CITY OF FIFE
SHORELINE MASTER PROGRAM UPDATE

RESTORATION PLAN

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1 INTRODUCTION

This report has been generated to meet the requirements of Restoration Planning component of the City of Fife's (City's) Shoreline Master Program (SMP) update (Phase 4, Task 4.1). It builds upon other elements of the City's SMP update completed to date including the Shoreline Inventory and Characterization (Grette Associates 2010), and the Cumulative Impacts Analysis (Grette Associates 2011). The format of this report is based Ecology's guidance for Restoration Planning, based on WAC 173-26-201 (2) F, which is presented below in *italics* for reference:

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.

The development of a shoreline restoration plan is often considered to be one of the most important tasks of the Shoreline Master Program Update process. Although restoration is not a direct requirement for private development within the shoreline, it can and often is undertaken by local private and public interests to improve shoreline ecological function. In addition, local governments can also utilize restoration programs to meet the "no net loss" requirement of the Shoreline Master Program update process, as shown in the following figure:

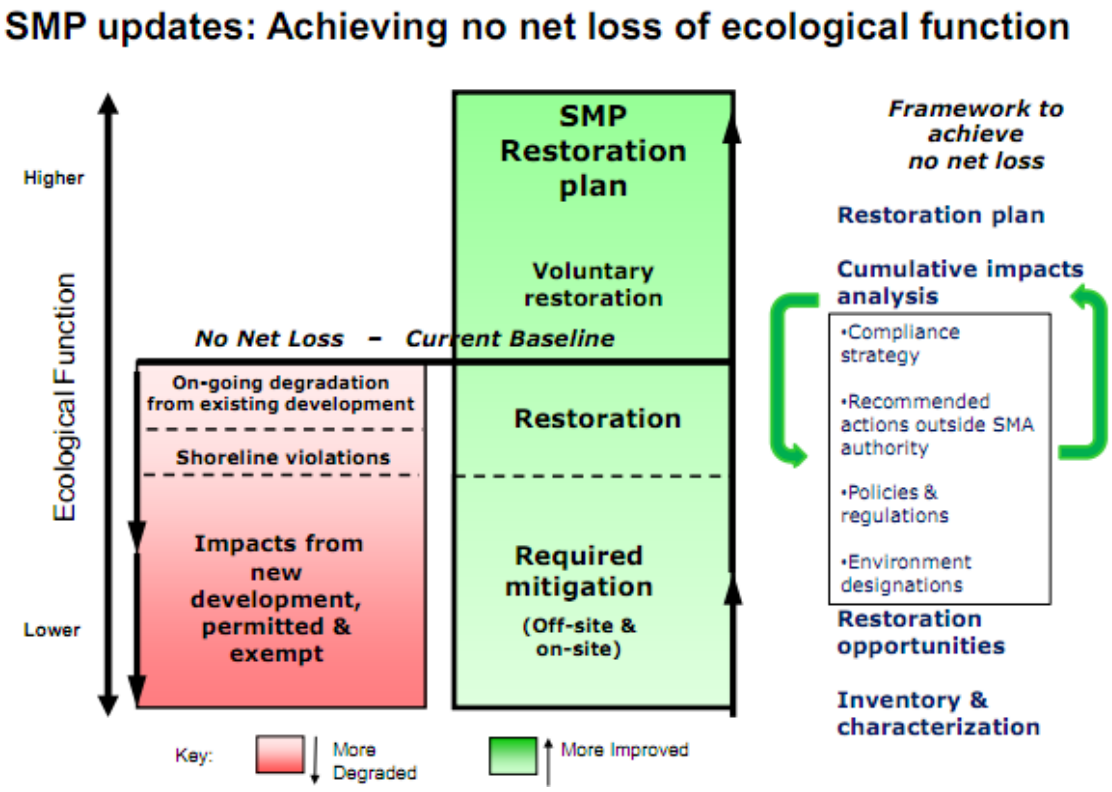


Figure 1: Washington State Department of Ecology's achieving no net loss of ecological function chart.

As identified within the Cumulative Impacts Analysis, restoration actions are not necessarily required within the City to achieve the overarching goal of no-net-loss but could serve to address incremental and unanticipated impacts to shoreline function. Addressing incremental and unanticipated impacts to shoreline function is necessary because research of mitigation projects has demonstrated that even well-designed and implemented mitigation projects often have some degree of failure, e.g. plant mortality, unintended modifications to surface and subsurface hydrology, herbivory by animals. A restoration plan, therefore, can be used to offset the expected loss of function that is likely to occur from site-specific mitigation and other incremental impacts sustained over time.

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 they are 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 urban environments such as the City of Fife where reestablishment of pre-development processes and functions may not be feasible or desirable. There are substantial constraints in terms of property ownership and development conditions for much of Fife's shorelines, particularly the levee associated with the Puyallup River shoreline. In this case, alternative restoration actions, such as the co-operative creation of off-channel habitat, should be considered.

The City has a demonstrated commitment to incorporating restoration into its public facilities. The prime example of this is the development of the Hylebos Creek Habitat area and the Milgard Habitat area which has dramatically improved habitat conditions and functions within the Hylebos Creek jurisdiction in the city.

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 functions, building directly on the Inventory and Characterization (Grette Associates 2010) and draft Cumulative Impacts Analysis (Grette Associates 2011) already prepared as part of this SMP update.

1.2 REPORT ORGANIZATION

This document is organized in such a format as to generally follow the requirements for Shoreline Restoration Plans as set forth by WAC 173-26-201 (2) F. Following this introductory section, a summary of existing shoreline function generated from the Inventory and Characterization and the Cumulative Impact Analysis documents is provided (Section 2). This section is followed by a discussion of the restoration goals, policies, and priorities for restoration (Section 3). Section 4 provides a detailed discussion of existing restoration activities that have already occurred within the City to improve shoreline function, and Section 5 identifies other areas that have the potential to provide future restoration opportunities that may be pursued by the City to improve shoreline function. A framework for the implementation of restoration programs is provided in Section 6. This document is concluded with a summary of the findings of the document (Section 7) and a list of references used to complete this document (Section 8). Maps that were generated to clarify the location of reaches and existing restoration areas are provided in the Appendix.

