

# **CITY OF BURIEN SHORELINE MASTER PROGRAM**

## **RESTORATION PLAN**

PREPARED FOR:

**CITY OF BURIEN**  
DEPARTMENT OF COMMUNITY DEVELOPMENT  
15811 AMBAUM BLVD SW STE C  
BURIEN, WASHINGTON 98166-3066

SUBMITTED TO:

**REID MIDDLETON, INC.**  
728 134TH STREET SW, SUITE 200  
EVERETT, WA 98204

PREPARED BY:

**GRETTE ASSOCIATES, LLC**  
2102 NORTH 30<sup>TH</sup> SUITE A  
TACOMA, WASHINGTON 98403  
(253) 573-9300

151 SOUTH WORTHEN, SUITE 101  
WENATCHEE, WASHINGTON 98801  
(509) 633-6300

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# 1 INTRODUCTION

This report is intended meet the requirements of Restoration Planning component of the City of Burien's (City's) Shoreline Master Program (SMP) update. It builds upon other elements, draft or final, of the City's SMP update completed to date including the draft Shoreline Inventory (March 2008, revised October 2008) (Grette Associates 2008a) and Shoreline Analysis and Characterization (June 2008, revised October 2008) (Grette Associates 2008b). The report is organized in such a way that it clearly follows Ecology's guidance for Restoration Planning, based on WAC 173-26-201 (2) F, which is presented below in *italics* for reference:

*[WAC 173-26-201 (2)] F. Shoreline restoration planning. Consistent with principle WAC 173-26-186 (8)(c), master programs shall include goals, policies and actions for restoration of impaired shoreline ecological functions. These master program 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. The approach to restoration planning may vary significantly among local jurisdictions, depending on:*

- The size of the jurisdiction;*
- The extent and condition of shorelines in the jurisdiction;*
- The availability of grants, volunteer programs or other tools for restoration; and*
- The nature of the ecological functions to be addressed by restoration planning.*

*Master program restoration plans shall consider and address the following subjects:*

- (i) Identify degraded areas, impaired ecological functions, and sites with potential for ecological 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.*

## 1.1 RESTORATION PLANNING AND THE BUILT ENVIRONMENT

It is important to approach SMP-mandated Restoration Planning using the definitions for restoration provided for that purpose in the WAC, as it is different from definitions that exist in other regulatory realms (e.g., critical areas regulations, federal Clean Water Act). WAC 173-026-020 (27) reads: "*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.* Under this definition, restoration includes actions which improve degraded shoreline processes or functions and does not require a complete reversal to pre-development conditions. This is important, particularly in built environments such as the City of Burien where reestablishment of pre-development processes and functions may not be feasible. There are substantial constraints in terms of property ownership and development condition for the vast-majority of Burien's shorelines. In this case, the incremental benefits of smaller-scale actions, such as shoreline revegetation or structure removal on the scale of individual residential lots, must be acknowledged. There is added benefit to these smaller scale actions where the science addressing larger processes and functions within shoreline environments can inform their relative benefits, for instance restoring sediment transport to potential forage fish spawning areas.

The approach of this document is to consider all previously identified restoration opportunities within the context of both the built environment and the available science informing shoreline processes and function, building directly on the Inventory (Grette Associates 2008a) and Analysis and Characterization (Grette Associates 2008b) already prepared as part of this SMP update. Note that although this document is not organized by sections according to SMP reach (Table 1), reach is used as a descriptor for each restoration opportunity.

**Table 1. Shoreline inventory reaches in the City of Burien.**

Location	Reach	Description	Approximate Length (ft)	Approximate Length (mi)
Marine	M1	Primarily residential marine shoreline extending south from City limit to the north edge of Seahurst Park.	6,001	1.14
Marine	M2	Seahurst Park and primarily undeveloped shoreline south to the point at which consistent shoreline residential development begins again. Corresponds to a line projected west from SW 149 <sup>th</sup> Street to intersection with the shoreline.	6,382	1.21
Marine	M3	Consistent residential development extending south to the tip of Three Tree Point.	9,246	1.75
Marine	M4	Consistent residential development from the tip of Three Tree Point to the southern City limit.	7,597	1.44
		<i>Marine Subtotal</i>	<b>29,226</b>	<b>5.54</b>
Lake Burien	LB	Entire perimeter of Lake Burien	6,172	1.17
		<b>Total Jurisdictional Shoreline</b>	<b>35,429</b>	<b>6.71</b>

## 1.2 REPORT ORGANIZATION

This document is organized as follows. First, the overall goals and priorities as described earlier in the SMP process are described (Section 2). This is followed by a detailed discussion of the ongoing restoration and conservation activities within City shorelines, namely Seahurst Park and Eagle Landing Park (Section 3). Other areas identified as degraded or impaired under the Inventory (Grette Associates 2008 a), and Analysis and Characterization (Grette Associates 2008 b) are summarized in Section 4, along with discussion of restoration and/or conservation measures to address them.

