Priority**
Underwater Park: Add more structures	Structures increase habitat diversity and serve as substrata for algal colonization	Planning by local dive groups and City Parks and Recreation Dept.	Monitor vegetation establishment and fish use of new structures	No	Long-term	Low
Bracketts Landing: Marine riparian vegetation restoration and enhancement; opportunity for public education/interpretive exhibit describing Edmonds-wide efforts **10***	Protect and restore native vegetation	No ongoing activity identified	Perform vegetation transects after planting (1, 3, 5, 7, and 10 years)	No	Long-term	Medium
Bracketts Landing: Conduct beach nourishment activities just north of jetty	Restore beach deposits and processes; protect/restore nearshore habitat-forming processes	No ongoing activity identified	Monitor sediment transport and evolution of beach profile; check with aerial photos after initiating activities	No	Long-term	Low
Existing Ferry Terminal: Removing portions of the terminal that sit atop creosote pilings	Remove/replace creosote-contaminated piling; protect/restore nearshore habitat	Proposed activity for "Edmonds Crossing" (new ferry terminal) development	Inspect after removal; perform vegetation transects for eelgrass (1, 3, 5, 7, and 10 years)	No	Indeterminate	Medium
South County Senior Center: Reconfiguration of parking lot to restore beach habitat	Restore beach deposits and processes; protect/restore nearshore habitat-forming processes	No ongoing activity identified	Monitor sediment transport and evolution of beach profile; check with aerial photos after initiating activities	No	Long-term	Medium

Table 2: Restoration Opportunities						
Restoration Opportunity	**Restoration Objective**	**Restoration Activity**	**Monitoring Activities**	**Funding Secured?**	**Timeline[1]**	**Priority**
Edmonds Marsh: Channel improvements	Protect/restore freshwater and estuarine habitat	City of Edmonds Capital Improvement Project	Monitor saltwater marsh vegetation	Yes	Inter	High
Edmonds Marsh: Culvert replacement	Protect/restore nearshore and estuary habitat	Proposed activity for "Edmonds Crossing" (new ferry terminal) development	Monitor fish usage	No	Indeterminate	Medium
Willow Creek: Restore creek to open channel **11***	Protect/restore freshwater and estuarine habitat; increase opportunities for recruitment	Proposed activity for "Edmonds Crossing" (new ferry terminal) development; culvert replacement proposed in Sound Transit JARPA mitigation plan	Monitor fish usage	No	Indeterminate	Medium
Point Edwards: Remove existing pier **12***	Remove/replace creosote-contaminated pilings; protect/restore nearshore habitat	Proposed activity for "Edmonds Crossing" (new ferry terminal) development	Inspect after removal; perform vegetation transects for eelgrass (1, 3, 5, 7, and 10 years)	No	Indeterminate	Medium

Table 2: Restoration Opportunities						
Restoration Opportunity	**Restoration Objective**	**Restoration Activity**	**Monitoring Activities**	**Funding Secured?**	**Timeline[1]**	**Priority**
Lake Shoreline						
Lake Ballinger: Control quantity and quality of runoff entering lake **13***	Manage and treat stormwater to improve water quality, decrease peak flow events, and increase implementation of low impact development (LID) practices	Ongoing implementation of the Stormwater Management Manual for Puget Sound; stormwater system improvements as street improvements are constructed	Monitor water quality (water quality is currently being monitored through a City of Edmonds Capital Improvement Project)	Partially	2015-2020/Long-term	Medium/Low
Lake Ballinger: Revise outlet control structure (may be out of Edmonds' jurisdiction) **14***	Protect/restore freshwater habitat; increase opportunities for recruitment	No ongoing activity identified	Monitor fish usage	No	Long-term	Medium

* Numbers correspond to Figure 13 of the *City of Edmonds Shoreline Master Program Update Draft Shoreline Inventory and Characterization*, which geographically identifies potential restoration projects

[1] Short-term means 1 – 5 years. Intermediate means 5 – 10 years. Long-term means more than 10 years.

Existing and Ongoing Programs

The following list of agencies and organizations with nearshore interests is by no means complete. It does, however, include those agencies and organizations that appear to have the most interest in nearshore areas and restoration in and around the City.

Snohomish County Marine Resources Committee

In 1998, passage of the Northwest Straits Marine Conservation Initiative established the Northwest Straits Commission and seven Marine Resource Committees, including the Snohomish County Marine Resource Committee (MRC). The Snohomish County MRC is a citizen-based effort to identify regional marine issues, foster community understanding and involvement, recommend positive action and develop support for various protection and restoration measures. The Snohomish County MRC works toward fulfilling the following performance standards:

a. Broad county participation in MRCs

b. A scientifically-based, regional system of Marine Protected Areas (MPAs)

c. A net gain in highly ecologically productive nearshore, intertidal and estuarine habitat in the Northwest Straits, and no significant loss of existing, high-value habitat; improvements in state, tribal, and local tools to map, assess, and protect nearshore habitat and prevent harm from upland activities

d. Net reduction in shellfish harvest areas closed due to contamination

e. Measurable increases in factors supporting recovery of bottom fish (such as rockfish)—including numbers of fish of broodstock size and age, average fish size, and abundance of prey species—as well as sufficient amounts and quality of protected habitat

f. Increases in other key marine indicator species (including those identified in the 1997 West report on Puget Sound marine resources)

g. Coordination of scientific data (for example, through the Puget Sound Ambient Monitoring Program), including scientific baseline, common protocols, unified GIS, and sharing of ecosystem assessments and research

h. Coordination with entities on an effective outreach and education effort with measurements of the numbers of people contacted as well as changes in behavior

Shared Strategy for Puget Sound

The Shared Strategy for Puget Sound (Shared Strategy) is a collaborative effort to protect and restore salmon runs across Puget Sound. Shared Strategy engages local citizens, tribes, technical experts and policy makers to build a practical, cost-effective recovery plan endorsed by the people living and working in the watersheds of Puget Sound. The Draft Puget Sound Salmon Recovery Plan, revised in December 2005, is available for review at http://www.sharedsalmonstrategy.org/index.htm.

Puget Sound Nearshore Partnership

The Puget Sound Nearshore Partnership (PSNP) group is a cooperative effort among government organizations, tribes, industries, and environmental organizations to preserve and restore the health of Puget Sound's nearshore that generally runs from the top of bluffs on the land across the beach to the point where light penetrates the Puget Sound's waters sufficient to support attached marine vegetation (approximately 30 feet deep).