2 SHORELINE INVENTORY AND CHARACTERIZATION SUMMARY

2.1 INTRODUCTION

The existing shoreline functions, including degraded areas, impaired ecological function and sites with potential for ecological restoration, within the City of Fife were identified in the Inventory and Characterization document (Grette Associates 2010) and the Cumulative Impacts Analysis (Grette Associates 2011). The remainder of this section is a summarization of the ecosystem and reach specific data included in those two documents.

2.2 SHORELINES WITHIN THE CITY OF FIFE

The shoreline jurisdiction within the City of Fife includes two separate riverine systems, the Puyallup River and Hylebos Creek. The existing conditions within the City of these two systems were initially described in the Shoreline Master Program Update: Inventory and Characterization document dated September 2010 (Grette Associates). That document included descriptions of the shoreline jurisdiction, the ecosystem context and watershed processes that serve to define the shoreline function within the City. The Inventory and Characterization document also provided reach specific analysis including data on current land use and shoreline function including hydrologic, vegetative and habitat function. A summary of the findings of that document, divided by riverine system, is provided in the remainder of this Chapter.

2.2.1 Puyallup River

The lower extent of the Puyallup River channel, including the portion of the river within the City, has been historically modified to reduce flooding impacts and allow development along the river. Modifications to the river primarily include levees, dikes and revetments. Within the City, a levee extends along the bank of the extent of the river. These modifications have resulted in the straightening and hardening of the channel and have subsequently reduced shoreline function, including hydrologic, vegetation, and habitat functions. For example, historic records of the Puyallup River indicate that the lower mainstem of the river was coniferous riparian habitat with associated side and off channel habitat. During the construction of the levee, the coniferous riparian habitat was removed and the majority of connectivity to side and off channel habitat was also disturbed. Continued maintenance of the levees often eliminates adjacent vegetation and eliminates sources of large woody debris (LWD). It is currently estimated that only 5% of the mainstem of the Puyallup contains high quality habitat (Kerwin 1999). During the inventory and characterization process, no designated high quality habitat areas were identified directly adjacent to the OHWM of the Puyallup River within the City.

Within the City of Fife, the Puyallup River shoreline jurisdiction was divided into three separate reaches. These reaches are described in the table as follows:

Table 1: City of Fife Puyallup River Shoreline Jurisdiction Reach Summary

Land Use Types[1]	Shoreline Function			Qualitative Summary Function Score[1]
	Hydrologic	Vegetation	Habitat	
P1 **Approximate Length:** 13,150 feet **Description:** I-5 Bridge (North City Limit) upstream to the hydrological connection to the Oxbow wetland upstream of 54th Ave				
Total Acreage – 206.76 Commercial/Service – 9.36 acres (4.52%) Open Space/Recreation – 0.06 acres (0.03%) Resource Land – 34.62 acres (16.74%) Single Family Residential – 20.34 acres (9.84%) Vacant – 136.68 acres (66.11 %) Water Body – 5.70 acres (2.76 %)	Low: This reach contains high amounts of channel modification, including the levee that extends along the entire length of the reach, as well as the impaired water quality evidenced by the 303(d) listings.	Low: This reach contains high amounts of alteration to the vegetation as well as the potential for future alteration.	Low: This reach has a minimal amount of mapped habitat. Existing shoreline habitat coincides with the levee and is subject to disturbance.	**Low**

Land Use Types[1]	Shoreline Function			Qualitative Summary Function Score[1]
	Hydrologic	Vegetation	Habitat	
P2 **Approximate Length:** not applicable - removed from the shoreline **Description:** Oxbow wetland, hydrological connection to Oxbow wetland, Frank Albert Road wetland				
Total Acreage – 138.61 Open Space/Recreation – 25.27 acres (18.23 %) Resource – 42.14 acres (30.40%) Vacant – 60.17 acres (43.41%) Single Family Residential – 7.87 acres (5.68%) Transportation, Communication, Utility – 3.16 acres (2.28%)	Medium-High: This reach provides high levels of stormwater storage capacity for the City	Medium-High: This reach contains two protected wetlands. Each wetland is primarily emergent but also contains forested areas. Both wetlands contain Tribal Land.	Medium – High: Both wetlands within this reach have been mapped as containing Priority Habitat.	**Medium-high**

Land Use Types[1]	Shoreline Function			Qualitative Summary Function Score[1]
	Hydrologic	Vegetation	Habitat	
P3 **Approximate Length:** 9,840 feet **Description:** Upstream edge of the hydrological connection to the Oxbow wetland to Freeman Rd (southeast city limit)				
Total Acreage- 116.87 Commercial/Service – 1.6 acres (1.37%) Industrial – 16.39 acres (14.02%) Open Space/Recreation – 0.38 acres (0.34%) Resource Land – 52.44 acres (44.87%) Single-Family Residential – 22.19 Acres (23.93%) Vacant – 13.94 acres (11.93%) Mobile Home Park – 8.20 Acres (7.01%)	Low: This reach contains high amounts of channel modification, including the levee that extends along the entire length of the reach, as well as the impaired water quality evidenced by the 303(d) listings.	Low: This reach contains high amounts of alteration to the vegetation as well as the potential for future alteration.	Low: This reach has a minimal amount of mapped habitat. Existing shoreline habitat coincides with the levee and is subject to disturbance.	**Low**

[1] Data derived from Pierce County and City of Fife GIS data. Percentages may not equal 100% due to rounding.

2.2.2 Hylebos Creek

Similar to the lower extent of the Puyallup River, the Hylebos Creek has been altered, including channelization of the creek, residential development, and the modification and filling of adjacent wetlands. Historically, Hylebos Creek is thought to have been one of the most productive small stream systems in southern Puget Sound. However, Hylebos Creek is currently characterized as "*one of the most heavily urbanized subbasins in the State*" (Kerwin 1999). Due to the altered state of the creek, salmonid production is greatly reduced.