Because this document is not explicitly organized around the six required subjects identified under WAC 173-26-201 (2) F (see page 1), Table 2 provides a summary of how this restoration maintains consistency with those requirements.

**Table 2. Consistency with WAC 173-26-201 (2) F.**

<b>Restoration Plan Requirement</b>	<b>How and where addressed</b>
(i) Identify degraded areas, impaired ecological functions, and sites with potential for ecological restoration;	For Seahurst Park and Eagle Landing, described in Section 3. For all others summarized from Inventory (Grette Associates 2008 a) and Analysis and Characterization (Grette Associates 2008 b) in Section 3 (Table 3).
(ii) Establish overall goals and priorities for restoration of degraded areas and impaired ecological functions;	Already completed under SMP process, provided in Section 2.
(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;	Applies only to Seahurst Park and Eagle Park activities as described in Section 3.
(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;	Summarized from Inventory (Grette Associates 2008 a) and Analysis and Characterization (Grette Associates 2008 b) and expanded upon in Section 4 (Table 3). Potential funding sources identified in Section 4 (Table 4).
(v) Identify timelines and benchmarks for implementing restoration projects and programs and achieving local restoration goals;	Seahurst and Eagle Landing Parks as described in Section 3; other restoration opportunities are not yet well enough defined for detailed planning.
(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.	Seahurst and Eagle Landing Parks as described in Section 3; other restoration opportunities are not yet well enough defined for detailed planning.

## 2 GOALS AND POLICIES

The City's Shoreline Advisory Committee (SAC) has approved the following goal and associated policies for the restoration element of the SMP update, as of November 5, 2008.

### Goal

Restore areas which are ecologically degraded to the greatest extent feasible while maintaining appropriate use of the shoreline

### Policies

- Promote restoration actions that are doable, practical, and effective.
- The City shall be a good steward of public lands and should integrate restoration and/or enhancement of fish and wildlife habitats into capital improvement projects whenever feasible.
- For new development or redevelopment activities in the shoreline, establish incentives that provide opportunities to restore impaired ecological functions and processes. Incentives might include, but are not limited to: flexible development standards (e.g., setbacks, height limits, lot coverage), reduced or waiver of permit fees, and tax relief.
- The City shall promote voluntary shoreline enhancement projects through educational and incentive programs for individuals and organizations.
- The City should implement the restoration plan associated with this Shoreline Master Program.
- Improve natural stream and shoreline conditions to an environmental quality level that supports the return and continuation of salmon runs.
- Eliminate fish blockages.
- Stream banks and stream channels should be maintained or restored to their natural conditions wherever such conditions or opportunities exist.
- Increase availability of large woody debris and opportunities for recruitment in the nearshore zone.
- Restore degraded shoreline areas with native species.
- The City should investigate partnerships with local environmental groups, city, state, or county agencies, or tribes to implement projects and conduct follow-up monitoring and reporting.
- Project monitoring should be required for any action which is undertaken as mitigation for development impacts.

### 3 EXISTING AND ONGOING RESTORATION PROGRAMS

#### 3.1 SEAHURST PARK

The vast majority of existing and ongoing shoreline restoration efforts within the City has been focused on, and are currently planned for, Seahurst Park. The park provides nearly one mile of Puget Sound shoreline, habitat for rearing salmonids, including Chinook salmon. The park contained a sea-wall or bulkhead, constructed in the 1970s. Since that time, beach elevations in Seahurst Park have dropped three to four feet due to wave scouring and the disconnection of the beach from primary sediment sources. These changes had significantly degraded habitat quality for salmon and the organisms they depend on, particularly forage fish.