A General Investigation Reconnaissance Study conducted by the United States Army Corps of Engineers in 2000 identified a direct link between properly functioning (healthy) nearshore habitat and the physical condition of the shoreline. The study identified four areas that need restoration and improvement:

1. Restoring shoreline processes to a more natural state,

2. Providing beaches with essential sand and gravel materials,

3. Removing, moving, and modifying artificial structures (bulkheads, riprap, etc.), and

4. Using alternative measures to protect shorelines from erosion.

The timeframe for implementing projects is longer term, with projects beginning in 2008. By June 2006, PSNP will produce a strategic needs assessment for comprehensive, geospatially explicit, process-based restoration of Puget Sound's nearshore ecosystem. The PSNP Science Team is working to narrow the uncertainty inherent in restoration, by improving our understanding of the most critical restoration needs at various scales of analysis in Puget Sound. To do so, PSNP is reviewing and synthesizing a number of existing key data sets, collecting new information and adopting the most effective theories on the linkages between landscape ecology and restoration.

The current understanding of relationships between nearshore processes, structures and functions is illustrated in a nearshore conceptual model (Puget Sound Nearshore Project 2003). This conceptual model continues to be refined as scientists test new hypotheses about nearshore processes, structure and function. Preliminary outputs of this analysis are informing those engaged in nearshore habitat restoration as part of their species recovery plans through this web site and guidance to the Salmon Recovery Funding Board. In turn, actions taken by salmon recovery lead entities may serve to evaluate hypothesized relationships between restoration actions and effects on ecosystem processes and salmon populations. It is expected that over time, the relationship between local species-specific efforts and regional process-based approaches will converge to the point that the restoration goals identified by species recovery entities and those of PSNP are one and the same for many projects. Collaboration and sharing of resources will serve to bring about a common endpoint as the ecological integrity of Puget Sound is improved to the benefit of salmon, shellfish, marine birds, and other components of the ecosystem.

Puget Sound Nearshore Policy Group
Staff to the Puget Sound Action Team partnership convened a regional group to conduct a policy discussion that sets a vision for salmon recovery in Puget Sound's nearshore and marine environments. This vision will lead to actions that protect and restore Puget Sound's shorelines, marine areas and estuaries for salmon recovery.

This high-level policy group is central to development of a nearshore chapter in Shared Strategy's salmon recovery plan for Puget Sound. This group is working to establish policy direction and identify needed commitments to actions that will protect and restore Puget Sound's shorelines, marine areas, and estuaries for salmon recovery. This nearshore chapter will address regional threats to the nearshore environment and regional-scale management opportunities.

The specific objectives of the nearshore policy group are to:

1. Develop a set of regional strategies for salmon recovery in the nearshore;

2. Identify needed commitments for actions and pathways to gain those commitments;

3. Develop prescriptions for additional activities that should occur to protect and restore nearshore and marine ecosystems in the Puget Sound region; and

4. Develop an overall vision of nearshore and marine contributions to salmon recovery and integrate this vision with all other chapters of the Shared Strategy's recovery plan.

The nearshore policy group has technical support from personnel who are working with regional experts and other individuals involved in developing planning area chapters. Staff members and others are working to assess and analyze relationships among management actions that might be needed to protect and restore the nearshore and marine ecosystem processes and functions that will support viable salmon populations.

Puget Sound Partnership
In December 2005, Governor Christine Gregoire appointed 21 leaders in the Puget Sound region in commerce, research, and government as members of the Puget Sound Partnership (Partnership). She gave the group a 10-month charge to "develop recommendations for preserving the health and ecosystem of Puget Sound, and to help educate and enlist the public in achieving recovery of the Sound by 2020." The Partnership delivered its recommendations in December 2006 (Puget Sound Partnership 2006). While the entire effort of the Partnership focuses on protection and restoration of the Puget Sound ecosystem, these topics are central to two of five immediate action recommendations for the Governor: protect Puget Sound habitat and implement priority projects to restore damaged forests, rivers, shorelines, and marine waters. To protect Puget Sound habitat, the Partnership recommends substantially increasing compliance

with existing laws, primarily by increasing resources to state and local governments and acquiring land from willing sellers in watershed, estuarine, and marine shoreline areas. To restore damaged habitat, the Partnership recommends increased funding necessary to implement projects identified in recovery plans for salmon and other species and nearshore evaluation and other programs.

Several of the points made in the Partnership's recommendations bear on strategies applicable to this restoration plan:

- Regulatory and restoration actions that focus on a single species or location fail to recognize the importance of natural processes in contributing to habitat function. Process-based strategies improve the chances of a successful restoration.

- Implement high-priority restoration projects such as recovery plans for salmon and other species, and nearshore evaluation and other programs.

- Implement other critical restoration actions such as preventing the spread of invasive species, removal of derelict vessels and fishing gear, and removal of creosote logs.

- Improve the success of habitat mitigation from the current rate of 50 percent to approaching 100 percent.

The Partnership's recommendations provide a focus to coordinate restoration efforts around Puget Sound.

In 2007, legislation was adopted that made the Partnership a new state agency, replacing the Puget Sound Action Team. The Partnership will be responsible for integrating the work of state, local and federal governments, as well as local watershed planning and salmon recovery efforts.

Puget Sound Technical Recovery Team

The Puget Sound Technical Recovery Team (TRT) provides the overall scientific conceptual approach for assessing salmon recovery planning. This approach identifies the four characteristics of a population and their role in maintaining population viability. These characteristics are abundance, productivity, spatial structure and diversity. TRT liaisons help watershed groups implement their technical approach to the nearshore component of their draft habitat plans to ensure that it is consistent with the logic laid out in the Watershed Guidance.

Washington State University Shore Stewards Program/Water/Beach Watchers

Washington State University started a Shore Stewards Program in Snohomish County as part of the Water/Beach Watchers in 2005. The Beach Watcher program provides education and best practices for shoreline landowners, and participants receive a metal

Shore Stewards sign for their property. In addition to working directly with shoreline landowners, program administrators also periodically conduct public workshops, as they did in the Edmonds/Woodway area in 2006. While the number of Edmonds shoreline landowners currently participating in the program is limited, local participation is expected to increase in the future as this young program becomes more established.

WRIA 8

Watersheds often encompass broad land areas and cross various governmental jurisdictions. The Watershed Planning Act (RCW 90.82) created a mechanism to focus water-related planning on a local, watershed basis by forming the Planning Unit, composed of various interests and governments. The shorelines of Edmonds are located in Cedar River/Lake Washington Water Resource Inventory Area 8 (WRIA 8). Included in the new administrative body are counties, municipalities, utilities and tribal governments, collectively knows as Initiating Governments. The composition of the Planning Unit must include a wide range of water resource interests and representatives of state, county, and tribal governments whose policies and resources may be affected by the proposed plan. The purpose of the Planning Unit is to formulate a plan containing recommendations on water quality and quantity management, protection and restoration of instream flows, protection of fish habitat and alternative strategies for managing water, to be sent to local and state governments for adoption. The Planning Unit instituted two subgroups; the Steering Committee, to help it move forward with administrative issues; and a Technical Committee to sort through the details of resource data required to make informed water management decisions. The final plan for WRIA 8 is now available on their website.