Within the City, most of the land along Hylebos Creek is developed for single family residential use or is vacant, undeveloped land. A small area on the south side of Pacific Highway within the shoreline jurisdiction is designated for high-density residential and commercial uses. The Hylebos creek system also contains two habitat areas, the Milgard and Hylebos Estuary.

The shoreline jurisdiction associated with Hylebos Creek within the City is also divided into three reaches. These reaches are summarized as follows:

Table 2: City of Fife Hylebos Creek Shoreline Jurisdiction Reach Summary

Land Use Types[1]	Shoreline Function			Qualitative Summary Function Score[1]
	Hydrologic	Vegetation	Habitat	
H1 **Approximate Length:** 1,650 feet **Description:** Fife City limit (north, co-terminus of 57th and 55th Ave E) upstream to 4th St E, both banks				
Total Acreage – 23.31 Multi-Family Residential – 1.34 acres (5.76%) Residential Outbuildings – 0.22 acres (0.92%) Single Family Residential – 19.97 acres (88.58%) Vacant – 1.10 acres (4.73%) Mobile Home Park – 0.39 Acres (1.65%)	Medium: Shoreline vegetation within this reach has been modified, which often leads to modification of the hydrologic process. Shoreline also contains an undetermined amount of shoreline armoring.	Medium-low: Vegetation on both the right and left banks within this reach are modified as a result of residential development.	Medium-high: This segment contains a number of critical areas. However, existing impacts to hydrology and vegetation prevent a rating of "high".	**Medium**

Land Use Types[1]	Shoreline Function			Qualitative Summary Function Score[1]
	Hydrologic	Vegetation	Habitat	
H2 **Approximate Length:** 3,335 feet **Description:** 4th St E upstream to 12th St E; both banks				
Total Acreage – 30.36 Mobile Homes – 1.37 acres (4.51%) Open Space – 24.33 acres (80.15 %) Single Family Residential – 0.38 acres (1.25 %) Transportation, Communication, Utility – 4.28 acres (14.10 %)	Medium-High: Segment has relatively intact vegetation and low amounts of impervious surfaces, based upon visual estimation of aerial photographs. Shoreline also contains an undetermined amount of shoreline armoring.	Medium-High: Shoreline vegetation within this reach is relatively intact, when compared to adjacent segments. Segment contains two restoration projects (Milgard and Hylebos Estuary Nature Areas)	Medium-High: This segment contains a number of critical areas. However, existing impacts to hydrology and vegetation prevent a rating of "high".	**Medium-High**

Land Use Types[1]	Shoreline Function			Qualitative Summary Function Score[1]
	Hydrologic	Vegetation	Habitat	
H3 **Average Length:** 4,380 feet **Description:** 12th St E upstream to 70th; both banks				
Total Acreage -2.03 Single Family Residential – 2.03 acres (100.00%) *Note: The urban growth area associated with this reach is primary commercial land use.*	Medium-Low: Review of aerial photographs indicates that portions of the segment have been channelized. Shoreline also contains an undetermined amount of shoreline armoring.	Medium-Low: The majority of the vegetation within this reach has been disturbed by both residential and commercial development. However, review of aerial photography indicates that central portions of the left bank do contain tree canopy that extends over the Hylebos.	Medium-Low: This segment contains a number of critical areas. However, impacts to hydrology and vegetation function prevent higher habitat functionality.	**Medium- Low**

[1] Data derived from Pierce County and City of Fife GIS data. Percentages may not equal 100% due to rounding.

3 RESTORATION POLICIES, GOALS AND PRIORITIES

The policies, goals and priorities for restoration as identified in this section have been generated based upon the framework established by the Shoreline Management Act [Chapter 90.58 RCW] and the Shoreline Master Program Guidelines [Chapter 173-26 WAC] as well as the understanding of shoreline processes and function both at a reach level and within the watershed context as generated during the Inventory and Characterization phase of the Shoreline Master Program update process.

3.1 POLICIES AND GOALS

3.1.1 Policies

One of the primary policies of the Shoreline Management Act [Chapter 90.58 RCW] is to protect shoreline natural resources including "...the land and its vegetation and wildlife, and the water of the state and their aquatic life..." against adverse effects. In order to address this policy as established by the SMA, the Shoreline Master Program Update Guidelines establishes a policy of "no net loss" of shoreline ecological functions as the means of implementing that framework through shoreline master programs. WAC 173-26-186(8) directs that master programs "include policies and regulations designed to achieve no net loss of those ecological functions." This is accomplished by requiring all allowed uses to mitigate adverse environmental impacts to the maximum extent feasible and preserve the natural character and aesthetics of the shoreline.

The Shoreline Master Program document establishes many polices that have been generated to promote the restoration of shoreline function within the City. These policies are as follows (Section 9 – Use Specific Regulations, (M) Restoration Plan, (2) Policies):

a. Facilitate the projects described within the Shoreline Restoration Plan.
b. Prioritize restoration and enhancement of public open space and parks within the City.
c. Create incentives to promote the integration of shoreline restoration into development projects.
d. Achieve restoration goals as identified in the restoration plan by addressing key environmental problems (e.g. flooding, shoreline and aquatic habitat degradation or loss, water quality issues).

3.1.2 Goals

The establishment of goals within the Shoreline Master Plan is not expressly required as part of the Shoreline Master Program update. However, it is beneficial in generating a restoration plan to identify goals that serve to guide the restoration process. Goals allow for the community to focus actions. Good restoration goals focus on improvement of degraded areas and impaired ecological function.

Based upon stakeholder feedback obtained during public comment meetings, the City of Fife has identified the following general restoration goals that are to be pursued within the City[1]:

- Reduce impacts of flooding events.
- Protect and improve water quality.
- Preserve existing nature areas and vegetation.
- Preserve and restore ecosystem processes and habitat function where feasible.
- Preserve and improve physical and visual public access to the shoreline.