The Seahurst Park Master Plan (Anchor 2002) described specific restoration opportunities within Seahurst Park (located in Reach M2). The plan proposed to preserve all the existing undeveloped area, increase the natural habitat area and function through extensive restoration and land acquisitions. The plan describes that sustaining and restoring the marine shoreline at Seahurst Park is based on four concepts: removing existing shoreline protection structures; modeling restored beach slopes and substrates after natural conditions; replenishing gravel and sand lost to erosion; and restoring and protecting the natural delivery paths of sediment to the beach. Since adoption of the Master Plan, the City has added an additional concept: to preserve existing functioning nearshore habitats including unstable forested bluffs, eelgrass beds, and stream deltas. These concepts now form a five-pronged strategy for the City to restore and protect nearshore habitats and restore habitat forming processes (S. Roemer, City of Burien Parks Planner).

As part of implementation of the master plan, the long seawall reach south of the south park entrance was removed and the beach reshaped to a more natural shoreline state, including the addition of native vegetation and large longshore wood placement. The Seahurst Park Bulkhead Removal and Beach Restoration Project was constructed between November 2004 and February 2005 made possible by funding from the City (\$190,500), the state and the \$190,500 funded by the state Salmon Recovery Funding Board (\$190,500), and \$707,000 from the U.S. Army Corps of Engineers. The project included removal of about 1,400 feet of failing seawall (including approximately 8,200 cubic yards of gabion and toe stone in addition to fill materials); and installation of approximately 9,350 cubic yards of washed gravels and coarse sand to mimic slope and surface substrates at reference beaches. Volunteers and contractors together installed over 8,300 trees, shrubs, groundcovers, and dune grasses as part of revegetation efforts.

The project goal is to restore self-sustaining nearshore habitat and ecological processes to avoid the need for on-going human intervention. Through reconnecting the sediment supply, the beach will now be naturally replenished. A series of pre-project monitoring reports were prepared to document baseline conditions for topics such as beach topography, eelgrass, benthic invertebrates, and forage fish use. Monitoring at Seahurst Park was mostly funded by grants. The monitoring reports also established post-restoration monitoring to quantify and evaluate the benefits from the project.



Before and after photos from the project (compliments of Jim Johannessen, Coastal Geologic Services)

Additional phases of the Master Plan include seawall redevelopment and nearshore restoration for the remainder of the park. The City is developing a project feasibility analysis for activities at the Park's northern shoreline. A number of alternatives are currently under consideration by the City and various state and federal regulatory agencies. The proposal potentially would include the removal of up to 1,800 feet of shoreline protection structures including concrete bulkheads, riprap revetments, and rock groins. Once these structures are removed, substrates would be placed and slopes shaped similar to what was completed at the south end of the park shoreline. In some locations, these actions would restore the natural delivery paths of sediments from the creeks and bluffs. All of the alternatives included in the feasibility analysis incorporate conservation of the bluff at the north end of the park, which is the segment ranked as the highest conservation priority within drift cell KI-5-1 (Johannessen, MacLennan, and McBride, 2005). Although the alternatives under consideration vary in the degree of restoration to be implemented, all alternatives include a substantial improvement from the existing condition.

In addition to the restoration actions being undertaken as part of the Master Plan, park staff and volunteers have conducted on-going vegetation management within shoreline areas, including invasive species removal and native plant installation.

### **3.1.1 Timeline, Benchmarks, and Funding**

The feasibility evaluation of the Seahurst North Shoreline project has been reviewed in its draft form with the project stakeholders and permitting agencies, and will be coordinated with the Army Corps of Engineers (COE) and finalized in 2009. Following this task the project will progress into 30% design documents, a funding and phasing plan, and environmental review, all of which are anticipated to be completed during 2009.

All phases of current and future project development incorporate review by stakeholders and permitting agencies. In addition, project funding partners currently including the COE, Washington Department of Fish and Wildlife (WDFW), King Conservation District (KCD), as well as anticipated Puget Sound Partnership (PSP), will be provided restoration goals, benchmarks and timelines. Current project funding includes \$1,100,000 from WDFW and \$150,000 from KCD, with an additional \$2,000,000 request submitted to the Puget Sound Partnership. Final project design and construction is anticipated to begin in summer 2010.

### **3.1.2 Implementation and Review Mechanisms**

Throughout the Seahurst North Shoreline project there are in place mechanisms that provide for stakeholder and permitting agency reviews. Project alternatives, design development and environmental checklists will be shared with multiple internal and external partners and agencies. The monitoring of natural processes, which have been an ongoing process in the recently completed Seahurst South Shoreline restoration, will continue to occur with the restoration of the north shoreline. Processes currently monitored include; eelgrass, beach profile, benthic macroinvertebrate surveys and forage fish. Monitoring has and will occur on a pre and post construction basis in order to evaluate restoration success and to share this information with local and regional entities.