By enacting the Watershed Planning Act in 1998, the State of Washington sought to coordinate watershed planning efforts statewide. The legislation provided for three phases—organizational, assessment, and planning—and provided funding for local execution of these phases. This act created 62 WRIAs across the state in which these activities would take place. Also in 1998, the state enacted the Salmon Recovery Planning Act (RCW 77.85) to encourage and require an enhanced effort at protecting and restoring habitat for Puget Sound Chinook salmon and other fish species then recently listed as endangered. To clarify roles and responsibilities, to promote interagency cooperation, and to coordinate efforts and simplify implementation procedures, 12 agencies within state government signed a memorandum of understanding for the coordinated implementation of these two laws.

City of Edmonds

The City of Edmonds has a number of existing programs and projects with potential benefits for the shoreline environment (restoration projects are included on "Table 2. Restoration Opportunities"). These projects and programs include:

- Waterfront acquisition – Acquire any remaining waterfront parcels to complete access to Puget Sound. This action is intended to increase public ownership of the waterfront along Puget Sound.

- Tideland acquisition – Acquire tidelands whenever feasible, working with local citizens to secure for public use as identified in the *City of Edmonds Comprehensive Park and Open Space Plan*. This action is intended to meet the need for continued waterfront access.

- Edmonds Marsh environmental master plan – Produce comprehensive environmental master plan for the Edmonds Marsh. Final document will include an ecological assessment and environmental impact study with input from the public and local organizations. Plan will directly correlate with goals and recommendations included in WRIA 8 Chinook Salmon Conservation Plan.

- Edmonds Marsh channel improvements – An environmental study regarding the current state of the marsh and its impacts from storm water runoff is proposed. The study would be reviewed by federal and state agencies and routed through the master plan process as well. Following approval of the study, dredging of the channel would commence as approved by the agencies. Dredging of the existing channels would improve the hydraulic capacity of the channel. The marsh has also experienced a recent influx of freshwater cattails migrating towards the west. This is presumably resulting from the fact that the drainage channels in the wetlands have filled with silt and therefore are not allowing the salt water to flow back as far as it used to flow. Dredging may therefore enhance diversity (saltwater marsh vegetation) in the marsh as well.

- Environmental education – Various environmental education activities and programs are offered to schools, scout groups, community organizations and the general public through the Discovery Programs Office. The mission is "to provide interpretive and environmental education opportunities for the citizens of Edmonds, our school-age children, and visitors to our parks and beaches. Additionally, the program promotes stewardship of Puget Sound, its shorelines, and the surrounding watershed." Programs include Beach Ranger visits to classrooms and low-tide beach walks, Discover the Forest at Yost Park, Earth Day, beach cleanups, spring and summer nature day camps, and special events such as the Watershed Fun Fair.

- Lake Ballinger monitoring – Roughly half of Lake Ballinger lies within Edmonds city limits. Lake was at one time deemed the most polluted in the state. Monitoring efforts are performed to evaluate environmental health of the lake and the necessity for further enhancement efforts.

Transportation Projects

Two transportation projects developing in the region—the Sound Transit commuter rail improvements and the Edmonds Crossing terminal improvements—include potential restoration projects.

Sound Transit Commuter Rail
The mitigation plan for the Everett-to-Seattle Commuter Rail Project Third Easement (Herrera Environmental Consultants, Inc. 2005) contains a restoration project identified in "Table 2. Restoration Opportunities": culvert replacement on Willow Creek. The construction of a new box culvert under the railroad track at Willow Creek would convey creek and tidal flows. This action would facilitate daylighting of the creek.

Edmonds Crossing
The Edmonds Crossing project proposes several environmental restoration actions as part of the project. These actions include:

- Daylighting Willow Creek – This action would protect and restore freshwater and estuarine habitat, improve upon tidal influence and freshwater outflow, and restore the Edmonds Marsh to estuarine habitat by improving its connection to Puget Sound. The non-railroad portion of the restoration of Willow Creek is described in the Edmonds *Crossing Environmental Impact Statement* (CH2M-Hill 2004) and would consist of open channel upstream to about the salt marsh portion of Edmonds marsh. The EIS left to be worked out during the design phase some hydraulic issues that could influence potential flooding, and there are minor variations on the approach depending on which alternative is selected. In general the creek would be open from the Puget Sound shore for about 300 feet heading east. It would then go through a culvert under the railroad tracks for about 100 feet with an emergency tide gate on the east side of the tracks. It is then open to the east for another 800 feet or so. This downstream 1,200-foot reach is channelized; the plans indicate that the streambed of the upstream reach is natural.

- Removal of the existing Unocal pier at Point Edwards – This action would eliminate contamination, protect and restore nearshore habitat, and improve visual and physical access to Puget Sound.

- Removing portions of the existing ferry terminal that sits on creosote piling – This action would remove pilings, restore aquatic habitat, and minimize the potential offshore diversion of juvenile salmonids.

- Restoration of macroalgae and eelgrass beds near the existing ferry terminal that have been damaged by several decades of propeller wash – This action would connect two macroalgae and eelgrass beds that are presently divided due to ferry propeller-induced scouring.

- Install newer and larger culvert near Pine Street and State Route 104 – This action would improve stream flow as well as fish and wildlife passage.

Burlington Northern Santa Fe Railway
The BNSF railway, as discussed in the Shoreline Inventory and Characterization report, significantly influences the ecological processes and functions of the Edmonds shoreline.

When a restoration effort involving the City might benefit from the participation of BNSF, the City would make every reasonable effort to contact and engage railroad officials.

Restoration Strategies

This section discusses programmatic measures for the City designed to foster shoreline restoration and achieve a net improvement in shoreline ecological processes, functions, and habitats. With projected budget and staff limitations, the City does not anticipate leading most restoration projects or programs. However, the City's SMP represents an important vehicle for facilitating and encouraging restoration projects and programs that could be led by private and/or non-profit entities. The discussion of restoration mechanisms and strategies below highlights programmatic measures that the City could implement, as well as parallel activities that would be led by other governmental and non-governmental organizations.

Restoration Demonstration Project

A small demonstration restoration project that included a variety of techniques could be completed by the City as an example for others. The City could also identify a set of good demonstration restoration projects (which have broad public support), then actively solicit entities to implement one or more of them. Additionally, the City could work with existing programs such as the Sound Transit JARPA mitigation project or the Edmonds Crossing mitigation project to leverage funding and efforts to implement smaller scale demonstration projects.