3.2 PRIORITIES FOR RESTORATION:

In general, priority within the City of Fife should be given to restoration actions that:

- Restore connectivity between creek/river channels, flood plains and hyporheic zones, where feasible.
- Restore natural channel-forming geomorphologic processes.
- Assist in the mitigation of peak flows and associated impacts caused by stormwater runoff volume.
- Reduce sediment input to streams and rivers and associate impacts.
- Improve water quality.
- Create dynamic and sustainable ecosystems.
- Restore native vegetation and natural hydrologic functions of degraded and former wetlands.
- Replant native vegetation in riparian areas to restore shoreline function.
- Restore habitat, such as estuaries, that support salmon life cycles.
- Restoration actions in areas that have high potential for success. This can be accomplished by identifying those areas having moderate to high importance for ecosystem-wide processes and ecological functions and are not permanently impaired. Permanent impairment of ecological processes and functions occurs with paving and buildings and is typical of urban watersheds. Hylebos focus since improvement to the Puyallup is limited by the Levee and Levee Road.

[1] These goals represent a general listing and have not been provided in order of priority.

4 EXISTING RESTORATION ACTIVITIES AND RELATED PLANS AND PROGRAMS

4.1 EXISTING RESTORATION ACTIVITIES

This section of the restoration plan identifies existing and ongoing restoration projects that have been implemented to contribute to local restoration goals.[2] Identified existing restoration projects include the Hylebos Creek Nature area, the Milgard Nature area and the Radiance Oxbow Nature Area. A map identifying these restoration areas is provided at the end of this document in the section entitled *Restoration Plan Exhibits* (Figure 14).

4.1.1 Hylebos Creek/ Milgard Nature Areas

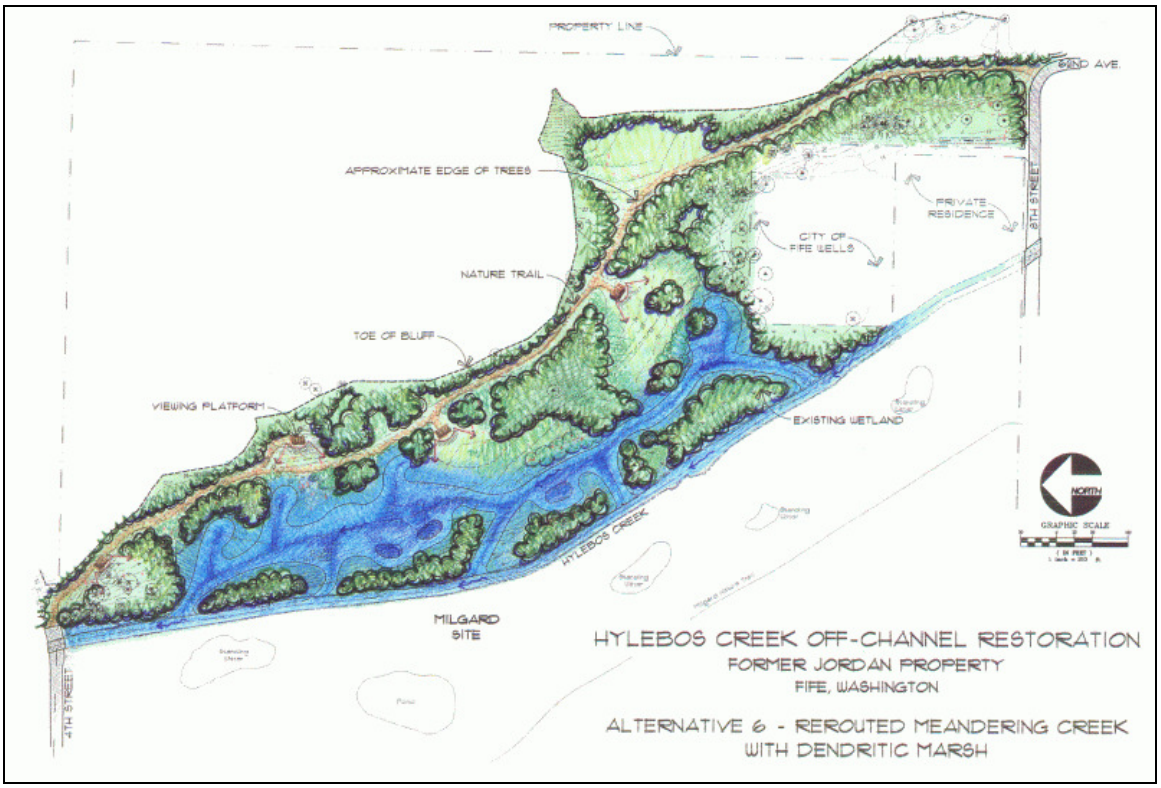


Figure 2: Hylebos Creek aspect of the Hylebos Creek/Milgard Nature Area

The Hylebos Creek/ Milgard Nature Area is a 24.3 acre habitat restoration site comprised of two separate but similar restoration activities designed to address the following major components:

- Create fish rearing and feeding habitat
- Create wildlife habitat for birds and small mammals in buffer areas
- Increase habitat complexity and diversity adjacent to Hylebos Creek (large woody debris, substrate, etc.)
- Preserve existing wetland areas to the extent possible
- Preserve larger trees

[2] The Shoreline Master Program guidelines also recommend that this section address proposed restoration projects or programs with a high likelihood of occurring, however, none were identified during the drafting of this document.

- Avoid impacts to adjacent residential properties
- Avoid impacts to the City of Fife water supply wells
- Provide site access such as trails, walkways or overlooks for walkers and nature lovers

The Hylebos Nature area occupies 15.3 acres of the overall nature area and was constructed as a joint effort between the Commencement Bay Natural Resource Damage Assessment and Restoration Trustees, under the leadership of the National Oceanic and Atmospheric Administration (NOAA). This property was acquired and annexed by the City of Fife in 2003. The Milgard nature area occupies 9 acres of the overall nature area and was constructed as mitigation to address development by Milgard within the City of Fife on another site. Construction of both nature areas was completed by early 2007.