## **3.2 EAGLE LANDING PARK**

Eagle Landing Park, acquired by the City in 2002, consists of approximately 5 acres of land set aside for passive recreation and conservation. Since that time the City has opened trails and performed reforestation work for the purposes of preserving salmon habitat and providing public water access. During the last four years a substantial effort based on community volunteer labor, largely coordinated through the City's Adopt-A-Park program and local community volunteers, has been focused on removing invasive vegetation and planting native shrubs and trees. The Parks Department is planning to complete a Vegetative Management Plan (VMP) for the Park in 2009, which will provide site-specific habitat evaluations and recommendations for the property. The City is currently acquiring funding and identifying consultants to complete this work.

### **3.2.1 Timeline, Benchmarks, and Funding**

Restoration efforts at Eagle Landing Park continue to be included as on-going Adopt-A-Park work parties to remove invasive plant species and planting of native species. These efforts occur three times a year, with the next work party scheduled for February 27, 2009. In addition to these volunteer efforts, the more comprehensive VMP is anticipated for completion in 2009, with partial funding acquired from the Washington Department of Natural Resources (WDNR) and staff seeking additional funds through other local granting agencies. The VMP will establish a baseline for current vegetative habitat conditions and development a multi-year work plan to guide future funding and management priorities.

### **3.2.2 Implementation and Review Mechanisms**

The VMP will comprehensively assess current habitat types and conditions, identify publicly accepted restoration goals and develop a strategy for implementing restoration efforts based on resource capabilities. This will guide future restoration efforts within a variety of economic climates to ensure constant forward progress towards habitat management goals.

## 4 ADDITIONAL RESTORATION OPPORTUNITIES

Both the Shoreline Inventory (Grette Associates 2008a) and Shoreline Analysis and Characterization (Grette Associates 2008b) describe general and specific restoration opportunities within the City of Burien in addition to the existing and ongoing Seahurst and Eagle Landing Parks activities discussed previously (Section 3). Currently, there are no specific plans in place to fund or implement any of these activities apart from those described in Section 3. This list should not be considered exhaustive of all restoration potential within the City, but does reflect a thorough review of those documented opportunities gathered during the Shoreline Master Plan process.

Restoration opportunities based on degraded conditions and/or impaired function, as identified earlier in the Shoreline Master Plan process, are described in Table 3. This table is geographically by shoreline reach. The restoration projects are ranked from 1 (highest priority) to 4 (lowest priority) based on the assessment of the following criteria: benefit to shoreline ecological functions and values; site owned by city or ability of city to accomplish project with property owner's consent; feasibility related to built environment (e.g., existing SFRs, protective bulkheads); and ability to fund or finance project. The table also includes a column for special considerations, for instance property ownership issues or that areas have been identified as high priority for restoration or conservation actions. For consistency, Seahurst Park and Eagle Landing Park are included in this table.

It is important to note that Draft Cumulative Impacts Analysis for this SMP update concludes that adverse cumulative impacts resulting from reasonably foreseeable development activity are expected to be limited, particularly given benefits of the planned restoration activities within Seahurst and Eagle Landing Parks (Reid Middleton 2008). While implementation of the actions for which no current formal plans exist may not be necessary to offset cumulative impacts, the City should use this information to identify or prioritize restoration efforts as opportunities for funding arise and/or as the need for restoration in order to mitigate for development impacts occurs.

As plans for implementing restoration actions are developed, either as actions in and of themselves or as mitigation for impacts associated with development or, more likely, redevelopment, timelines and benchmarks for implementation will be developed. Project monitoring would be a requirement for any action which is undertaken as mitigation for development impacts. For projects which are implemented solely as restoration actions, the City should ensure that appropriate monitoring is conducted to demonstrate the actions have been effective. In some cases, for instance removal of creosote pile, monitoring may not be appropriate.