Volunteer Coordination

Another way the City could accomplish restoration projects is by using community volunteers. Volunteers could be recruited for project implementation and monitoring and the City would provide equipment and expertise. The City would also need to fund a volunteer coordinator to organize projects, solicit various environmental groups and individual volunteers to complete the projects and partner or coordinate with other government entities on projects.

Regional Coordination

The City should continue its active role in the WRIA 8 salmon recovery planning process, an inter-governmental organization facilitating freshwater and shoreline habitat restoration for salmon recovery. The City should also look for other opportunities for involvement in regional restoration planning and implementation.

Development Opportunities

When shoreline development is proposed, the City should look for opportunities to conduct restoration in addition to minimum mitigation requirements. Development may present timing and funding opportunities for restoration that would not otherwise occur and may not be available in the future.

Mitigation practices may also allow for the “banking” of credits from restoration projects that can provide advanced mitigation credit for future unavoidable impacts of development. In certain cases, on-site mitigation opportunities are limited due to building site constraints, limited potential ecological gains, or other site-specific factors. In these instances, the City shoreline administrator may identify an off-site restoration site that could be contributed in lieu of on-site mitigation.

Development Incentives

Development incentives for restoration might include the waiving of some or all of development application fees or waiving City-required infrastructure improvement fees. This could serve to encourage developers to try to be more imaginative or innovative in their development designs to include more habitat preservation or restoration, or public access to shorelines.

Tax Relief/Fee System

The City may consider a tax/fee system to directly fund shoreline restoration measures. One possibility is to have the City work with Snohomish County to craft a preferential tax incentive through the Public Benefit Rating System administered by Snohomish County under the Open Space Taxation Act (RCW 84.34) to encourage private landowners to preserve natural shore-zone features for "open space" tax relief. Ecology has published a technical guidance document for local governments who wish to use this tool to improve landowner stewardship of natural resources. More information about this program can be found at http://www.ecy.wa.gov/biblio/99108.html. The guidance in this report provides "technically based property selection criteria designed to augment existing open space efforts with protection of key natural resource features which directly benefit the watershed. Communities can choose to use any portion, or all, of these criteria when tailoring a Public Benefit Rating System to address the specific watershed issues they are facing."

Another possibility available to the City is a Shoreline Restoration Fund. A chief limitation to implementing restoration is local funding, which is often required as a match for state and federal grant sources. To foster ecological restoration of the City’s shorelines, the City could establish an account that may serve as a source of local match monies for non-profit organizations implementing restoration of the City’s shorelines. This fund could be administered by the City shoreline administrator and would be supported by a levy on new shoreline development proportional to the size or cost of the new development project. Monies drawn from the fund would be used as a local match for restoration grant funds, such as the Salmon Recovery Funding Board Aquatic Lands Enhancement Account or another source.

Shore Stewards Education

Shore Stewards are shoreline property owners and residents of waterfront communities with shared beach access who voluntarily follow 10 wildlife-friendly guidelines in caring for their beaches, bluffs, gardens and homes. These guidelines help them create and preserve a healthy shoreline environment for fish, wildlife, birds and people. This program was created to help shoreline residents feel more connected to the nearshore

ecosystem because it is found that when people understand the natural processes at work on their beaches, they may play a more active, positive role in the preservation of healthy, fish-friendly wildlife habitats.

The 10 guidelines for shoreline living are:

1. Use water wisely
2. Maintain your septic system
3. Limit pesticide and fertilizer usage
4. Manage upland water runoff
5. Encourage native plants and trees
6. Know permit procedures for shoreline development
7. Develop on bluffs with care
8. Minimize bulkheads, docks and other structures
9. Respect intertidal life
10. Preserve eelgrass beds and forage fish spawning habitat

Shore Stewards was created in 2002 with grant funding by the Island County Marine Resources Committee. The pilot program was launched on Camano Island by Washington State Beach Watchers, who wrote the resource-packed Shore Stewards Guide. Shore Stewards is now expanding to other counties of Puget Sound, including Snohomish County.

Stewardship Certification Process

The Shore Stewards program sets up guidelines for shoreline residents to preserve and enhance the shoreline environment. With a verification component, Shore Stewards could provide certification and tracking. This could be implemented as a Shoreline Tax Incentive when someone participates in the Washington Department of Fish and Wildlife (WDFW) backyard sanctuary program. Since the City recognizes that there are important opportunities to improve shoreline ecological conditions and functions through non-regulatory, volunteer actions by shoreline residents and property owners it might examine the potential for property tax breaks for shoreline property owners who are actively manage their property for habitat protection or enhancement. To encourage volunteer actions that better shoreline ecological functions and values, shoreline property owners actively participating in the WDFW backyard sanctuary program or some similar program could receive, for example, a 5% credit on their City property taxes.

Resource Directory

The City could develop a resource list for property owners that want to be involved in restoration. Examples of grant programs that could be included are:

Landowner Incentive Program (LIP)
The Landowner Incentive Program (LIP) is a competitive grant process to provide financial assistance to private individual landowners for the protection, enhancement, or restoration of habitat to benefit species-at-risk on privately owned lands. The LIP website, http://federalaid.fws.gov/lip/lip.html, has more information about the next application cycle.

Salmon Recovery Funding Board (SRFB) Grant Programs
The Salmon Recovery Funding Board (SRFB) administers two grant programs for protection and/or restoration of salmon habitat. Eligible applicants can include municipal subdivisions (cities, towns, and counties, or port, conservation districts, utility, park and recreation, and school districts), tribal governments, state agencies, nonprofit organizations, and private landowners. The City should continue making use of the SRFB grant programs through its participation in the activities of the lead entity WRIA 8.

Backyard Sanctuary Program
The City should encourage participation in WDFW wildlife backyard sanctuary program.

Project Evaluation

When a project is proposed for implementation by the City, other agency or by a private party, the restoration project should be evaluated to ensure that the project's objectives are consistent with those of this restoration plan and, if applicable, that the project warrants implementation above other candidate projects. (It is recognized that, due to funding sources or other constraints, the range of any individual project may be narrow.)