The City of Fife maintains both properties and utilizes volunteers to provide both trail maintenance and invasive plant species control. The City of Fife intends to utilize this nature area to provide further public access opportunities in the future.

4.1.2 Radiance Oxbow Green Space and Wetland Mitigation

The Radiance Oxbow Green space & Wetland Mitigation is 5.93 acres. It is comprised of numerous tracts of open spaces lying adjacent to property owned by Pierce County Public Works. These undeveloped parcels provide wildlife and wetland habitat and may also play an important role in future trail system development

4.2 RELATED PLANS AND PROGRAMS

The following subsections identify plans and programs that are being implemented or may be pursued within the City of Fife to improve shoreline habitat.

4.2.1 WRIA 10/12 Efforts for Salmon Restoration

Pierce County is the Lead Entity for Salmon Restoration Efforts with Water Resource Inventory Areas 10, the Puyallup River Watershed, and 12, the Chambers/Clover Creek Watershed. Pierce County works in conjunction with the Citizen Advisory Committee (CAC) towards a stated mission to "support the recovery of self-sustaining, harvestable salmon populations in Puget Sound by restoring and protecting the habitat." A technical advisory group provides scientific data to the Citizen Advisory committee. The scientific data is then used by the Citizen Advisory Committee to prioritize proposed salmon habitat protection and restoration projects.

No salmon restoration efforts within the City of Fife were identified as being pursued during the next three years as part of the project prioritization list. However, future plans may include the City of Fife. In addition, the shorelines within the City may benefit from the restoration actions completed in adjacent jurisdictions.

4.2.2 Flood Hazard Management Plan for the Puyallup River

In 1992, Pierce County adopted the Puyallup River Comprehensive Flood Control Management Plan for the Puyallup, Carbon and White rivers. Since 2009, Pierce County Public Works and Utilities Surface Water Management Division have worked with the public, stakeholders and experts to develop the Draft Flood Plan. The Draft Flood Plan details Pierce County's proposed approach to managing flooding and channel migration hazards on major rivers, large tributaries and associated floodplains over the next 20 years (2012-2032) and includes the Puyallup River from Commencement Bay (River Mile 0.0) to Champion Bridge (River Mile 28.9). The City of Fife is a part of this planning area.

The flood hazard plan contains several projects that may be pursued in the City of Fife including a proposal to setback the levee adjacent to Frank Albert Road so that it can safely convey the 100-year flood elevation plus 3 additional feet. Completion of this project would allow for re-accrediting by the US Army Corps of Engineers and the Federal Emergency Management Agency.

4.2.3 City of Fife Plans/Regulations

The following sub-sections identify existing City of Fife Plans and regulations that may also serve to improve shoreline habitat within the City.

4.2.3.1 Comprehensive Plan

The City of Fife Comprehensive Plan (City of Fife 2005) provides City decision makers with guidelines regarding issues effecting the future shape, character and form of the City. The Comprehensive Plan contains a Land Use element that identifies the following environmental goal for the city:

> *"Maintain land use policies and patterns that adequately protect and preserve environmental systems and amenities including wetlands, floodplain areas, shorelines, seismic hazard areas, and fish and wildlife habitats."*

4.2.3.2 Critical Areas Regulations

The City of Fife Municipal Code includes critical area regulations (Title 17), which applies to areas outside of the shoreline jurisdiction. These regulations were generated based upon best available science and provide protection to the critical areas within the city, including frequently flooded areas, geologically hazardous areas, seismic hazard areas, fish and wildlife habitat conservation areas, and wetlands.

4.2.3.3 Stormwater Management

The City of Fife manages stormwater pursuant to a Phase II stormwater municipal permit issued by the Washington State Department of Ecology. The Permit allows municipalities to discharge stormwater runoff from municipal drainage systems into the State's waterbodies (e.g., streams, rivers, lakes, and wetlands) as long as municipalities implement programs to protect water

quality by reducing discharges of "non-point source" pollutants to the "maximum extent practicable" through application of Permit-specified requirements. As part of obtaining the stormwater municipal permit, the City had to prepare a Comprehensive Stormwater Management Program. The program contains data on the following components:

- Public Education and Outreach
- Public Involvement
- Illicit Discharge Detection and Elimination
- Runoff Controls
- Pollution Prevention and Municipal Operations and Maintenance
- Monitoring

The Permit also requires the City to report annually on progress in Program implementation for the prior year as well as describe proposed Program activities for the coming year. As a result of this requirement, the City's Stormwater Management Program is modified annually to incorporate public, council and staff recommendations and input.

4.2.3.4 *Floodways and Floodplain Regulations*

Development in areas prone to flooding outside of the shoreline jurisdiction is regulated within the Fife Municipal Code, Chapter 15.40 Flood Damage protection and Chapter 17.09 Frequently flooded areas. Development in areas prone to flooding inside the shoreline jurisdiction is regulated pursuant to the Shoreline Master Program, Appendix B, Chapter SMP17.09.

In addition to specific floodplain and floodway regulations, the City of Fife employs the following strategies to reduce flood risk:

- Low Impact Development Regulations
- Develop/refine Flood Warning Systems, Emergency Evacuation Plans, and Flood Preparedness
- Regular Public Outreach
- Urge Homeowners to Purchase Flood Insurance
- Require and Maintain Elevation Certificates on Properties Located within a Flood Plain
- Maintain Base Flood Elevation Benchmarks
- Maintain a Flood Hazard Mitigation Plan
- Require Compensatory Storage

- Drainage System Maintenance

4.2.3.5 Sewer and Septic waste disposal

Pursuant to Fife Municipal Code Chapter 19.68.130, most lots requiring new sanitary waste facilities are required to hook up to public sewer prior to the issuance of occupancy.