**Table 3. Additional shoreline restoration opportunities in the City of Burien.**

Reach	Type & Rank (1-4)	Location; Degraded Condition and/or Impaired Function	Description of Impaired/Degraded Condition	Special Considerations	Restoration Opportunities
Marine, All	General 1	All shorelines, water quality	Category 5 (Fecal Coliform), Category 4 (Fish Habitat), generally associated with M3, but applicable to all shorelines.	Private property ownership for majority of shoreline area limits non-voluntary restoration actions.  Note also that actions (voluntary or otherwise) outside of the shoreline zone but draining to shorelines could improve shoreline water quality.	Voluntary actions for shoreline users: vegetation enhancement (run-off buffer), pet-waste management.
Marine, All	General 2	All shorelines, water quality	While most of the shoreline area is serviced by the Southwest Suburban Sewer District (SWSSD), there are areas within draining to the shoreline areas of all marine reaches that are not ( <a href="http://www.swssd.com/misc-pdf/sewer-map-20080718a.pdf">http://www.swssd.com/misc-pdf/sewer-map-20080718a.pdf</a> ). The SWSSD continues to receive reports of failing septic systems above reach M3 which corresponds to an area of mapped by King County Department of Health as having failing septic features between the 1970s – 1990 (D. Johanson, City of Burien Senior Planner).	Extension of sewer services can be costly dependent on a number of different factors, and requires significant neighborhood coordination, including formation of a Utility Local Improvement District (ULID).	Monitor for and repair failing septic systems (near term); work toward incorporating shoreline users into the SWSSD (long term).
M1	Specific 3	Salmon Creek Mouth, fish access	Fence at mouth of Salmon Creek and large rock impede upstream access for salmonids.	Fence is located on private property. Current status of fence unknown (D. Johanson, City of Burien Senior Planner)	Remove fence and boulder.  Other restoration activities (vegetation enhancement, stream channel restoration) may be possible, no specific plans describe these activities

Reach	Type & Rank (1-4)	Location; Degraded Condition and/or Impaired Function	Description of Impaired/Degraded Condition	Special Considerations	Restoration Opportunities
M1	General 2	Entire reach; sediment transport, shoreline armoring	Modified shorelines including bulkheads and bluff residential development (toe and top) degrade sediment source and transport; this may affect potential/documented forage fish spawning areas. Some opportunities for conservation of existing function.	High priority for feeder bluff restoration (Johannessen, MacLennan, and McBride, 2005 <sup>1</sup> ); property ownership limits non-voluntary actions; development pattern limits opportunities based on continued safe occupation and use of property. Large-scale reestablishment of historic feeder bluff conditions not feasible, but benefit may be had from incremental, voluntary actions as well as conservation of relatively intact areas. Forage fish spawning areas may receive additional benefit from incremental actions.	Conserve areas north of Seahurst Park that are not currently bulkheaded; Encourage voluntary bulkhead removal and/or setback where appropriate to improve function including sediment transport. Consider beach recontouring and/or substrate placement to improve conditions for forage fish spawning. Conserve existing function.
M1	General 1	Entire reach; degraded shoreline vegetation	Residential development with highly modified vegetation (native vegetation limited/absent, ornamental and invasive vegetation present).	Private property ownership for majority of shoreline area limits non-voluntary restoration actions.	Encourage voluntary vegetation enhancement and restoration actions on private property to improve shoreline function. Conserve existing function.

Reach	Type & Rank (1-4)	Location; Degraded Condition and/or Impaired Function	Description of Impaired/Degraded Condition	Special Considerations	Restoration Opportunities
M2	Specific 1	Seahurst Park; sediment transport, shoreline armoring, degraded vegetation, degraded habitat conditions	Historic development in the park resulted in substantial shoreline modifications including shoreline hardening, fill, disconnection between uplands and marine areas, and other modifications. Restoration and park redevelopment actions are described in the park's Master Plan. See Section 3.1 for additional discussion of Seahurst Park.	<p>South Seawall actions completed in 2005 (cooperation with ACOE) included restoration in high priority feeder bluff restoration area (Johannessen, MacLennan, and McBride, 2005<sup>1</sup>).</p> <p>North shoreline of the Park is high priority for feeder bluff conservation (Johannessen, MacLennan, and McBride, 2005<sup>1</sup>).</p> <p>Alternatives for the North Seawall are currently in consideration (see Section 3.1).</p>	<p>Elements of planned restoration include removal of shoreline protection structures, restoration of beach slopes and substrates, and native vegetation enhancement and restoration, as well as preservation of existing functioning habitat elements (see Section 3.1).</p>
M2	General 4	South of Seahurst Park; shoreline armoring,	Residential lots primarily with development outside of the shoreline zone; very limited armoring with largely undeveloped shoreline (some vacant lots). Includes potential/documentated forage fish spawning areas. Opportunity for conservation of existing function.	Private property ownership for limits non-voluntary restoration actions.	<p>Relatively low priority for restoration of sediment source/transport (Johannessen, MacLennan, and McBride, 2005<sup>1</sup>), voluntary bulkhead removal and/or setback would require evaluation for safety of continued use of developed site.</p> <p>Consider beach recontouring and/or substrate placement to improve conditions for forage fish spawning.</p> <p>Conserve existing function.</p>