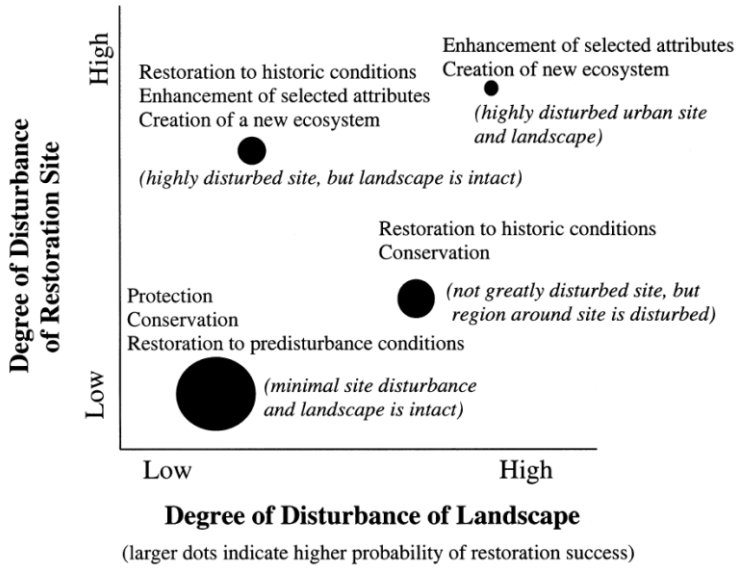


Figure 2 (Thom 2005)

It is also expected that the list of potential projects may change over time, that new projects will be identified and existing opportunities will become less relevant as restoration occurs and as other environmental conditions, or our knowledge of them, change.

When evaluating potential projects, the following nine criteria should be considered in assessing priority (the criteria are not listed in any order of importance):

a. Restoration meets the goals and objectives for shoreline restoration.

b. Restoration of processes that form and sustain habitat is generally of greater importance than direct restoration of functions.

c. Restoration avoids residual impacts to other functions or processes.

d. Projects address a known degraded condition.

e. Conditions that are progressively worsening are of greater priority.

f. Restoration has a high benefit to cost ratio.

g. Restoration is feasible, such as being located on and accessed by public property or private property that is cooperatively available for restoration. Restoration should avoid conflicts with adjacent property owners.

h. There is public support for the project.

i. The project is supported by and consistent with other restoration plans, such as that for WRIA 8.

The City shall develop a project "score card" as a tool to evaluate projects consistent with these criteria. As an example, see the project scorecard from the Lower Columbia River Estuary Partnership that uses eight principles (Johnson et al. 2003). The eight principles are:

- Size;
- Complexity;
- Accessibility;
- Connectivity of adjacent habitats;
- Potential quality includes the potential for self-maintenance;
- Substantial improvement of ecosystem functions;

- Benefit to nearshore-dependent threatened and endangered species; and

- Conformance with natural habitat structure, processes, and functions.

Monitoring and Adaptive Management

In addition to project monitoring required for individual restoration and mitigation projects, the City should conduct system-wide monitoring of shoreline conditions and development activity, to the degree practical, recognizing that individual project monitoring does not provide an assessment of overall shoreline ecological health. System-wide monitoring will follow this three-pronged approach:

1. Track information using the City's GIS and permit system as activities occur (development, conservation, restoration and mitigation), such as:

    a. New shoreline development
    b. Shoreline variances and the nature of the variance
    c. Compliance issues
    d. New impervious surface areas
    e. Number of pilings removed/replaced
    f. Fill area removed/added
    g. Vegetation retention/loss
    h. Bulkheads/armoring additions or changes

    The City may require project proponents to monitor as part of project mitigation, which may be incorporated into this process. Regardless, as development and restoration activities occur in the shoreline area, the City should monitor shoreline conditions to determine whether both project specific and SMP overall goals are being achieved.

2. Periodically review and provide input to ongoing regional monitoring programs, such as:

    a. DNR monitoring (e.g., eelgrass distribution)
    b. Puget Sound Ambient Monitoring Program
    c. University of Washington (the Puget Sound Regional Synthesis Model)
    d. Puget Sound Nearshore Partnership

    Through this coordination with regional agencies, the City should seek to identify any major environmental changes that might be occurring.

3. Re-review status of environmental processes and functions at the time of periodic SMP updates to, at a minimum, validate the effectiveness of the SMP. Re-review should consider what restoration activities actually occurred

compared to stated goals, objectives and priorities, and whether restoration projects resulted in a net improvement of shoreline resources.

Under the Shoreline Management Act, the SMP is required to result in no net loss of shoreline ecological resources. If this standard is found to not be met at the time of review, Edmonds will be required to take corrective actions. The goal for restoration is to achieve a net improvement. The cumulative effect of restoration over the time between reviews should be evaluated along with an assessment of impacts of development that are not fully mitigated to determine effectiveness at achieving a net improvement to shoreline ecological resources.

To conduct a valid reassessment of the shoreline conditions every seven years, it is necessary to monitor, record and maintain key environmental metrics (quantitative measures and calculations used to assess success) to allow a comparison with baseline conditions.

As monitoring occurs, the City should reassess environmental conditions and restoration objectives. Those ecological processes and functions that are found to be worsening may need to become elevated in priority to prevent loss of critical resources. Alternatively, successful restoration may reduce the importance of some restoration objectives in the future.

Evaluation of shoreline conditions, permit activity, GIS data, and policy and regulatory effectiveness should occur at varying levels of detail consistent with the Comprehensive Plan update cycle. A complete reassessment of conditions, policies and regulations will be undertaken every seven years.

Uncertainty

This restoration plan proposes project opportunities to restore shoreline conditions. The restoration opportunities included are based upon a detailed inventory and analysis of shoreline conditions (Pentec 2001, Sea-Run Consulting et al. 2006). Nonetheless, exhaustive scientific information about shoreline conditions and restoration options is cost prohibitive at this stage. Additionally, many forms of restoration remain, to a degree, experimental. Monitoring must be an aspect of all restoration projects. Information from monitoring studies (local and Puget Sound-wide) will help demonstrate what restoration is most successful in the particular environment of the City's shorelines. Generally, conservation of existing natural areas is the least likely to result in failure. Alternatively, enhancement (as opposed to complete restoration of functions), has the highest degree of uncertainty.

This SMP provides a comprehensive index of restoration opportunities but does not provide the backup analyses that would allow the City to objectively compare opportunities against each other. As funding becomes available, restoration opportunities could be ranked on several criteria by expected rate and degree of success,

resources/habitats/functions that would benefit, cost, and other factors. Funding could also support a long-term monitoring program that evaluates restoration over the life of the SMP (as opposed to independent monitoring for each project).

Potential Funding Sources

Potential sources of grant funding for restoration opportunities on the City's shorelines have been documented in Table 3.