5 FUTURE RESTORATION OPPORTUNITIES

In addition to identifying existing restoration areas, another aspect of the restoration plan is to identify future restoration opportunities. In order to identify possible restoration opportunities within the City, the following questions were used to guide the discussion:

- What kind of restoration would address environmental problems?
- Where should restoration actions occur to most effectively address environmental problems?
- Where are the "high priority" restoration areas within the City?
- What other projects and programs could be used to address impaired shoreline functions and provide ecological benefit to the shoreline?

Public responses received during Shoreline Master Program update meetings as well as the findings of the Inventory and Analysis (Grette Associates 2010) and draft Cumulative Impacts Analysis (Grette Associates 2011) were used to answer these questions. As noted in Section 1.1 of this document, it is more difficult to restore processes and functions in highly developed urban settings. Potential restoration sites within the City are generally identified as those that are less impaired, such as undeveloped lots, parks, riparian buffers or undeveloped sections of industrial sites.

5.1 GENERAL AND ECOSYSTEM SPECIFIC RESTORATION OPPORTUNITIES

The following are general and ecosystem specific restoration opportunities that may be addressed within the City:

General

- Ensure stormwater facilities and stormwater designs provide adequate water treatment before re-introduction to water bodies. Explore new stormwater technologies, including low impact development and water recycling.

- Carefully consider the impacts of uplands development upslope of shoreline areas, even outside of the shoreline jurisdiction.

- Conserve riparian vegetation within the shoreline areas, wherever possible, especially where there is opportunity for large woody debris (LWD) recruitment into the adjacent streams.

- Inform shoreline property owners about shoreline habitat and the special functions associated with shoreline areas. Promote restoration or re-vegetation of riparian areas through education or incentive programs.

- Coordinate with local jurisdictions, business, and citizen action groups on large scale habitat creation or restoration projects.

Puyallup

- Work with the Corps of Engineers and the Pierce County River Improvement district to investigate means to provide increased shoreline function along the Puyallup River without compromising flood control capacity.

Hylebos

- Conserve wetlands in the shoreline area through buffer maintenance. Consider off-channel habitat creation, enhancement or improvement projects for the Hylebos Creek, wherever possible.

- Work with shoreline property owners on pile removal, removal of hardened banks, and shoreline stabilization using vegetation and removal of remnant crossings.

5.2 REACH SPECIFIC RESTORATION OPPORTUNITIES

This table is organized geographically by shoreline reach. It also includes a column for special considerations, such as property ownership issues or that an area has been identified as high priority for restoration or conservation actions. Existing restoration projects are not included in this table unless future restoration activities are scheduled to occur for that particular site.

Table 3: Shoreline restoration opportunities in the City of Fife[3,4]

P1 Existing Condition

Existing land use within this reach is primarily vacant property, but also includes resource parcel, residential, and commercial parcel use.

Overall function is low. High amounts of modification to the natural shoreline in this reach as a result of the levee and the associate roadway which, in turn, has resulted in low hydrologic, vegetation, and habitat functionality. In addition, water quality and quantity are also likely to have been impacted by levee and associated roadway within this reach.

Many of the conditions in segment P1, particularly those related to salmonid habitat, are due to factors outside the jurisdiction of the City of Fife. These include upstream land use, major alterations in basin hydrology, and placement and maintenance of the levee. However, the City can identify areas for conservation and/or restoration within the shoreline area that would provide some habitat for non-aquatic species. In particular, as the City works with land owners to plan development downstream of Frank Albert Road, areas could be identified for open space corridors that connect upland and shoreline areas. Forested areas are strongly recommended for conservation, and could also be prioritized for connection to the shoreline areas by way of open space corridors. Additionally, where possible the City could collaborate with the Corps and Pierce County River Improvement District to develop vegetation plans for the levee that complement vegetation and open space across Levee Road as well as improve water quality, habitat, and vegetation functions.

Type	Location	Specific Description	Special Considerations	Restoration Opportunity[1]	Anticipated Timeline	Improvement to degraded condition/impaired function		
						Hydrologic	Vegetation	Habitat
General- Enhancement	Majority of shoreline.	Removal of Invasive Species from the Levee.	Property ownership. Re-vegetation options may be limited by levee function.	Improvement of habitat through the removal of invasive plant species.	Begin effort in the near term (next 1-3 years) based upon availability of volunteer staff. Maintain effort in the long term (5-10 years)	Potential for improvement to water quality exists if the invasive species removal is followed by the replanting of native species that improve water quality.	Yes	Yes (upland and nearshore)
General- Preservation and Enhancement	To be determined	The purchase of undeveloped parcels and creation of shoreline vegetation and flood storage areas.	Private property ownership limits non-voluntary actions. There may be opportunity to implement as mitigation for other projects.	Improvement of habitat through shoreline plantings and the creation of off-channel areas.	Long term effort (5-10 years and beyond) as property and funding becomes available	Yes (water storage quality)	Yes	Yes (off channel habitat for juvenile salmon species. May also provide habitat for local avian, vertabrate and invertebrate species)

P2 Existing Condition

Existing development within this reach is primarily open space recreation, resource land, and vacant property.

Overall function is medium-high. This reach contains two protected off-channel habitat wetlands which provide for hydrologic, vegetation and habitat functionality.

The majority of this reach contains open space and resource land uses. It is highly recommended that zoning be modified to reflect the existing land use. In addition, land use in the immediately adjacent areas should be planned to minimize impacts. Areas of the wetlands or their buffers that may have been altered due to past development are recommended for enhancement actions, including invasive species removal and native vegetation planting. The Oxbow wetland represents the greatest potential for the City to enhance salmonid habitat on the Puyallup shoreline. Collaboration with the Puyallup Tribe, who own land in this reach and also control the associated floodgates, and Pierce County River Improvement District to restore salmonid access to the wetland would provide a large, highly functioning salmonid rearing habitat on a stretch of shoreline that currently has no off-channel habitat and is functioning at a substantially reduced level compared to historic conditions.

