

TOWN OF STEILACOOM

Shoreline Restoration Plan Element

Prepared for:

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Town of Steilacoom



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1.0 INTRODUCTION

This report prepared by ESA and Coastal Geologic Services (CGS) provides the restoration element of the Town of Steilacoom’s Shoreline Master Program (SMP). Last amended in 1987, the SMP is being updated to comply with the Shoreline Management Act (SMA) requirements (RCW 90.58), and the State’s SMP guidelines (Washington Administrative Code [WAC] 173-26, Part III), which went into effect in 2003.

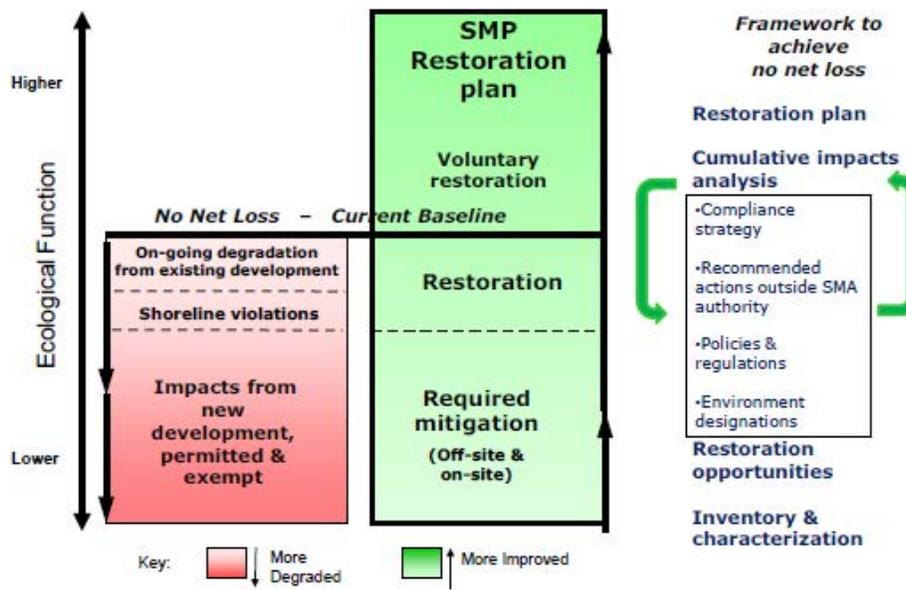
The SMP guidelines require that local governments develop SMP policies that promote “restoration” of impaired shoreline ecological functions and a “real and meaningful” strategy to implement restoration objectives. The Town’s shoreline inventory and characterization report (ESA Adolfson, 2011) identifies which shoreline ecological functions and ecosystem processes have been impaired. In updating its SMP, the Town is required to identify and plan for ways to restore or enhance those functions and processes that have been impaired. In the context of the SMP, planning for shoreline restoration includes establishing goals and policies, working cooperatively with other regional entities, and supporting restoration through other regulatory and non-regulatory programs.

1.1 Regulatory Background

The State has directed local governments to develop SMP provisions “...to achieve overall improvements in shoreline ecological functions over time when compared to the status upon adoption of the master program.” This overarching goal is accomplished primarily through two distinct objectives:

- **Protection** of existing shoreline functions through regulations and mitigation requirements to ensure “no net loss” of ecological functions from baseline environmental conditions; and
- **Restoration** of shoreline ecological functions that have been impaired from past development practices or alterations.

Figure 1 below illustrates the role of the SMP update in achieving no net loss both through mitigation and restoration.



Source: Department of Ecology

Figure 1. Achieving No Net Loss of Ecological Function

The concept of no net loss of shoreline ecological function is embedded in the SMA and in the goals, policies and governing principles of the shoreline guidelines. The State’s general policy goals for shorelines of the state include the “protection and restoration of ecological functions of shoreline natural resources.” This goal derives from the SMA, which states, “permitted uses in the shoreline shall be designed and conducted in a manner that minimizes insofar as practical, any resultant damage to the ecology and environment of the shoreline area.” The governing principles of the guidelines further clarify that protection of shoreline ecological functions is accomplished through the following (WAC 173-26-186):

- a) Meaningful understanding of the current shoreline ecological conditions;
- b) Regulations and mitigation standards that ensure that permitted developments do not cause a net loss of ecological functions;
- c) Regulations that ensure exempt developments in the aggregate do not result in net loss of ecological functions;
- d) Goals and policies for restoring ecologically impaired shorelines;
- e) Regulations and programs that fairly allocate the burden of mitigating cumulative impacts among development opportunities; and
- f) Incentives or voluntary measures designed to restore and protect ecological functions.

It is important to note that the restoration planning component of the SMP is focused on voluntary mechanisms, not regulatory provisions. Restoration planning is focused on economic incentives, available funding sources, volunteer programs, and other programs that can contribute to a no net loss strategy. However, the restoration framework developed for these non-compensatory mitigation projects can also be applied to compensatory mitigation projects. In this way, all efforts to improve ecosystem functioning are coordinated, and will be designed to work together.

1.2 Defining Restoration

There are numerous definitions for “restoration” in scientific and regulatory publications. Specific elements of these definitions often differ, but the core element of repairing damage to an existing, degraded ecosystem remains consistent. In the SMP context, the WAC defines “restoration” or “ecological restoration” as:

“...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” (WAC 173-26-020(27)).

Using the WAC definition of restoration in regard to state shorelines, it is clear the effort should be focused on specific shoreline areas where natural ecological functions have been impaired or degraded. The emphasis in the WAC is to achieve overall improvement in existing shoreline processes or functions, if these functions are impaired. Therefore, the goal is not to restore historically natural conditions, but rather to improve on existing, degraded conditions. In this context, restoration can be broadly implemented through a combination of programmatic measures (such as surface water management; water quality improvement; public education) and site-specific projects (such as bulkhead replacement and/or riparian plantings). It is important to note that the guidelines do not state that local programs should or could require individual permittees to restore past damages to an ecosystem as a condition of a permit for new development (Ecology, 2004). For these reasons, the required restoration planning element focuses on the Town as a whole rather than parcel by parcel, or permit by permit.

1.3 Key Elements of Restoration Planning in the SMP Update Process

The State guidelines provide six key elements for shoreline restoration planning as part of a local jurisdiction’s master program, as outlined in WAC 173-26-201(2)(f). These elements are summarized below in Table 1, and provide the organization and content for this report.

Table 1. Restoration Planning Structure

Key elements for the shoreline restoration planning process WAC 173-26-201(2)(f)	Section in this report
Identify degraded areas, impaired ecological functions, and sites with potential for ecological restoration.	Assessment of Functions (Sec. 2); Restoration Opportunities (Sec. 4)
Establish overall goals and priorities for restoration of degraded areas and impaired ecological functions.	Policy Development (Sec. 5)
Identify existing and ongoing projects and programs that are currently being implemented that are designed to contribute to local restoration goals (such as capital improvement programs (CIPs) and watershed planning efforts (WRIA habitat/recovery plans).	Existing Plans and Programs (Sec. 3)
Identify additional projects and programs needed to achieve local restoration goals, and implementation strategies including identifying prospective funding sources for those projects and programs.	Assessment of Functions (Sec. 2); Restoration Opportunities (Sec. 4)
Identify timelines and benchmarks for implementing restoration projects and programs and achieving local restoration goals.	Implementation (Sec. 5)
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 (e.g., monitoring of restoration project sites).	Implementation (Sec. 5)

2.0 ASSESSMENT OF FUNCTIONS

Shoreline restoration planning begins with the identification of “degraded areas” or areas with “impaired ecological functions.” The assessment of existing degraded areas and/or functions relies on the *Town of Steilacoom’s Shoreline Inventory and Characterization* (ESA Adolphson, 2011). The Town’s inventory and characterization examined marine nearshore ecosystem processes that maintain shoreline ecological functions and identified impaired ecological functions. Key findings of the inventory and characterization are summarized below.