Table 3: Funding Opportunities			
Grant Name	**Allocating Entity**	**Grant Size**	**Contact**
Acorn Foundation	Acorn Foundation (family foundation that supports projects dedicated to building a sustainable future for the planet and to restoring a healthy global environment)	$5,000-$10,000	**Elizabeth Wilcox** Phone: (510) 834-2995 Email: ccounsel@igc.org
Aquatic Ecosystems	Bullitt Foundation (private philanthropic foundation providing funding to nonprofit organizations working to safeguard the natural environment by promoting responsible human activities and sustainable communities in the Pacific Northwest)	Varies	**Steven Whitney** Email: swhitney@bullitt.org
Aquatic Lands Enhancement Account	Washington Department of Natural Resources	$10,000-$1 million	**Leslie Ryan** Phone: (360) 902-1064 Email: leslie.ryan@wadnr.gov
Audubon Washington	Audubon Washington	Varies	Phone: (360) 786-8020
Basinwide Restoration New Starts General Investigation	United States Army Corps of Engineers	Varies	**Bruce Sexauer** Phone: (206) 764-6959 Email: bruce.r.sexauer@usace.army.mil
Bring Back the Natives	National Fish and Wildlife Foundation	Varies	**Pam McClelland** Phone: (202) 857-0166 Email: mcclelland@nfwf.org

Table 3: Funding Opportunities			
Grant Name	**Allocating Entity**	**Grant Size**	**Contact**
Centennial Clean Water Fund	Washington State Department of Ecology		**Jeff Nejedly** Phone: (360) 407-6566 Email: jnej461@ecy.wa.gov
City Fish Passage Barrier, Stormwater and Habitat Restoration Grant Program	Washington Department of Transportation	Varies	**Cliff Hall** Phone: (360) 705-7993 Email: hallc@wsdot.wa.gov
Coastal Grant Program	United States Fish & Wildlife Service	$5,000-$50,000	**Coastal Grant Contact** Phone: (703) 358-2201
Coastal Zone Management Administration/ Implementation Awards	Washington State Department of Ecology	$19,000-$29,000	**Bev Huether** Phone: (360) 407-7254 Email: bhue461@ecy.wa.gov
Community-Based Restoration Program	National Oceanic and Atmospheric Administration	$1,000-$500,000	**Chris Doley** Phone: (301) 713-0174 Email: chris.doley@noaa.gov
Cooperative Endangered Species Conservation Fund	United States Fish & Wildlife Service	$1,000-$14,000	**Dan Morgan** Phone: (703) 358-2061 Email: Dan_Morgan@fws.gov
Doris Duke Charitable Foundation	Doris Duke Charitable Foundation	Multi-year grants that range from $125,000-$3.5 million	**Adrienne Fisher** Phone: (212) 974-7000 Email: afisher@ddcs.org

Table 3: Funding Opportunities			
Grant Name	**Allocating Entity**	**Grant Size**	**Contact**
Estuarine and Salmon Restoration Program	Washington Department of Fish and Wildlife	Varies	**Paul Cereghino** Email: ESRP@dfw.wa.gov
FishAmerica Grant Program	FishAmerica Foundation	Varies	**Johanna Laderman** Phone: (703) 519-9691 Email: jladerman@asafishing.org
Five-Star Restoration Program	Environmental Protection Agency	$5,000-$20,000 (subgrants average $10,000)	**John Pai** Phone: (202) 260-8076 Email: pai.john@epa.gov
FMC Corporation Bird and Habitat Conservation Fund	FMC Corporation and The National Fish and Wildlife Foundation	Varies	**Peter Stangel** Phone: (404) 769-7099 Email: stangel@nfwf.org
Forest Legacy Program – Washington	United States Forest Service, Washington Department of Natural Resources	Varies	**Brad Pruitt** Phone: (360) 902-1102 Email: brad.pruitt@wadnr.gov
Habitat Conservation	United States Fish and Wildlife Service Coastal Program	Varies	**Sally Valdes** Phone: 703-358-2201 Email: sally.valdes@fws.gov
Hugh and Jane Ferguson Foundation	Hugh and Jane Ferguson Foundation (family foundation which supports nonprofit organizations in the Pacific Northwest and Alaska. Dedicated to the preservation and restoration of nature, including wildlife and their required habitats)	$2,000-$7,500	**Therese Ogle** Phone: (206) 781-3472 Email: OgleFounds@aol.com

Table 3: Funding Opportunities			
Grant Name	**Allocating Entity**	**Grant Size**	**Contact**
Landowner Incentive Program	Washington State Department of Fish and Wildlife, Lands Division	Up to $5,000 for small grants; others up to $50,000	**Ginna Correa or Jeff Skriletz** Phone: (360) 902-2478 or (360) 902-8313 Website: http://wdfw.wa.gov/lands/lip
Matching Aid to Restore States Habitat (MARSH)	Ducks Unlimited	Varies	**Ducks Unlimited** Phone: (916) 852-2000 Email: conserv@ducks.org
Migratory Bird Conservancy	National Fish and Wildlife Foundation	$10,000-$60,000	**Peter Stangel** Phone: (404) 769-7099 Email: stangel@nfwf.org
Native Plant Conservation Initiative	Bureau of Land Management, Forest Service, Fish and Wildlife Service, and National Park Service	$10,000-$50,000	**Caroline Cremer** Phone: (202) 857-0166 Email: caroline.cremer@nfwf.org
Nonpoint Source Implementation Grant (319) Program	Environmental Protection Agency, Washington State Department of Ecology	Varies	**Aleciea Tilley** Email: atill461@ecy.wa.gov
North American Wetlands Conservation Act Grants Program	United States Fish & Wildlife Service	$100,000-$1 million (small grants capped at $50,000)	**Bettina Sparrowe** Phone: (703) 358-1784 Email: r9arw_nawwo@fws.gov
Pacific Grassroots Salmon Initiative	National Fish & Wildlife Foundation	$5,000-$100,000	**Anna Weinstein** Phone: (415) 778-0999 Email: weinstein@nfwf.org

Table 3: Funding Opportunities			
Grant Name	**Allocating Entity**	**Grant Size**	**Contact**
Planning/Technical Assistance Program	Bureau of Reclamation	Varies	**Dave Nelson** Phone: (503) 872-2801 Email: drnelson@pn.usbr.gov
Puget Sound Program	United States Fish & Wildlife Service	Varies	**Mary Mahaffy** Phone: (360) 753-7763 Email: mary_mahaffy@fws.gov
Puget Sound Wetland Restoration Program	Washington State Department of Ecology	Technical assistance	**Richard Gersib** Phone: (360) 407-7259 Email: rger461@ecy.wa.gov
Regional Fisheries Enhancement Groups	Washington State Department of Fish and Wildlife	$10,000-$40,000	**Kristi Lynett** Phone: (360) 902-2237 Email: lynetksl@dfw.wa.gov
Salmon Recovery Funding Board	Interagency Committee for Outdoor Recreation	Varies	**Rollie Geppert** Phone: (360) 902-2636 Email: Salmon@iac.wa.gov
Section 204: Environmental Restoration Projects in Connection with Dredging	United States Army Corps of Engineers	75% of total project modification costs	**Mona Thomason** Phone: (206) 764-3600 Email: mona.j.thomason@usace.army.mil
Section 206: Aquatic Ecosystem Restoration Program	United States Army Corps of Engineers	65% of total project implementation cost	**Martin Hudson** Phone: (503) 808-4703 Email: martin.hudson@usace.army.mil