Type	Location	Specific Description	Special Considerations	Restoration Opportunity[1]	Anticipated Timeline	Improvement to degraded condition/impaired function		
						Hydrologic	Vegetation	Habitat

[3] Currently, there are no specific plans in place to fund or implement any of these activities. However, future implementation and funding of these actions may occur based upon the implementation measures described in Section 6.

[4] This list should not be considered to represent all restoration potential within the City, but does reflect a thorough review of those documented opportunities gathered during the SMP process.

General-Restoration	Entire reach	City and Tribe may work together to identify restoration projects, including but not limited to the installation of native plants adjacent to the Oxbow wetland.	Implemented as part of redevelopment rather than individual projects or actions.	Incremental improvements in upland areas may be achieved through reducing impervious surfaces and utilizing other low impact development standards as applicable as redevelopment occurs.	Variable timeline based upon availability of viable projects, short term (1-3 years) to long term (5-10 years) and beyond	Yes (water quality)	Yes	Yes

P3 Existing Condition

Existing development within this reach is primarily resource land , residential and industrial.

Overall function is low. Reach contains high amounts of shoreline modification including the levee and as a result the hydrologic, vegetation and habitat functions within this reach are impacted.

As with segment P1, the City does not have jurisdiction over many of the factors influencing salmonid habitat function in this segment. Conservation of upland open space areas, particularly forested areas, is highly recommended, as is conservation and enhancement of wetland areas. Collaboration with the Pierce County River Improvement District to develop vegetation and habitat enhancement plans that complement each other on both sides of Levee Road also is recommended.

						Improvement to degraded condition/impaired function		
Type	**Location**	**Specific Description**	**Special Considerations**	**Restoration Opportunity[1]**	**Anticipated Timeline**	**Hydrologic**	**Vegetation**	**Habitat**
General-Enhancement	Majority of shoreline.	Removal of Invasive Species from the Levee.	Property ownership. Re-vegetation options may be limited by levee function.	Improvement of habitat through the removal of invasive plant species.	Begin effort in the near term (next 1-3 years) based upon availability of volunteer staff. Maintain effort in the long term (5-10 years)	Potential for improvement to water quality exists if the invasive species removal is followed by the replanting of native species that improve water quality.	Yes	Yes (upland and nearshore)
General – Preservation and Enhancement	To be determined	The purchase of undeveloped parcels and creation of shoreline vegetation and flood storage areas.	Private property ownership limits non-voluntary actions. There may be opportunity to implement as mitigation for other projects.	Improvement of habitat through shoreline plantings and the creation of off-channel areas.	Long term effort (5-10 years and beyond) as property and funding becomes available	Yes (water storage quality)	yes	Yes (off channel habitat for juvenile salmon species. May also provide habitat for local avian, vertabrate and invertebrate species)

H1 Existing Condition

Existing development for the majority of this reach is single family residential. However portions of the reach also includes multi-family residential development, and vacant property.

Overall function is medium. Reach has been modified as a result of residential development on both sides of Hylebos Creek including shoreline armoring and removal of native vegetation and habitat.

Because the entire segment is privately owned and occupied, there are essentially no opportunities for conservation and restoration without homeowner involvement or property acquisition. However, the City could explore developing an educational program to inform homeowners of actions they can take to minimize their impacts in-stream habitat or ways to enhance it with native landscaping and invasive species removal. Non-governmental organizations (such as Friends of the Hylebos, Citizens for a Healthy Bay) familiar with outreach programs in the watershed would be useful partners in such an effort.

						Improvement to degraded condition/impaired function		
Type	**Location**	**Specific Description**	**Special Considerations**	**Restoration Opportunity[1]**	**Anticipated Timeline**	**Hydrologic**	**Vegetation**	**Habitat**
General - Enhancement	Majority of shoreline.	Removal of Invasive Species from the shoreline.	Property ownership. Re-vegetation options may be limited by levee function.	Improvement of habitat through the removal of invasive plant species.	Begin effort in the near term (next 1-3 years) based upon availability of volunteer staff. Maintain effort in the long term (5-10 years)	Potential for improvement to water quality exists if the invasive species removal is followed by the replanting of native species that improve water quality.	Yes	Yes (upland and nearshore)

H2 Existing Condition

Existing development within this reach is primarily open space including the Milgard and Hylebos Creek Habitat areas.

Overall function is medium high. Vegetation, Habitat and Hydrology are relative intact for this reach as a result of undeveloped parcels and habitat areas including the Hylebos Creek and Milgard Habitat areas. However, impacts from developed areas within this reach including an unidentified amount of shoreline armoring prevent a overall function rating of high.

Restoration activities have been completed on both the right and left banks within the northern portion of this reach. The Milgard Nature area is located along the right bank and the Hylebos Estuary Nature area is located along the left bank. Conservation of the remaining undeveloped riparian areas on the left bank is strongly recommended. Additional property acquisition for conservation and restoration actions on the right bank to complement and enhance the riparian areas on the left bank also is recommended where possible, as is shoreline property owner outreach and education regarding actions they can take to minimize impacts and enhance habitat on their property. One opportunity for restoration is the left bank between 8th Street East and 62nd Avenue East, where a an undeveloped area dominated by reed canary grass with limited riparian vegetation could be cleared and replanted with native vegetation, or even graded down to create off-channel wetland habitat. Kerwin (1999) identified off-channel habitat as a limiting factor in Hylebos Creek. Off-channel habitat with a riparian community could provide input of nutrients and a forage base for coho salmon (as well as chinook). Another opportunity for restoration is the left bank immediately downstream of 12th Avenue East, where there is a large amount of debris and invasive vegetation in the shoreline area.

These opportunities are typical of those in the City shoreline area on Hylebos Creek in that they would require either significant property owner cooperation or property acquisition. The City also could develop guideline for building setbacks and riparian vegetation requirements for new residential development in this segment.