2.1 Regional Setting

The Town of Steilacoom lies entirely within the Chambers Creek – Clover Creek Water Resources Inventory Area (WRIA) 12. WRIA 12 encompasses approximately 115,000 acres within the Puget Lowland eco-region of Pierce County, Washington (Ecology, 2006). Elevations throughout the basin are at or just above sea level. Streams in WRIA 12 are low gradient, with underlying topography consisting of rolling glacial outwash and till plains. Sub-basins within WRIA 12 include Clover Creek/Steilacoom, American Lake, Chambers Bay, Tacoma West, and portions of Tacoma. Spanaway and American Lakes are the major lakes within the basin.

2.2 Physical and Ecological Processes

Much of the Town’s marine shoreline is comprised of artificial shoreforms (primarily riprap armoring), and bluff and steep slope backed beaches that historically supplied sediment to the nearshore. The majority of the Town’s marine shoreline is armored by the BNSF revetment, except for the natural beaches within Sunnyside Beach Park and Salter’s Point Beach Park and Chamber’s Bay. Therefore, sediment derived from the erosive bluffs no longer feeds the local beaches, except via the Fifth Street Waterway and Cliff Avenue Waterway (both points where the BNSF railway is on a short trestle over the stream mouths). Chambers Bay shoreline is primarily characterized by artificial shorelines associated with fill and riprap required for construction of Chambers Creek Road and the BNSF Railroad. Several large fill areas have also contributed to changes to the historic character of the Bay. Prior to the construction of the BNSF bridge and causeway, the tide channel that marks the entrance to Chambers Bay was located further landward and was associated with a single barrier that extended northwest across the embayment from the southern shore. The sheltered conditions created by the causeway have reduced wave exposure and wave induced erosion along the bay shorelines, which has altered local littoral sediment transport patterns and sediment supply.

2.3 Habitat and Species

The Puget Sound nearshore environment provides habitat for a variety of aquatic and terrestrial species. The “nearshore” is generally considered to be an area extending from the top of bluffs across the beach and intertidal zone, to the point where light no longer penetrates the Sound’s water. Important features of the nearshore that provide habitat include:

- Marine riparian zones (vegetated bluffs and vegetation overhanging the intertidal zone);
- Bluffs, beaches and backshore (sediment sources, substrate, and storm berms);
- Tidal flats (intertidal or shallow subtidal areas used by juvenile salmonids, shorebirds, and shellfish);
- Eelgrass beds and kelp forests (feeding and rearing habitat for wide variety of marine organisms);
- Tidal marsh and estuarine wetlands; and
- Streams (fish and wildlife corridors and source of fluvial sediment to nearshore).

Within the nearshore environment of the Town of Steilacoom the dominant intertidal habitats include sand and gravel beaches, patchy eelgrass beds, patchy kelp beds, and the pocket estuary at the end of the Fifth Street and Cliff Avenue Waterways. According to WDFW PHS data (WDFW 2009a) the Puget Sound North and South Reaches are associated with multiple priority habitats, including:

- Cliffs / bluffs at the northern most portion of the reach (primarily within the Chambers Bay area); and
- Lagoons (located at the mouth of the Fifth Street Waterway).

According to WDFW streamnet data (WDFW 2009b), the Town's Puget Sound shoreline supports the following fish species:

- Potential forage fish habitat;
- Geoduck beds throughout the reach; and
- Critical habitat for ESA listed salmonids, including Chinook and coho, as well as coastal cutthroat trout (utilizing the Fifth Street Waterway). A collapsed culvert beneath Martin Street was replaced in October 2010, which re-established fish access to the stream.

Additional species and habitats that are supported by the mapped patchy eel grass and kelp beds include: demersal groundfish / bottom-dwelling fish habitat, pelagic groundfish, and sand lance spawning and larvae areas.

2.4 Land Use and Public Access

Current land uses within the Town's shoreline areas are primarily characterized by transportation infrastructure, including the Burlington Northern Santa Fe (BNSF) Railroad right-of-way (ROW) fronting Puget Sound and Chambers Creek Road along the south shore of Chambers Bay. Between BNSF-owned properties within the shoreline area and the railroad ROW, approximately 28% (23 acres) of the Town's shoreline area is controlled by the BNSF railroad (ESA Adolfson, 2011). Additional significant uses include public parks areas (Sunnyside Beach Park, Saltar's Point Beach Park, as well as other park areas), the Steilacoom ferry Landing Facility, currently vacant industrial land, and limited areas of shoreline-related commercial properties. Single-family residential uses extend into the shoreline area landward of the BNSF Railroad ROW.

Public ROW and parks are also significant uses within the shoreline area. Public ROWs are primarily improved roadways (including Chambers Creek Road immediately fronting the shoreline of Chambers Bay and paralleling the BNSF Railroad along the northern portion of the Puget Sound shoreline); however several unimproved ROWs extend into shoreline jurisdiction (primarily running perpendicular to the shoreline through vegetated areas along the BNSF Railroad).

2.5 Altered Ecosystem Processes and Functions

Nearshore ecological processes in the Town of Steilacoom's shoreline planning area have been altered primarily by the BNSF ROW and rail causeway and other "shoreline modifications" related to waterfront development, both within Chamber's Bay and along the Puget Sound shorelines. The rail causeway, consisting of a prism of fill armored with rock, infringes or buries

the upper intertidal beach and backshore along much of the shoreline. It also breaks the connectivity between bluffs and beaches, degrading sediment supply to the nearshore and altering sediment transport and deposition. The rail causeway constrains tidal flow into and out of several embayments within the Town of Steilacoom shoreline including: the mouth of Chamber's Bay, the Fifth Street Waterway and the Cliff Avenue Waterway.

In most areas where there is ample beach waterward or landward of the rail causeway, other shoreline modifications exist. Shoreline modifications refer to structural alterations of the shoreline's natural bank, including riprap, bulkheads, docks, piers or other in-water / overwater structures. Such modifications are typically used to stabilize the shoreline and prevent erosion. The most commonly occurring shore modification is termed shoreline armoring, which typically refers to shore parallel structures such as bulkheads or riprap used to protect coastal property from erosion (Johannessen and MacLennan, 2007). These modifications alter natural process dynamics, leading to beach narrowing, lowering and decreased driftwood abundance (Johannessen and MacLennan, 2007).

Shoreline armoring typically impedes sediment supply to down-drift beaches and nearshore habitats. This sediment starvation can cause or heighten erosion along down-drift shores, and can lead to changes in nearshore substrate composition from sand or mud to coarse sand, gravel, and finally hardpan. This may, in turn, decrease eelgrass abundance, increase kelp abundance, and reduce or eliminate forage fish spawning areas. Construction of shoreline armoring may cover or destroy forage fish spawning areas and eelgrass meadows. Overwater structures may decrease eelgrass cover by depriving it of light. Shore armoring that infringes on intertidal areas can produce a groin-like effect, by impeding alongshore sediment transport on the up-drift side of the structure, resulting in reduced sediment transport (volume) along the down-drift shore.

Dredging can excavate eelgrass or cause excessive turbidity and permanent filling of eelgrass meadows (King County DNR, 2001). Bulkheads and piers may also affect fish life by diverting juvenile salmonids away from shallow shorelines into deeper water, thereby increasing their potential for predation (Nightingale and Simenstad, 2001).

In regard to water quality, the Washington Department of Ecology maintains a list of waterbodies where tested pollutants exceed thresholds established by the state surface water quality standards (WAC 173-201(A)). Section 303(d) of the federal Clean Water Act requires Washington State to periodically prepare a list of all surface waters in the state for which beneficial uses of the water, such as drinking, recreation, aquatic habitat, and industrial use, are impaired by pollutants. This is commonly referred to as the 303(d) list. Waterbodies that do not appear on the 303(d) list may fall short of that pollutant threshold, but may not be free of pollutants. In addition, not all waterbodies are tested as part of this process. Therefore, absence from the 303(d) list does not necessarily indicate that the waterbody is not impaired.