Reach	Type & Rank (1-4)	Location; Degraded Condition and/or Impaired Function	Description of Impaired/Degraded Condition	Special Considerations	Restoration Opportunities
M2	General 3	South of Seahurst Park; degraded shoreline vegetation	Likely degraded vegetation (invasive vegetation) as has been typical in similar conditions at Seahurst and Eagle Landing Parks. Opportunity for conservation of existing function.	Private property ownership for majority of shoreline area limits non-voluntary restoration actions.	Encourage voluntary vegetation enhancement and restoration actions on private property to improve shoreline function. Conserve existing function.
M2	Specific 2	Eagle Landing Park; degraded vegetation	Native vegetation limited, invasive vegetation present	On-going efforts in the park at large to remove invasive species and plant native vegetation see Section 3.2); City acquiring funding for vegetation management plan (S. Roemer, City of Burien Parks Planner).	Continued volunteer-supported vegetation management, integrate implementation of the vegetation management plan once it is available (see Section 3.2).

Reach	Type & Rank (1-4)	Location; Degraded Condition and/or Impaired Function	Description of Impaired/Degraded Condition	Special Considerations	Restoration Opportunities
M3	General 3	Entire reach; sediment transport, shoreline armoring	Reach is almost entirely developed with single family residences located near or within the shoreline zone; most of which have armored shorelines. Includes potential/documentated forage fish spawning areas.	High priority for feeder bluff restoration and conservation (Johannessen, MacLennan, and McBride, 2005 <sup>1</sup> ), property ownership limits non-voluntary actions; development pattern limits opportunities based on continued safe occupation and use of property.  Large-scale reestablishment of historic feeder bluff conditions not feasible, but benefit may be had from incremental, voluntary actions as well as conservation of relatively intact areas. Forage fish spawning areas may receive additional benefit from incremental actions.	Although high priority for restoration and conservation (Johannessen, MacLennan, and McBride, 2005 <sup>1</sup> ), bulkhead removal and/or setback generally not appropriate due to development pattern.  Consider beach recontouring and/or substrate placement to improve conditions for forage fish spawning.
M3	General 2	Degraded shoreline vegetation (native vegetation limited/absent, invasive vegetation present)	Residential development with highly modified vegetation (native vegetation limited/absent, ornamental and invasive vegetation present).	Private property ownership for majority of shoreline area limits non-voluntary restoration actions.	Encourage voluntary vegetation enhancement and restoration actions on private property to improve shoreline function.
M3	General 1	Mouths of unnamed tributaries; degraded vegetation	Native vegetation limited, invasive vegetation present	Private property ownership limits non-voluntary restoration actions	Encourage voluntary vegetation enhancement and restoration actions on private property to improve shoreline function.

Reach	Type & Rank (1-4)	Location; Degraded Condition and/or Impaired Function	Description of Impaired/Degraded Condition	Special Considerations	Restoration Opportunities
M4	General 4	Entire reach; sediment transport, shoreline armoring	Reach is almost entirely developed with single family residences located near or within the shoreline zone; most of which have armored shorelines. Includes potential/documentated forage fish spawning areas.	Property ownership limits non-voluntary actions; development pattern limits opportunities based on continued safe occupation and use of property. Benefit may be had from incremental, voluntary actions. Forage fish spawning areas may receive additional benefit from incremental actions.	Relatively low priority for restoration of sediment source/transport (Johannessen, MacLennan, and McBride, 2005 <sup>1</sup> ). Bulkhead removal and/or setback generally not appropriate due to development pattern. Consider beach recontouring and/or substrate placement to improve conditions for forage fish spawning.
M4	General 1	Degraded shoreline vegetation (native vegetation limited/absent, invasive vegetation present)	Residential development with highly modified vegetation (native vegetation limited/absent, ornamental and invasive vegetation present).	Private property ownership for majority of shoreline area limits non-voluntary restoration actions.	Encourage voluntary vegetation enhancement and restoration actions on private property to improve shoreline function.
M4	Specific 3	Sediment transport; water quality	Removal of a groin and/or a number of creosote pile would improve shoreline conditions (Johannessen, MacLennan, and McBride (2005).	May be located in-part or entirely on private land; limits non-voluntary restoration actions.	Remove groin and/or creosote pile.
M4	Specific 2	SW 172nd Street; water quality	Untreated storm water runoff from the road enters Puget Sound		Implement treatment measures along this stretch of roadway.