Table 3: Funding Opportunities			
Grant Name	**Allocating Entity**	**Grant Size**	**Contact**
Transportation Environmental Research Program (TERP)	Federal Highway Administration	$20,000-$50,000	**Michael Koontz** Phone: 410-962-4586 Email: michael.koontz@fhwa.dot.gov
Transportation Equity Act for the 21st Century (TEA-21)	Washington Department of Transportation	Varies	**Shari Schaftlein** Phone: (360) 705-7446 Email: sschaft@wsdot.wa.gov
Washington State Ecosystems Conservation Program	United States Fish & Wildlife Service	$500-$26,000	**Rich Carlson** Phone: (360) 753-5829 Email: rich_carlson@fws.gov
Wetland Protection, Restoration, and Stewardship Discretionary Funding	Environmental Protection Agency	$5,000-$20,000	**Christina Miller** Phone: (206) 553-6512 Email: miller.christina@epa.gov

Restoration Glossary

Abiotic: Nonliving, such as environmental factors including light, temperature, and atmospheric gases.

Biotic: Produced or caused by living organisms or having to do with life or living organisms.

Disturbance: Any relatively discrete event in time and space that disrupts or alters some portion of an ecosystem. Disturbances are important factors that affect the character and state of ecosystems. Examples from nearshore ecosystems include:

- Winter storms, which move large quantities of organic (e.g., logs) and inorganic (e.g., sand) materials that can reshape beaches.
- Landslides, which deposit sand and gravel from bluffs onto beaches and into nearshore marine waters.
- Shifts in ocean currents, which can result in changes in nutrient availability, water temperature, primary production, and food web relationships.

Ecosystem: Community of organisms and their physical and chemical environment interacting as an ecological unit.

Ecosystem process: Any interaction among physical, chemical and biological elements of an ecosystem that involves a change in character or state of that system. In nearshore ecosystems, some examples include the following:

- Changes in chemical composition of the water or sediment that occur as part of nutrient uptake and transformation.
- Movement and mixing of fresh and salt water through an estuarine delta.
- Sediment transport along the shoreline.

Ecosystem recovery: Taking actions that allow an ecosystem to generate and maintain processes that result in desirable ecosystem structure (e.g., habitats for valued species) and functions (e.g., forage fish production).

Habitat: The physical, chemical and biological characteristics of a specific spatial unit or geographic area of the environment occupied by specific biota (e.g., we refer to "Pacific sand lance habitat" and "sand beach ecosystems"). To define habitat, it is necessary to know the spatial extent in the ecosystem of a specific habitat for the plant or animal considered, and the attributes of the habitat that support growth and survival of that organism.

Nearshore: The estuarine/delta, marine shoreline and areas of shallow water from the top of the coastal bank or bluffs to the water at a depth of about 30 meters below Mean Lower Low Water. (This is the average depth limit of light penetration.) This zone incorporates those geological and ecological processes, such as sediment movement, freshwater inputs, and subtidal light penetration, which are key to determining the distribution and condition of aquatic habitats. By this definition, the nearshore extends landward into the tidally influenced freshwater heads of estuaries and coastal streams.

Resource Links and References

Battelle Memorial Institute, Reconnaissance Assessment of the State of the Nearshore Ecosystem: Eastern Shore of Central Puget Sound, Including Vashon and Maury Islands (WRIAs 8 and 9). Seattle: King County DNR, http://dnr.metrokc.gov/wlr/watersheds/puget/nearshore/sonr.htm 2001.

CH_2M Hill 2004. SR 104 Edmonds Crossing; Final Environmental Impact Statement and Final Section 4(f) Evaluation. Prepared for Federal Highway Administration, U.S. Department of Transportation; Federal Transit Administration; Washington State Department of Transportation; and City of Edmonds. Prepared by CH_2M Hill, Bellevue, Washington. November 2004.

Diefenderfer, H.L., Ronald M. Thom and J.E. Adkins. For the Expert: Systematic Approach to Coastal Ecosystem Restoration. Battelle Memorial Institute Pacific Northwest Division: Richland: NOAA, http://www.csc.noaa.gov/coastal/expert/systematic/systematic.htm, 2003.

Fresh, K., C. Simenstad, J. Brennan, M. Dethier, G. Gelfenbaum, F. Goetz, M. Logsdon, D. Myers, T. Mumford, J. Newton, H. Shipman, C. Tanner. 2004. Guidance for protection and restoration of the nearshore ecosystems of Puget Sound. Puget Sound Nearshore Partnership Report No. 2004-02. Published by Washington Sea Grant Program, University of Washington, Seattle, Washington. Available at http://pugetsoundnearshore.org/.

Goetz, F., C. Tanner, C.S. Simenstad, K. Fresh, T. Mumford, and M. Logsdon, 2004. Guiding restoration principles. Puget Sound Nearshore Partnership Report No. 2004-03. Published by Washington Sea Grant Program, University of Washington, Seattle, Washington. Available at http://pugetsoundnearshore.org/.

Herrera Environmental Consultants, Inc. 2005. Conceptual Nearshore Marine, Estuarine, and Wetland Mitigation Plan, Everett-to-Seattle Commuter Rail Project Third Easement, King and Snohomish Counties, Washington. Prepared for Sound Transit, Seattle, Washington. Prepared by Herrera Associates, Inc., Seattle, Washington. August 2005. [not seen; information from Order Number 3306; 401 Water Quality Certification by Washington Department of Ecology.]

Johnson, G. E., R. M. Thom, A. H. Whiting, G. B. Sutherland, J. A.Southard, B. D. Ebberts, and J. D. Wilcox. 2003. An ecosystem-based approach to habitat restoration projects with emphasis onsalmonids in the Columbia River Estuary. Final report prepared bythe Bonneville Power Administration, Columbia River Estuary Study Taskforce, Lower Columbia River Estuary Partnership, Pacific Northwest National Laboratory (PNNL) and U.S. Army Corps of Engineers, Portland District, Portland, Oregon. PNNL-14412. [not seen]

Pentec Environmental (Pentec) 2001. Edmonds Shoreline Habitat Assessment. Pentec # 1213012. Prepared for City of Edmonds. October 31, 2001.

People for Puget Sound. Sound Stewardship Program. Seattle: http://pugetsound.org/index/pubs.

Port Townsend. City of, 2005. Chapter 14: Shoreline Restoration. Draft 5. 21 December 2005. Part of City of Port Townsend Shoreline Master Program Update.

Puget Sound Action Team. Puget Sound Ambient Monitoring Program. Seattle: http://www.pugetsoundnearshore.org/material_activity.html#papers.