Ecology identifies and reports on tested waterbody segments as they relate to state water quality standards for a variety of parameters, including temperature, pH, dissolved oxygen, metals, etc. Waterbody segments are classified as Category 1, 2, 4, or 5. Category 5 waters are polluted waters that require the establishment of Total Maximum Daily Load (TMDL) limits on the specific pollutant to enter the waterbody from point and non-point sources. The U.S.

Environmental Protection Agency approves the list of Category 5 waters, which represents the state's 303(d) list of impaired waters. Category 4 waters are polluted but do not require a TMDL study (because a TMDL or pollution control plan is already in place or the waterbody is impaired by a non-pollutant such as low streamflow, dams, etc.). Category 2 waters are considered "waters of concern," where pollution is present but may not violate state water quality standards. Category 1 waters meet tested standards for clean waters, but may not be free of all pollutants.

According to the 2008 Washington State Water Quality Assessment (Ecology, 2009), waters and sediment of the Chambers Bay area are not listed on the category 5 (303(d)) list. The vacant West Tacoma Mill property, located landward of Chambers Creek Road within the shoreline area, has documented elevated arsenic levels within the property's groundwater; however the elevated levels of pollutants within the property have not resulted in listing of Chambers Bay.

Chambers Creek, which drains to the bay, has a history of water quality issues, including elevated levels of mercury and copper in one tributary stream. Chambers Creek is listed as a Category 5 water for fecal coliform concentrations. In addition, Chambers Creek contains a Category 4A listing for copper; two Category 2 listings for pH and temperature; and ten Category 1 listings for ammonia-N, arsenic, copper, dissolved oxygen, lead, mercury, pH, total PCBs, zinc, and temperature (Ecology, 2009).

The key issues related to alterations in each shoreline planning segment (as described in the Shoreline Inventory and Characterization Report) are summarized below. The shoreline ecological processes and/or functions that have been impaired or affected as a result of shoreline modifications are also described.

Table 2. Alterations to Ecological Processes and Functions

Shoreline Segment	Shoreline Modifications	Ecological Process / Function Affected
Chamber's Bay	Shore armoring Fill Roads Impervious surfaces Vegetation removal Tidal barrier at mouth of inlet Fish weir at head of inlet Dredging of marina subtidal, BNSF rail causeway, including fill prism/tidal barrier across mouth of Chamber's Bay, Culverted streams.	Sediment supply, transport, and accretion all affected by BNSF revetment (armor and fill), processes also degraded by dredging, fill placement and altered tidal flushing. Tidal hydrology into the bay and stream mouths where culverts and fill constrain openings. Tide channel migration Degraded forage fish spawning habitats, salmonid migratory pathways Marine riparian largely eliminated Reduced water quality Detritus import/export
Puget Sound - North	BNSF rail causeway, including fill prism with rock armor, and tidal barrier across mouth of Chamber's Bay and Fifth Street Waterway Fill and shore armor at Sunnyside Beach, Pier, wharf, boat launch and ferry landing	Sediment supply, transport, and accretion all affected by BNSF revetment (armor and fill), Tidal hydrology into Chamber's Bay and Fifth Street Waterway. Degraded forage fish spawning habitats, and salmonids migratory pathways , Marine riparian vegetation largely eliminated, which also eliminates detritus import/export, Solar radiation (shading of water column).
Puget Sound – South	BNSF rail causeway, including fill prism with rock armor, and tidal barrier across mouth of Cliff Avenue Waterway Culverted stream, Saltar's Point Beach overwater structures.	Sediment supply, transport, and accretion all affected by BNSF revetment (armor and fill), Tidal hydrology into Chamber's Bay and other historic coastal wetlands. Degraded forage fish spawning habitats, and salmonids migratory pathways , Marine riparian vegetation largely eliminated, which also eliminates detritus import/export, Solar radiation (shading of water column).

3.0 RESTORATION PLANNING

3.1 Restoration Framework

A great deal of attention and resources have been focused on Puget Sound restoration activity in recent years. These efforts stem from the listing of Puget Sound salmonid species as threatened and endangered, as well as a more broad awareness and concern for the overall ecological health of Puget Sound. Within the Sound, the nearshore environment – where the land meets the water – is considered a critical element of the Puget Sound ecosystem. The Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) is a multi-agency regional entity whose mission is to protect and restore the functions and natural processes of the Puget Sound nearshore ecosystem. PSNERP has developed strategic principles and concepts intended to guide ecosystem recovery (PSNP, 2004). The principles and concepts, summarized briefly below, provide a framework for the Town of Steilacoom’s shoreline restoration planning.

- **Purpose and Need.** Potential restoration projects should be consistent with overarching goals and objectives.
- **Restoration Principles.** Restoration planning should be strategic and restoration design should be based on carefully developed goals and objectives. Follow-through, or monitoring, should be employed, including development of performance criteria and use of adaptive management in project development.
- **Monitoring Principles.** Three types of monitoring are defined: 1) implementation monitoring to track which potential programs and projects are carried out; 2) effectiveness monitoring to determine if habitat objectives of the program or project have been achieved; and 3) validation monitoring to confirm whether proposed restoration actions are achieving the overall objectives for restoration. Monitoring should be driven by specific questions, goals, and objectives and should be used as the basis for determining if restoration goals are being met. Monitoring should be long-term and interdisciplinary. Another component of monitoring is information management; data should be well documented and available to others.
- **Adaptive Management Principles.** Adaptive management is a process that uses research and monitoring to allow projects to proceed, despite inherent uncertainty and risk regarding its consequences. Adaptive management is best accomplished at a regional or watershed scale, but can be used at a project level to increase knowledge about ecosystems and how they respond to restoration actions.

3.2 Existing Plans and Programs

A number of regional and Puget Sound-wide planning efforts have been developed to address water resource management, water quality, and salmon habitat recovery. These existing plans and programs provide a framework of goals, policies, and in some cases, funding mechanisms. The goals, policies, and actions identified in this restoration plan should coordinate and be

consistent with this broader framework of conservation and restoration work in the Puget Sound region.

3.2.1 Puget Sound Partnership

In 2007 the Washington Legislature passed the Engrossed Substitute Senate Bill 5372, creating the Puget Sound Partnership (PSP), an entity charged with developing and coordinating an environmental agenda for recovery of the health of Puget Sound by the year 2020. The PSP was preceded by the Puget Sound Action Team, which laid the foundation for the work now being undertaken by the PSP. The *2007-2009 Puget Sound Conservation and Recovery Plan* was the last biennial plan produced by the Puget Sound Action Team and continues to guide PSP's work as the 2020 Action Agenda is created (PSP, 2007).

The PSP has identified the following four initial strategic priorities to guide development of the 2020 Action Agenda:

- Ensure that activities and funding are focused on the most urgent and important problems facing the Sound.
- Protect the intact ecosystem processes that sustain Puget Sound.
- Restore ecosystem processes that will sustain Puget Sound.
- Prevent the sources of water pollution.

These recovery efforts have a combined state agency budget of almost \$460 million dollars, which is linked to accomplishing specific goals associated with the core priorities.

3.2.2 Puget Sound Nearshore Ecosystem Restoration Project (PSNERP)

As described above, the Puget Sound Nearshore Ecosystem Restoration Project (PSNERP) is a large-scale, multi-agency initiative to address habitat restoration needs in the Puget Sound basin. Nearshore Project goals are to identify significant ecosystem problems, evaluate potential solutions, and restore and preserve critical nearshore habitat. PSNERP represents a partnership between the U.S. Army Corps of Engineers (Corps), state and federal government organizations, Indian tribes, industries and environmental organizations.