Reach	Type & Rank (1-4)	Location; Degraded Condition and/or Impaired Function	Description of Impaired/Degraded Condition	Special Considerations	Restoration Opportunities
LB	General 1	Water quality	Water quality is affected by storm water input and non-point runoff from maintained property surrounding the shoreline.	Private property ownership limits non-voluntary restoration actions and precludes programmatic restoration.	Opportunity for property owners to maintain water quality through coordinated stewardship and landscape maintenance practices.

Analyses in this document are based solely on comparison of current and historic shoreline conditions and do not take into account biological or socioeconomic factors.

**Table 4. Potential funding sources for shoreline restoration projects.**

Grant Name	Allocating Entity	Contact
Aquatic Lands Enhancement Account	Washington State Recreation and Conservation Office	Leslie Ryan-Connelly Phone: (360) 902-3080 E-mail: <a href="mailto:leslie.ryan-connelly@rco.wa.gov">leslie.ryan-connelly@rco.wa.gov</a>
Bring Back the Natives	National Fish and Wildlife Foundation	Barrett Bohnengel Phone: (503) 417-8700 E-mail: <a href="mailto:Barrett.Bohnengel@nfwf.org">Barrett.Bohnengel@nfwf.org</a>
Community-Based Restoration Program	National Oceanic and Atmospheric Administration	Polly Hicks Phone: (206) 526-4861 E-mail: <a href="mailto:Polly.Hicks@noaa.gov">Polly.Hicks@noaa.gov</a>
Cooperative Endangered Species Conservation Fund	United States Fish and Wildlife Service	Heather Hollis Phone: (503) 231-2372 E-mail: <a href="mailto:Heather_Hollis@fws.gov">Heather_Hollis@fws.gov</a>
Estuarine and Salmon Restoration Program	Washington Department of Fish and Wildlife; Puget Sound Nearshore Partnership	Jenna Norman Phone: (360) 902-2658 E-mail: <a href="mailto:ESRP@dfw.wa.gov">ESRP@dfw.wa.gov</a> Paul Cereghino Phone: (360) 902-2603 E-mail: <a href="mailto:ceregprc@dfw.wa.gov">ceregprc@dfw.wa.gov</a>
Five-Star Restoration Program	National Fish and Wildlife Foundation	Amanda Bassow Phone: (202) 857-0166 E-mail: <a href="mailto:Amanda.Bassow@nfwf.org">Amanda.Bassow@nfwf.org</a>
King County Community Salmon Fund	National Fish and Wildlife Foundation	Cara Rose Phone: (503) 417-8700 E-mail: <a href="mailto:Cara.Rose@nfwf.org">Cara.Rose@nfwf.org</a>
Landowner Incentive Program	Washington Department of Fish and Wildlife, Lands Division	Ginna Correa Phone: (360) 902-2478 E-mail: <a href="mailto:corregcc@dfw.wa.gov">corregcc@dfw.wa.gov</a> Jeff Skriletz Phone: (360) 902-8313 E-mail: <a href="mailto:skrijks@dfw.wa.gov">skrijks@dfw.wa.gov</a>

Grant Name	Allocating Entity	Contact
Puget Sound Coastal Program	United States Fish and Wildlife Service	Ginger Phalen Phone: 360-753-9008 E-mail: <a href="mailto:Ginger_phalen@fws.gov">Ginger_phalen@fws.gov</a>
Salmon Recovery Funding Board	Washington State Recreation and Conservation Office	Tara Galuska Phone: (360) 902-2953 E-mail: <a href="mailto:Tara.Galuska@rco.wa.gov">Tara.Galuska@rco.wa.gov</a>
Water Quality Grants and Loans	Washington Department of Ecology	Jeff Nejedly Phone: (360) 407-6566 E-mail: <a href="mailto:jnej461@ecy.wa.gov">jnej461@ecy.wa.gov</a>

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