Puget Sound Action Team 2007. 2007-2009 Puget Sound Conservation & Recovery Plan. January 2007. Olympia, Washington. http://www.psat.wa.gov/2007-2009plan.

Puget Sound Water Quality Action Team 2001. 2000 Puget Sound Water Quality Management Plan; Adopted December 14, 2000. Olympia, Washington. http://www.psat.wa.gov/2000managementplan.

Puget Sound Nearshore Partnership 2003. Nearshore Ecosystems Conceptual Model. Fact sheet available at http://www.pugetsoundnearshore.org/techical papers/conceptualmodel.pdf. [viewed 4 October 2006].

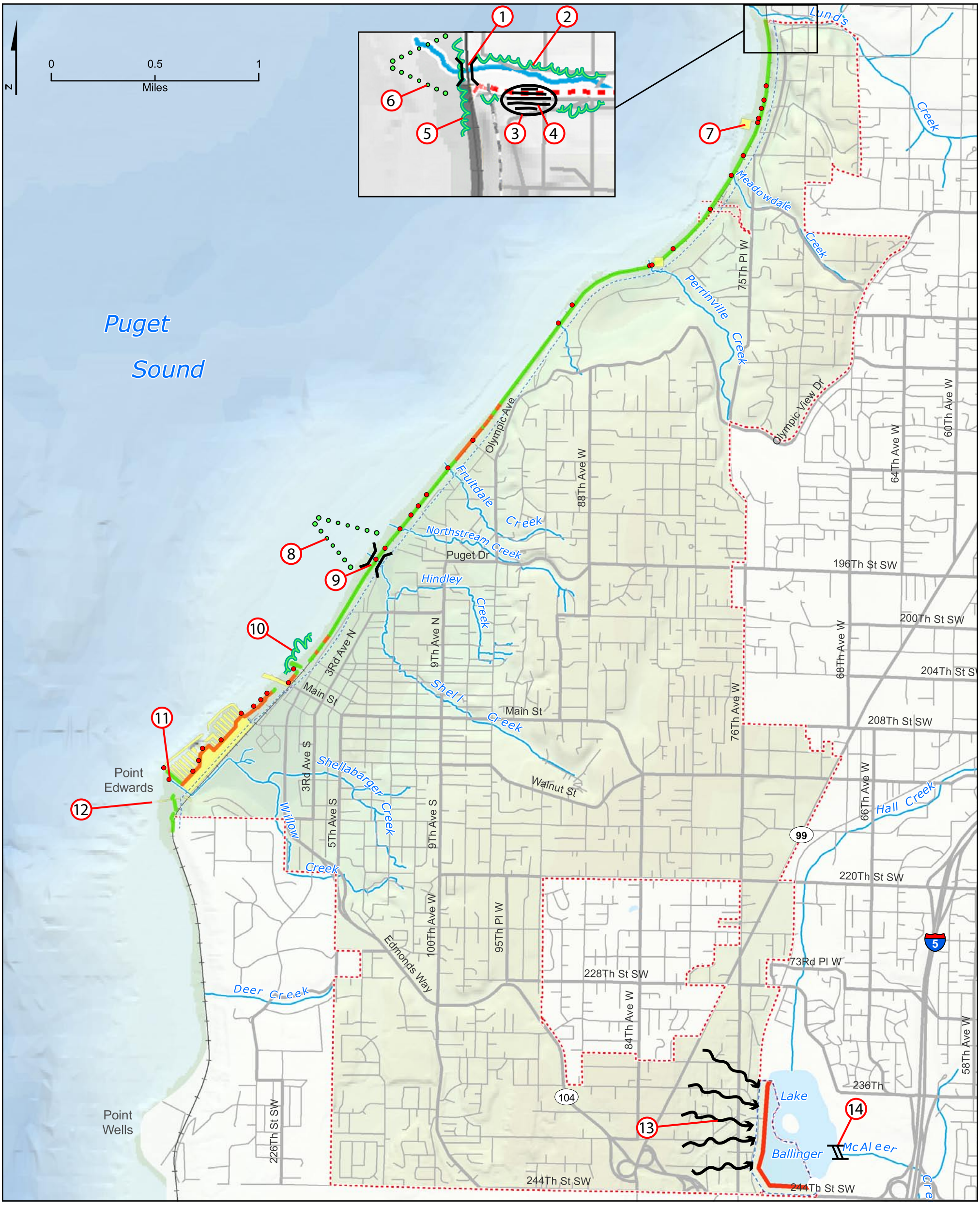
Puget Sound Partnership 2006. Sound Health, Sound Future; Protecting and Restoring Puget Sound. December 2006. http://www.pugetsoundpartnership.org/reports/final/final/Final_wAPPx_lr.pdf.

Sea-Run Consulting, TetraTech, Inc., Reid Middleton, Inc., and Pentec 2006. City of Edmonds; Shoreline Master Program Update; Draft Shoreline Inventory & Characterization. SMA Grant Agreement No. 60600108. Prepared for City of Edmonds. June 2006.

Thom, Ronald M., Gregory D. Williams and Amy B. Borde. Conceptual Models as a Tool for Assessing, Restoring, and Managing Puget Sound Habitats and Resources. Bainbridge Island: City of Bainbridge Island, http://www.psat.wa.gov/Publications/03_proceedings/PAPERS/ORAL/9e_thom.pdf, 2003.

Van Cleve, F. B., C. Simenstad, F. Goetz, and T. Mumford. Application of Best Available Science in Ecosystem Restoration: Lessons Learned from Large-Scale Restoration Efforts in the USA. Puget Sound Nearshore Partnership Report No. 2004-01. Seattle: Washington Sea Grant Program, University of Washington, 2004.

Williams, Gregory D., and Ronald M. Thom. Marine and Estuarine Shoreline Modification Issues. Sequim: Battelle Marine Sciences Laboratory, http://www.wdfw.wa.gov/hab/ahg/marnrsrc.htm 2001.



Legend

- City Outfall
- Shoreline Armoring
  - Sloped
  - Vertical
- Beach Nourishment
- Off-Channel Pond
- Over/In Water Structure
- DRAFT SMP Jurisdiction
- Edmonds City Limits
- Major Road
- New Crossing (wider box culvert or trestle)
- Woody Debris
- Street
- Railroad
- Stream
- Water Bodies
- Riparian Vegetation

Data Sources:
Over/In Water Structures, Snohomish County Shoreline Inventory (2002), aerial photos digitizing (2006) Shoreline Armoring, Snohomish County Shoreline Inventory (2002)
Outfall Locations, City of Edmonds 2003 (Data only includes City of Edmonds drainage pipes)

CITY OF EDMONDS Inc. 1890

City of Edmonds

Shoreline Master Program Update

Potential Restoration Projects

Figure 13

Date of Last Revision: 12-05-06