A General Investigation Reconnaissance Study conducted by the U.S. Army Corps of Engineers in 2000 (USACOE, 2000) identified a direct link between healthy nearshore habitat and the physical condition of the shoreline. The study identified several actions that would be central in restoring nearshore processes to a more natural state:

- Providing marshes, mudflats, and beaches with essential sand and gravel materials;
- Removing, moving and modifying artificial structures (bulkheads, rip rap, dikes, tide gates, etc.);

- Using alternative measures to protect shorelines from erosion and flooding; and
- Restoring estuaries and nearshore habitat such as eelgrass beds and kelp beds (USACOE, 2000; PSNP, 2002).

PSNERP also provides outreach and guidance materials related to nearshore ecosystem restoration principals, concepts, and methods of implementation.

PSNERP has identified Chambers Bay as a regionally significant restoration opportunity. Details on conceptual restoration at this location can be found at the PSNERP website under ID #1801.

3.2.3 Shared Strategy for Puget Sound: Puget Sound Salmon Recovery Plan

Shared Strategy for Puget Sound (Shared Strategy) is a collaborative effort between local stakeholders and regional leaders to protect and restore salmon runs across Puget Sound that was initiated as a result of Endangered Species Act (ESA) listings of salmonid species in the Puget Sound region. 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.

Shared Strategy has developed a salmon recovery plan (Shared Strategy, 2007) that provides a blueprint for salmon recovery strategies throughout Puget Sound and incorporates, by reference, local watershed plans for salmon recovery. Amongst other strategies described in the plan, Shared Strategy describes their ‘Top 10 Actions Needed for Salmon Recovery’, many of which have additional beneficial impacts for humans.

Shared Strategy was the non-profit organization that drafted the Puget Sound Salmon Recovery Plan, adopted by NOAA in January 2007. The Puget Sound Partnership took over responsibility for the implementation of the salmon recovery plan in January 2008. NOAA revises this recovery plan each year with an updated 3 Year Work plan for each of the 14 geographic chapters.

3.2.4 Water Resource Inventory Area (WRIA) 12

The Town of Steilacoom is in the Chambers-Clover Watershed: Water Resource Inventory Area (WRIA) 12. The Chambers-Clover Planning Unit completed a draft watershed plan in September 2004, but was unable to reach consensus, and as a result, the plan was not approved.

Pierce County is the Lead Entity agency for salmon recovery in WRIA 10 and 12. The 2010 3-year watershed implementation priorities list for Chambers-Clover Watershed was updated from the 2009 3-year list, with input from project sponsors and the Technical Advisory Group (TAG) and the Citizens Advisory Committee (CAC) of the Pierce County (WRIAs 10 and 12). The 2010 list includes updates for the Chambers Bay Estuarine and Riparian Enhancement and the Chambers Beach Reconstruction and Riparian Enhancement. The Chambers Bay project would involve restoration and enhancement of estuarine and riparian habitat within Chambers Bay through removal of the dam, day-lighting of Garrison Springs, removal of shoreline armor and fill, salt marsh/riparian plantings and addition of woody structure. The Chambers Beach project

would involve reconstruction of a natural beach profile along Chambers Beach through removal of derelict structures, active nourishment of degraded areas and reconstruction of back beach berm where the bank is unstable. Restoration of the riparian corridor through removal of invasive species and planting of native vegetation would also be conducted.

4.0 RESTORATION PRIORITIES AND OPPORTUNITIES

4.1 Restoration Priorities

The Salmon Habitat Protection and Restoration Strategy, WRIA 10 Puyallup Watershed, WRIA 12 Chambers/Clover Creek Watershed (Pierce County, 2008) provides a watershed scale approach to prioritizing restoration efforts. This work is focused on salmon recovery and highlights the restoration of primary estuarine systems (including Chambers Bay) as one of the high priority restorations.

Watershed scale restoration actions can be a long and expensive process, therefore preserving and protecting existing high quality habitat is critical to achieving long term recovery goals. Restoration strategy begins with preserving and protecting existing habitat and areas where shoreline ecological functions are intact. Within this larger watershed context, a preliminary qualitative (high, medium, low) project ranking system is employed when considering restoration opportunities in Steilacoom. This ranking system is applied to the opportunities identified to-date, as described in Table 3 below.

High priority projects will typically:

- a) Address multiple ecosystem processes and/or functions (e.g., habitat and sediment transport process);
- b) Have opportunity for multiple funding sources;
- c) Include freshwater tributary channels and their nearshore estuaries; and/or
- d) Not require additional property acquisition.

Medium priority projects will typically:

- a) Address limited ecosystem functions;
- b) Be eligible for multiple funding sources; and
- c) Require property acquisition or be outside of the Town's control (e.g., UGA).

Low priority projects will typically:

- a) Benefit single ecosystem functions;

- b) Will be used as mitigation to offset impacts elsewhere;
- c) Not be eligible for multiple funding sources; or
- d) Require property acquisition or be outside of the Town's control (e.g., UGA).

4.2 Restoration Opportunities

4.2.1 Programmatic Restoration Opportunities

Certain restoration actions should be broadly and comprehensively implemented on a programmatic basis to help achieve restoration goals. The following programmatic actions are recommended for shorelines within the Town of Steilacoom.

Education and Incentives:

- a) Educate property owners about vegetation/landscape maintenance (including preservation of native vegetation along stream mouths/nearshore riparian corridors) to promote shore stabilization and protect water quality.
- b) Encourage low impact development practices for shoreline property owners.
- c) Educate private property owners about the negative impacts of shore armoring and over-water structures and encourage soft shore protection where shore protection is unavoidable.
- d) Educate recreational boaters about proper waste disposal methods, anchoring techniques, and other best boating practices to minimize habitat damage and prevent water quality contamination.
- e) Where shorelines have been modified, provide incentives to encourage redevelopment activities to include salmonid habitat restoration.

Marine Nearshore:

- a) Develop beach nourishment or landslide side-casting program along shore with rail revetment.
- b) Preserve existing marine riparian areas where functions are intact.
- c) Preserve existing upper beach areas waterward of BNSF ROW. Enhance marine riparian vegetation where adequate area is available.
- d) Remove armoring and bulkheads from publicly owned marine sites including parks, wherever feasible.

- e) Design overwater structures to allow light penetration for protection of aquatic habitat.
- f) Encourage removal of creosote pilings, docks or other contaminants or derelict structures from the nearshore environment. The replacement of pilings that support historic structures listed on the Town’s Register of Historic Places should be exempt from this provision.
- g) Remove derelict vessels from nearshore areas.
- h) Revegetate marine riparian areas where possible. Eradicate invasive species.
- i) Treat storm water prior to flowing into intertidal areas, particularly from impervious surfaces/parking lots.

Infrastructure:

- a) Inspect, maintain, and repair leaking or unauthorized septic systems to prevent nutrient and bacteria loading in streams and bays. Where possible, public sewer systems should be installed to replace on-site septic systems.
- b) Retrofit stormwater systems using Low Impact Development (LID) strategies.

Planning and Coordination:

- a) Match mitigation, including off-site and compensatory mitigation, to appropriate restoration and enhancement activities as identified in salmon recovery, watershed management plans and the SMP restoration plan.
- b) Coordinate SMP restoration with other projects prioritized in WRIA 12.
- c) Improve water quality to provide safe water for swimming by coordinating with Tacoma-Pierce County Health Department and Steilacoom Public Works – Surface Water Management.

4.2.2 Site-specific Restoration Opportunities

Table 3 below summarizes protection and restoration opportunities as described in the Shoreline Inventory and Characterization Report (ESA Adolfson, 2011). The opportunities described are generally considered to be site-specific but may cover many parcels. For example, an opportunity may be appropriate at several locations, but may be implemented on individual parcels over time. Additionally, as shown on Map 1 in Appendix A at the end of this document, specific opportunity areas may apply to more than one location along the shoreline. Table 3 also provides an assessment of the scale and potential length of time required to implement restoration opportunities. For each identified opportunity, the table identifies whether the project is of a short term, medium term, or long term nature. As detailed restoration assessment and prioritization occurs consistent with this plan, the initial assessment of timelines should be re-

focused to create detailed schedules and benchmarks for those actions and areas with the greatest restoration potential.

Short term (ST) (approximately 1-3 years) restoration projects include those that could be implemented by local landowners and volunteers and that would benefit the areas that are most in need. Short term restoration efforts include habitat restoration and enhancement efforts in publically owned areas of the Town's shorelines. These projects could be implemented in the near term, depending on grant cycles and coordination with volunteer and community organizations.

Medium term (MT) (approximately 3-5 years) restoration projects could include those that enhance The Town of Steilacoom shorelines that have been designated or acquired previously. These could also be implemented where there are public access lands that are not likely to be developed in the near future.

Long term (LT) (approximately 5-10 years) restoration projects could be those that require coordination with other jurisdictions or that cover larger land areas. These projects may be more difficult to implement and would likely require more planning and permitting.

Table 3. Restoration Opportunities

Planning Segment	Opportunity Area	Description	Ecological Functions/Processes Addressed	Preliminary Ranking	Timeline
Chamber's Bay	Garrison Creek and Unnamed stream	<p>Enhance culvert at mouth or daylight stream for unnamed stream and Garrison Creek, remove some riprap and adjacent fill where possible, regrade and replant marine riparian vegetation.</p> <p>The Pierce County WRIA 10/12 Lead Entity has developed conceptual plans for restoration of the area including these two streams and Chambers Bay. Additional information on the conceptual plans can be found on the 3-Year Watershed Implementation Priorities Project List website: http://www.co.pierce.wa.us/xml/services/home/environ/water/ps/leadentity/2010/2010WRIA10-12WorkProgramList.pdf</p>	Degraded salmon migratory pathways and lost marine riparian ecotone, detritus import/export. Nearshore habitat (structure) forming processes.	High	LT
	Chamber's Bay thumb	Remove cribbing and piles, regrade, and revegetate and treat stormwater/reduce parking lot footpring along leeward side of Chamber's Bay thumb.	Water quality, derelict material, vegetation loss, detritus import/export, degraded fish habitat	High	MT
	Chamber's Bay thumb	Along waterward side of Chamber's Bay thumb, nourish waterward of bulkhead to restore natural substrate, restore marine riparian buffer.	Habitat loss, degraded fish migratory pathways, vegetation loss, detritus import/export	High	MT
	Chamber's Bay	The PSNERP has identified Chambers Bay as a regionally significant restoration opportunity. Details on conceptual restoration at this location can be found at the PSNERP website under ID #1801.	Habitat loss, degraded fish migratory pathways, vegetation loss, detritus import/export	High	LT

Planning Segment	Opportunity Area	Description	Ecological Functions/Processes Addressed	Preliminary Ranking	Timeline
Puget Sound - North	North of Sunnyside Park	Remove unused rail lines, narrow revetment where possible	Reduce footprint of artificial shoreline, upper intertidal/backshore habitat loss (particularly longterm habitat loss), enhance sediment transport and deposition patterns.	High	LT
	Sunnyside Park	Enhance marine riparian buffer at Sunnyside Park, eradicate invasive species, remove piles from intertidal.	Riparian structure and function, detritus import/export, intertidal habitat forming processes.	Med	MT
	South of Sunnyside Park	Nourish beach south of Sunnyside Park	Mitigate sediment supply loss, increase recreational beach to the south from the park, increase sediment to sustain down-drift spawning habitat.	Med	LT
	Union Ave/Ferry landing	Reduce impact of overwater structures (using grating and reduce pile density and use of creosote) where possible. If dredged, consider sediment by-passing around dredge footprint.	Shaded water column (solar radiation), sediment transport, deposition.	Med	MT
	Fifth Avenue Waterway	North shore, waterward of BNSF ROW. Expand causeway/inlet opening where possible.	Buried beach substrate, constrained tidal flushing.	Med	LT

Planning Segment	Opportunity Area	Description	Ecological Functions/Processes Addressed	Preliminary Ranking	Timeline
	Fifth Avenue Waterway	North shore, landward of BNSF ROW. Remove fill infringing on intertidal, armor and possible creosote.	Buried beach substrate, cross-shore connectivity, sediment supply, transport and deposition, detritus import/export.	Med	LT
	Fifth Avenue Waterway	South shore, landward of BNSF ROW. Remove fill and surrounding armor, reduce impact of overwater structures where possible.	Buried beach substrate, cross-shore connectivity, sediment supply, transport and deposition, detritus import/export.	Med	LT
Puget Sound – South	Saltar’s Point Beach	Remove debris, piles, nourish beneath footprint of structure to recover natural beach profile and substrate, revegetate marine riparian.	Buried beach substrate, shaded water column, sediment transport and deposition, riparian vegetation.	High	MT
	South of Saltar’s Point	Nourish beach north of Cliff Avenue Waterway. Revegetate marine riparian.	Mitigate sediment supply loss, sediment supply, deposition, marine riparian vegetation loss, detritus import/export.	Med	MT
	Cliff Avenue Waterway	Enhance riparian buffer, remove derelict structures.	Riparian vegetation loss, detritus import and export.	Med	MT

Planning Segment	Opportunity Area	Description	Ecological Functions/Processes Addressed	Preliminary Ranking	Timeline
	South of Cliff Avenue Waterway	Nourish beach between Cliff Avenue Waterway and south Steilacoom	Mitigate sediment supply loss, sediment supply, deposition, marine riparian vegetation loss, detritus import/export.	Med	MT
	South of Cliff Avenue Waterway	Improve culvert at perennial stream.	Tidal flow into perennial stream mouth, fish habitat degradation, detritus import/export.	Med	MT

4.3 Existing Capital Improvement Projects

In addition to the opportunities described above, the Town and Pierce County are already initiating and planning several capital improvement projects near the shoreline. Some projects incorporate restoration elements directly, while others may provide an opportunity for restoration coupled with the design and implementation of the primary capital improvement (Table 4).

Table 4. Existing Capital Improvement Projects

Project	Projected Year	Cost	Primary Funding Source	Status and Shoreline Benefits
Fifth Street Waterway Culvert replacement at Martin Street	2010	\$1,115,500	Town funds	<i>Completed</i> Repaired collapsed culvert. Improved riparian connection to the shoreline.
Steilacoom Ferry Terminal Remodel (Pierce County PW)	2011 -2012	\$307,250	County funds	<i>Completed.</i> No shoreline benefits
Chambers Street Stormwater outfall replacement	2017	\$770,000	Town funds	Planned. Improve nearshore environment

5.0 POLICY DEVELOPMENT

Given the nature and scale of alterations to the Puget Sound nearshore in The Town of Steilacoom and its UGA, it is important that the Town work with other regional entities to pursue significant restoration opportunities. While the Town may be able to pursue some restoration or enhancement opportunities without regional partners, these types of projects will typically be smaller scale, lower priority actions (e.g., native plantings).

Five general policies have been identified that the Town could adopt to promote the goal of restoring ecosystem function within the Puget Sound nearshore ecosystem. The policies are not listed in order or priority.

Policy 1. Identify specific restoration opportunities where the Town can support or work with another lead agency.

Intent: Encourage the Town to support restoration efforts throughout the watershed and throughout its UGA.

Policy 2. Identify specific restoration opportunities where the Town can take the lead with support from other regional entities.

Intent: Encourage the identification of high-priority restoration projects which the Town can lead. Such projects may be smaller scale or address site-specific habitat improvements within the context of larger ecosystem restoration efforts.

Policy 3. Incorporate habitat enhancement elements into the design and implementation of public infrastructure improvement projects.

Intent: Lead by example by incorporating culvert replacements, bulkhead replacements, riparian plantings, and other habitat enhancement measures into publicly funded projects that are located or pass through the nearshore environment.

Policy 4. Use this restoration framework to integrate compensatory mitigation projects into the broader restoration vision for the Town.

Intent: Recognize that future development allowed under the SMP may have unavoidable adverse impacts to shoreline functions. In those cases, the restoration planning element of the SMP should help inform development of appropriate mitigation for those adverse impacts.

Policy 5. Educate landowners and encourage public involvement in the restoration of the shoreline.

Intent: Provide outreach and technical support to shoreline landowners to better inform and support voluntary restoration of native vegetation and alternative bank stabilization techniques on private property. Present effective stormwater management techniques to landowners to help improve the water quality of Puget Sound. These techniques would be provided during the Town's administration of the Phase 2 National Pollution Discharge Elimination System (NPDES) permit. This policy is also intended to provide opportunities for the citizens of Steilacoom to take part in, and learn about, the restoration of the Town's shorelines. Example events could include: clean-up days, invasive species removal, native plantings, monitoring projects, and low impact development techniques.

Policy 6. Improve water quality in the Town of Steilacoom through the use of low impact development techniques; vegetation restoration; treatment and removal of hazardous materials; and stormwater management, and improved sanitary sewage pump-out facilities for recreational boaters.

Intent: Encourage developers and property owners to utilize the low impact development techniques in the Town of Steilacoom Stormwater Management and Site Development Manual, and provide increased access to sanitary sewage pump-out facilities for recreational boaters.

6.0 IMPLEMENTATION

6.1 Funding and Partnership Opportunities

Funding opportunities for restoration projects include both federal and state grants and legislative funds administered by state agencies. For potential projects in the Town of Steilacoom, the greatest likelihood of obtaining funding would result from participation in the South Central Action Area local integrating organizations and/or strategic partnering with Pierce County and state and federal agencies. Targeting funding requests to address bulkhead replacement with soft-shore alternative bank stabilization projects would fit well into the scientific and restoration plans/goals of the organizations listed below. There are also opportunities to partner with non-profit organizations that can help to secure grant funding and recruit volunteers. A few of these programs and organizations most relevant to the Town of Steilacoom are described below.

6.1.1 State and Regional Programs

6.1.1.1 *Puget Sound Partnership (PSP)*

The state legislature has appropriated a total of \$460 million for state agencies and university education programs for implementing the *2020 Action Agenda*. The Town of Steilacoom falls within the South Central Action Area, one of seven action areas identified by PSP.

6.1.1.2 *Puget Sound Watershed Protection & Restoration Grant Program*

The Environmental Protection Agency through the Washington Department of Ecology is offering watershed grants to applicants within the 14 Puget Sound Salmon Recovery Planning Areas. The South Central Action Area Council would be the recipient of these funds, coordinated by the Puget Sound Partnership. Local governments, tribes, watershed entities and non-profit groups are eligible for these grants. The focus of the grants is to identify opportunities and barriers for the protection and restoration of water quality, water quantity, habitat protection and habitat restoration within the Puget Sound Basin.

6.1.1.3 *Salmon Recovery Funding Board (SRFB)*

With the listing of salmonid species under the Endangered Species Act in 1999, the Legislature created the Salmon Recovery Funding Board. Composed of citizens appointed by the Governor and five state agency directors, the Board provides grant funds to protect or restore salmon habitat and assist related activities. The SRFB works closely with local watershed groups and has helped finance over 500 projects.

6.1.1.4 *South Puget Sound Salmon Enhancement Group*

The South Puget Sound Salmon Enhancement Group is a 501(c)(3) non-profit organization that works to protect and restore South Puget Sound salmon populations and aquatic habitat through

scientifically informed projects, community education, and volunteer involvement. The group works in cooperation with landowners and other organizations to help plan, fund, carry out, and monitor fishery enhancement and habitat restoration projects. Over 100 projects have been completed since the group formed in 1990.

The Washington State Legislature formed salmon enhancement groups in 1990 as a means of directly involving communities, citizen volunteers, and landowners in salmon recovery. Enhancement groups are funded by surcharges on sport and commercial fishing licenses and the sale of eggs and carcasses from state hatcheries.

6.1.2 Pierce County Programs

6.1.2.1 Conservation Futures Program

Conservation Futures is a Pierce County land preservation program intended to protect open space, timber lands, wetlands, critical habitats, and farm lands within the county. This program is funded through a State authorized county property tax. Taxes collected, identified as Conservation Futures, are used to acquire land, or the rights to future development of lands, for conservation purposes. Lands identified in the Steilacoom SMP as future restoration or conservation sites can be nominated by the Town, or an agency, for purchase through this County-sponsored program.

6.1.2.2 Open Space-Public Benefit Rating System-Tax Program

Pierce County's Public Benefit Rating System (PBRs) provides for a reduction in property taxes for lands containing various open space features, such as streams, wetlands, estuaries, wooded areas, etc. These features are scored and the number of PBRs points correlates to a percent of market value reduction during the period of continued eligibility. This program can help property owners conserve ecologically important areas while reducing their tax burden. (http://www.co.pierce.wa.us/pc/abtus/ourorg/at/open_space.htm)

6.1.3 Other Non-profit Organizations

6.1.3.1 Cascade Land Conservancy

Cascade Land Conservancy is a non-profit organization working to conserve land in Pierce, King, Mason, Kittitas, and Snohomish Counties. The Conservancy has led the conservation of more than 150,000 acres over the last decade including approximately 20 properties in Pierce County. The Conservancy works with landowners using tools such as land purchase or donation, conservation easements, and stewardship endowments to preserve high-quality ecosystems. (<http://www.cascadeland.org/>)

6.1.3.2 Friends of Pierce County

Friends of Pierce County is a nonprofit organization that involves the people of Pierce County in preserving and restoring the natural environment and promotes more livable communities. The

organization seeks to serve as an interactive link coordinating communities, business, government, and other entities; educate and empower communities through public outreach; direct growth of community attributes that promote a sensible and sustainable balance of environment, equity, and economics; preserve and restore the natural ecosystem; promote livable communities with linked and shared resources; and advocate for responsible and adaptive land use and transportation planning, watershed planning and natural resource management, and environmentally friendly techniques, and policies. (<http://www.friendsofpiercecounty.org/about.htm>)

6.1.3.3 National Fish and Wildlife Foundation

The National Fish and Wildlife Foundation (NFWF) distributes grants to non-profit organizations, local, state or federal government agencies for community-based projects that improve and restore native salmon habitat, remove barriers to fish passage, or for the acquisition of land/ conservation easements on private lands where the habitat is critical to salmon species. NFWF has established local partnerships throughout Washington State through the Community Salmon Fund program to engage landowners, community groups, tribes, and businesses in stimulating smaller-scale, community-oriented habitat restoration and protection projects to aid in salmon recovery. Grants made under this program are administered by NFWF. There are currently three Community Salmon Fund partnership programs. NFWF has partnered with the Washington State Salmon Recovery Funding Board (SRFB) to administer a statewide Community Salmon Fund program that is coordinated with the individual Lead Entity groups. In addition to this SRFB Community Salmon Fund program, NFWF has partnered with both King and Pierce Counties to administer county-specific Community Salmon Fund programs in those counties. (www.nfwf.org/)

6.1.3.4 People for Puget Sound

People for Puget Sound is a non-profit organization founded in 1991 to protect the health of Puget Sound. Key programs address community-based restoration, oil spill prevention, stormwater management, toxics, septic systems, public involvement and education. People for Puget Sound has worked with thousands of volunteers to restore over 40 miles of shoreline and 20 salt marshes, beaches, and estuaries. (<http://pugetsound.org/>)

6.1.3.5 Pierce County Biodiversity Alliance

The Pierce County Biodiversity Alliance includes a cross-section of conservation agencies and organizations that share an interest in conserving the biodiversity of Pierce County. The Alliance includes Pierce County Planning and Land Services, Washington Department of Fish and Wildlife, University of Washington, Cooperative Fish & Wildlife Unit, Metro Parks Tacoma, National Wildlife Federation, Puyallup River Watershed Council, Pierce County Conservation District, Crescent Valley Alliance (CVA), and Friends of the Lower White River (FLWR).

The Alliance has identified a Biodiversity Network of 16 biologically rich areas known as “biodiversity management areas” and connecting corridors (buffered connectors) that cover nearly 268,000 acres of land. The Puget Sound shoreline of Steilacoom is included in the

buffered connector mapping. Landowners in Pierce County BMAs are eligible for reduced property taxes. The Alliance has involved landowners and citizens in learning and stewardship through rapid biological inventory (BioBlitz), data collection (NatureMapping), and community planning. (http://www.biodiversity.wa.gov/ourbiodiversity/updatewhite_river.html)

6.1.4 Other Possible Funding Sources

- a) Aquatic Lands Enhancement Account – WA Department of Natural Resources
- b) Aquatic Lands Restoration Funding – WA Department of Natural Resources
- c) Bring Back the Natives – National Fish and Wildlife Foundation
- d) Coastal Protection Account – WA Department of Ecology
- e) Community-Based Restoration Program - NOAA
- f) City Fish Passage Barrier, Stormwater and Habitat Restoration Grant Program - WA Department of Transportation
- g) Embrace-A-Stream – Trout Unlimited
- h) Estuary and Salmon Restoration Program (ESRP) – Puget Sound Nearshore Ecosystem Restoration Project
- i) Five-Star Restoration Program - Environmental Protection Agency
- j) Habitat Conservation - U.S. Fish and Wildlife Service Coastal Program
- k) Landowner Incentive Program – Washington Department of Fish and Wildlife
- l) Matching Aid to Restore States Habitat (MARSH) - Ducks Unlimited
- m) Non-point Source Implementation Grant (319) Program, Centennial Clean Water Fund, and State Revolving Loan Fund - Environmental Protection Agency, WA State Department of Ecology
- n) Pacific Grassroots Salmon Initiative - National Fish & Wildlife Foundation
- o) Partners for Fish and Wildlife – U.S. Fish & Wildlife Service
- p) Puget Sound Program - U.S. Fish & Wildlife Service
- q) Puget Sound Wetland Restoration Program - Washington State Department of Ecology
- r) Section 206: Aquatic Ecosystem Restoration Program - U.S. Army Corps of Engineers
- s) Transportation Equity Act for the 21st Century (TEA-21) - Washington Department of Transportation

- t) Washington State Ecosystems Conservation Program - U.S. Fish and Wildlife Service
- u) Washington Wildlife Recreation Program – Interagency Committee for Outdoor Recreation
- v) Wetland Protection, Restoration, and Stewardship Discretionary Funding - Environmental Protection Agency

6.2 Approach for Public Outreach

Public education and involvement in restoration efforts is essential when implementing programmatic and site-specific opportunities located on privately-owned property. The Town could consider using the public education and outreach requirement of the Town's National Pollutant Discharge Elimination System (NPDES) Phase 2 Municipal Stormwater Permit to reach out to the community. The NPDES permit requires an education program be put into place that is aimed at residents, businesses, industries, elected officials, policy makers, and planning staff. The goal of the program is to reduce or eliminate behaviors that cause or contribute to adverse stormwater impacts. The following are subject areas required to be in the program which could relate to the protection and restoration of shoreline areas:

- Impacts from impervious surfaces
- Source control BMPs and environmental stewardship actions and opportunities in the areas of pet waste, vehicle maintenance, landscaping and buffers.
- BMPs for use and storage of pesticides and fertilizers.
- Low Impact Development techniques, including site design, pervious paving, retention of forests and mature trees.

When preparing the program that addresses these subject areas, the Town could incorporate information that relates to shoreline restoration, specifically as it relates to improving water quality. Public outreach for subject areas that do not relate to stormwater impacts would have to be conducted outside the NPDES program. However, the approach used for the NPDES program could be similarly applied and implemented to ensure efficient use of Town staff resources.

6.3 Timelines, Benchmarks, and Strategies for Effectiveness

In the context of the SMP update, restoration planning is a long-term effort. As stated earlier, the SMP guidelines include the general goal that local master programs “include planning elements that, when implemented, serve to improve the overall condition of habitat and resources within the shoreline area” (WAC 173-26-201(c)). The guidelines for restoration planning state that local programs should “...appropriately review the effectiveness of the projects and programs in meeting the overall restoration goals” (WAC 173-26-201(2)(f)). The Puget Sound Nearshore Partnership restoration framework described previously (PSNP, 2004) provides a general roadmap for assessing restoration actions and revising the approach to meeting restoration goals. It includes the following objectives:

- Monitor post-restoration conditions;
- Adaptively manage restoration projects; and
- Use monitoring and maintenance results to inform future restoration activities.

As a long-range policy plan, it is difficult to establish meaningful timelines and measurable benchmarks in the SMP by which to evaluate the effectiveness of restoration planning or actions. Nonetheless, the legislature has provided an overall timeframe for future amendments to the SMP. In 2003, Substitute Senate Bill 6012 amended the Shoreline Management Act (RCW 90.58.080) to establish an amendment schedule for all jurisdictions in the state. Once the Town of Steilacoom updates its SMP, the Town is required to review, and amend if necessary, its SMP once every seven years (RCW 90.58.080(4)). During this review period, the Town could document progress toward achieving shoreline restoration goals. The review could include:

- Re-evaluating adopted restoration goals, objectives, and policies;
- Summarizing both planning efforts (including application for and securing grant funds) and on-the-ground actions undertaken in the interim to meet those goals; and
- Revising the SMP restoration planning element to reflect changes in priorities or objectives.

Another mechanism that may serve to establish timelines and benchmarks would be establishment of a shoreline restoration program organized like or integrated with the Town’s capital improvement program (CIP). Similar to an infrastructure CIP, a shoreline restoration CIP would be evaluated and updated regularly. The shoreline CIP would be focused on site-specific projects and could be funded through grants or a fee-in-lieu program developed as part of the shoreline permitting process. Further, other CIP projects, such as stormwater facility improvements, could be evaluated to determine if their design could advance shoreline restoration goals.

Finally, the Town could develop performance criteria for monitoring shoreline restoration and mitigation projects. A GIS-based database to document and track projects could be developed as well. This would assist in future evaluations (once every seven years) of the SMP program in terms of meeting restoration and “no-net-loss” goals.

6.4 Constraints to Implementation

There are a number of potential complicating factors between the development of a town-wide shoreline restoration plan and on-the-ground implementation of its programs and projects. Some of these challenges are briefly summarized below:

- a) Lack of funding: Designing, carrying out, and monitoring the success of restoration efforts can be an expensive undertaking, particularly at larger (e.g., watershed or reach) scales. In general, funding for restoration is limited and competition for funds extensive.
- b) Landowner participation: Restoration opportunities which are located on private property can be more challenging to implement than opportunities located on public property. The property owners would need to be interested in working with the Town since restoration is not a regulatory requirement. Property owners would need to fund and complete the projects on their own, or if public funding were available the Town would have to negotiate with the private property owners to purchase the property or an easement on the property to accomplish the project. Such voluntary interest may not occur until shoreline landowners are educated on the benefits of restoration projects or meaningful incentives are established.
- c) Urban Growth Area: Restoration opportunities which are located in the UGA pose a challenge to the Town since it has no authority with those properties. When pursuing a restoration project the Town would need to coordinate with Pierce County on the permitting process. Another option would be to wait until properties in the UGA are annexed into the town before implementing a project.
- d) Project permitting: Obtaining necessary permits from local, state, and federal regulatory agencies can require substantial time and effort. Although encouraged and allowed by the SMP, complicated restoration projects may take a year or more to permit.
- e) Climate change: Rising temperatures and sea levels have the potential to dramatically impact the Town of Steilacoom's shoreline jurisdiction, processes, and functions over time. Depending on the scale of change and time period over which changes occur, restoration priorities could shift substantially within a relatively short period of time. Beach nourishment will be required to prevent habitat loss due to the coastal squeeze along all armored shores. Relocating the rail causeway may be necessary to preserve the nearshore food web and control costs associated with engineering and intertidal revetment. Future restoration should be designed to consider sea level rise and future water elevations in shoreline areas of Steilacoom.

7.0 CONCLUSIONS

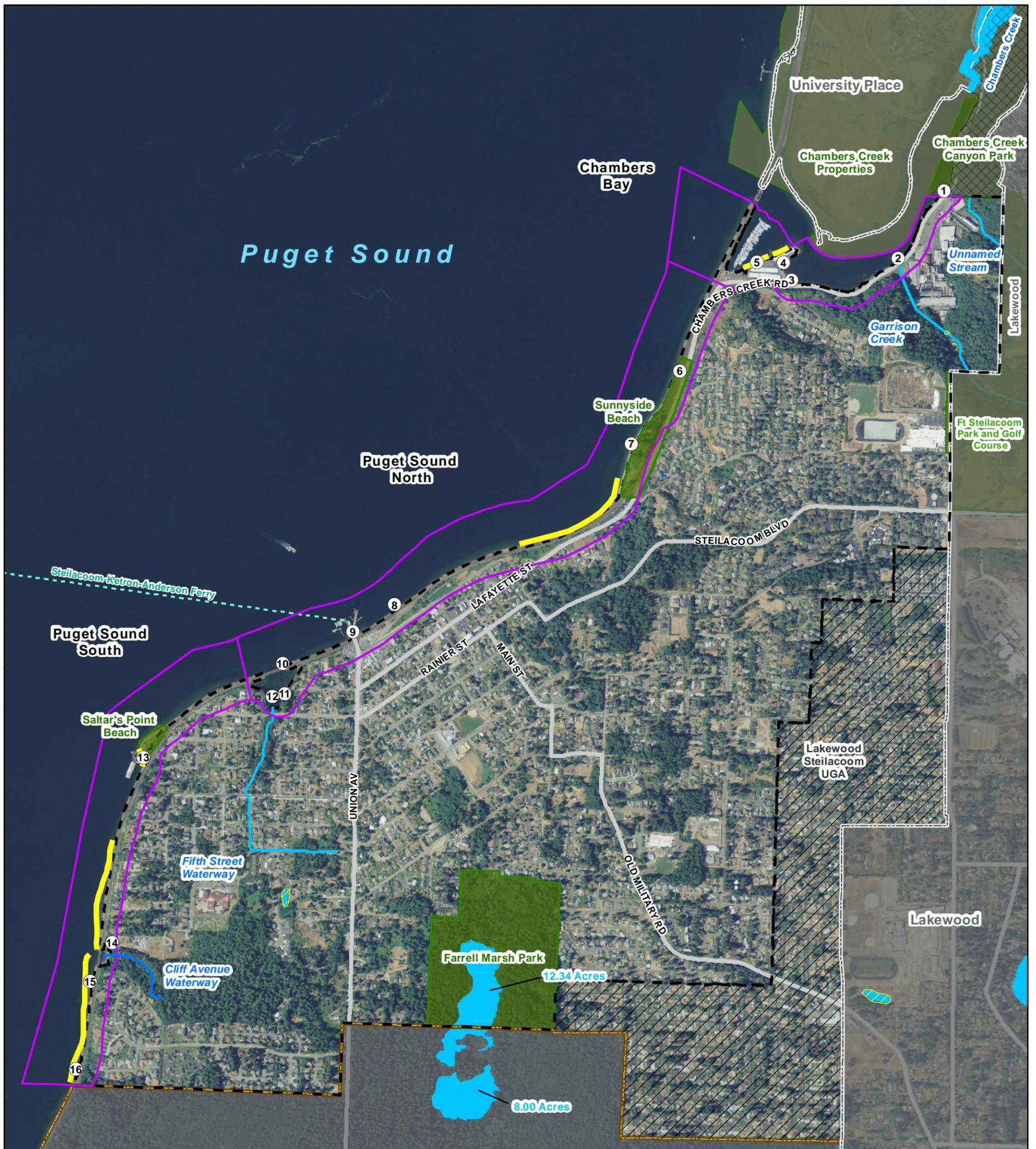
The Town of Steilacoom’s shorelines have been altered and developed to varying degrees throughout the Town. The BNSF Railroad grade represents the largest constraint to restoration within the shoreline environment. However, the shorelines still maintain ecological processes and provide important habitat functions to a variety of fish and wildlife species.

The SMP guidelines require that local governments develop SMP policies that promote “restoration” of impaired shoreline ecological functions and a “real and meaningful” strategy to implement restoration objectives. Recent restoration efforts by the Town have improved some shoreline functions. The Town recently completed a high priority restoration by replacing the culvert under on the Fifth Street Waterway under Martin Street. Additional restoration opportunities identified in this report include both short and long-term restoration projects of high to low priority. Higher priority projects that will restore shoreline functions within the Town will likely require grant funding, voluntary participation in the restoration action, and public outreach and education efforts.

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**APPENDIX A:
RESTORATION OPPORTUNITIES MAP**



Id Restoration Opportunity

- | | |
|--|---|
| 1 Replace culvert, remove riprap & adjacent fill, enhance riparian | 9 Enhance conditions of boat launch |
| 2 Enhance stream mouth, nourish, riparian planting, daylight? | 10 Remove toppled armor and debris, expand causeway/inlet opening |
| 3 Remove cribbing & piles, regrade, nourish, reveg riparian | 11 Remove armored fill area and surrounding rock |
| 4 Plant marine riparian buffer along entire shore and landward | 12 Remove fill, armor and any possible creosote |
| 5 Enhance marine riparian buffer, nourish waterward, reduce plot footprint | 13 Debris and pile removal, revegetate marine riparian ecotone |
| 6 Remove any unneeded rail lines and narrow revetment | 14 Enhance riparian buffer, remove any derelict structures |
| 7 Enhance marine riparian buffer, remove piles, eradicate invasives | 15 Remove rock in intertidal |
| 8 Remove toppled armor from beach and restack | 16 Improve culvert at perennial stream |

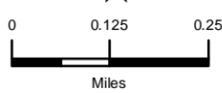
SHORELINE MASTER PROGRAM UPDATE: TOWN OF STEILACOOM

Map 1: Beach Nourishment and Restoration Opportunities




Legend

 Shoreline Planning Area	 Steilacoom Town Limits	 Restoration Opportunities
 Reach Breaks	 Steilacoom Lakewood UGA	 Beach Nourishment
 Streams	 Unincorporated Pierce County	 Ferry Route
 Waterbodies	 Major Roads	 Parks

SOURCE: CGS, 2011;
ESA Adolfson, 2009;
FEMA, 2007; Pierce County, 2007,
2009; WDNR, 2000, 2009; NAIP
(USDA), 2009 (Aerial).

SMA Grant No. G1000015

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This map depicts the approximate location and extent of areas subject to the SMP. The actual extent of shoreline jurisdiction requires a site-specific evaluation to identify the ordinary high water line and any associated wetlands. Wetland locations are approximate and based on existing County inventory; additional wetlands may be present that are not shown on the map and some of the areas shown as wetland may not meet the wetland criteria. This map makes no claim as to whether wetlands are associated with the shoreline or not.