Type	Location	Specific Description	Special Considerations	Restoration Opportunity[1]	Anticipated Timeline	Improvement to degraded condition/impaired function		
						Hydrologic	Vegetation	Habitat
Specific - Restoration	Urban Growth Area	Work with Pierce County to identify restoration opportunities in the Urban Growth Area.	Identified by Parks as a priority for access improvement (trails). For pilings removal, there may be opportunity to implement as mitigation for other projects.	Incorporate invasive species removal and revegetation with native plant assemblage into trail and access improvement work, particularly along shoreline. Remove abandoned pilings.	Variable timeline based upon availability of viable projects, short term (1-3 years) to long term (5-10 years) and beyond	Yes (water quality)	Yes (remove invasives, plant native)	Yes (nearshore)

H3 Existing Condition

Existing development within the city's jurisdiction of this reach is single family residential. However, the portion of this reach within Pierce County includes primarily commercial and vacant properties.

Overall function is medium-low. High amounts of modification to the natural shoreline in this reach through commercial and residential development, including modification to the channel of Hylebos Creek and removal of native vegetation have resulted in impacts to hydrologic, vegetation, and habitat functionality.

It is strongly recommended that the City conserve remaining riparian vegetation in this segment. As with segments H1 and H2, opportunities for conservation and restoration are somewhat limited to options involving property owner involvement or property acquisition. Guidelines for building new residential development as vacant land is converted to residential areas could be used to enhance and conserve riparian areas. This is a likely scenario for the undeveloped and agricultural shoreline areas immediately upstream of 12th Avenue East. As these areas become developed, riparian areas could be conserved and vegetation restored, including removal of the large stand of Japanese knotweed (*Polygonum cuspidatum*) on the left bank and its replacement with native vegetation. The eventual extension of State Route 167 may present the greatest opportunity for habitat restoration and enhancement, as well as the greatest opportunity for partnership and coordination with stakeholders working upstream of the City.

Specific and general recommendations for habitat restoration are limited due to private property ownership of the single family residence within the city's jurisdiction. However, as noted in the inventory and characterization document (Grette Associates 2010), it is strongly recommended that the City conserve remaining riparian vegetation in this segment. This would need to be accomplished in cooperation with Pierce County.

[1] For all reaches, work at or waterward of the OHWM requires permits or approvals from one or more of the following state and federal agencies: U.S. Army Corps of Engineers, Washington Department of Fish and Wildlife, Washington State Department of Natural Resources, or Washington State Department of Ecology. Each of these regulatory agencies would apply shoreline mitigation requirements and design standards focused on minimizing adverse impacts and improving ecological function. In addition, development projects within the shoreline jurisdiction are also required to comply with the City of Fife's Stormwater Manual.

It is important to note that the draft Cumulative Impacts Analysis for the SMP identifies limited potential for reasonably foreseeable development within the shorelines, and concludes that no net-loss of function would result from SMP adoption. Because that conclusion is not dependent on the sum benefit of all of the restoration actions previously identified, it is recommended that the City use the information within this document to identify or prioritize restoration efforts as opportunities for funding arise. In some cases, the City may be able to achieve a restoration action by coordinating it as mitigation for another action. For example, suggesting removal of abandoned pilings in conjunction with an upland shoreline development project is one scenario in which this may be possible. This approach of coordinating restoration actions with development in other locations may be a good way for the City to accomplish some of these activities in a limited funding environment.

6 IMPLEMENTATION OF RESTORATION PROGRAM

6.1 PARTNERSHIP OPPORTUNITIES

The following text has been generated to summarize potential partnership opportunities for restoration activities within the City. It is not intended to be an exhaustive list as new funding partnership opportunities may become available and previously existing partnership opportunities may be exhausted during the life of this document. It is recommended that the City work on coordinating restoration efforts with these groups and/or adjacent jurisdictions either through existing channels, such as the WRIA 10/12 restoration efforts, or consider creating a new group specifically focused on improvements in the inter-related shoreline jurisdiction.

6.1.1 Friends of the Hylebos

Established in 1983, the Friends of the Hylebos is focused on protecting and restore streams, wetlands, forests and open space in the Hylebos watershed. The Friends of the Hylebos also works with Earth Corps, an organization focused on environmental restoration and community building.

More information regarding the Friends of the Hylebos is available on line at: http://hylebos.org/

6.1.2 Puget Sound Partnership

The Puget Sound Partnership was created in 2007 to be a collaborative effort, among citizens, governments, tribes, scientists and businesses, to restore and then protect the Puget Sound. The Partnership published an initial Puget Sound Action Agenda in December 2008. The 2008 Action Agenda includes strategies to protect intact ecosystem processes, structures, and functions that sustain Puget Sound and restore impacted processes, structures and functions; prevent water pollution at its source; create a coordinated system to ensure that activities and funding are focused on the most urgent and important problems facing the region; and build an implementation, monitoring, and accountability management system (PSP, 2008).

In the upcoming years the Puget Sound Partnership's focus, as defined by the Washington State Legislature, is to address the three following tasks:

1) Define a 2020 Action agenda. The action agenda will identify the work needed to protect and restore Puget Sound and is to be based on science and with clear and measurable goals for recovery.
2) Determine a system of accountability for achieving restoration results. The accountability system will include performance and effectiveness standards and shall also focus on efficient use of funding.
3) Promote public awareness and communication in order to build support for a long-term strategy to protect the Puget Sound.

More information regarding the Puget Sound Partnership is available on line at: http://www.psp.wa.gov/

6.1.3 WRIA 10 Watershed Action Committee

The Puyallup River watershed and part of the White River watershed are located in Water Resource Inventory Area (WRIA) 10. This WRIA is further divided into Upper Puyallup and Lower Puyallup Watershed Committees. The focus of both of these committees is to address water quality issues. Given the City of Fife's location within WRIA 10, the city would most likely work with the Lower Puyallup Watershed committee. The current focus of the Lower Puyallup Watershed Committee, as noted in the associated action plan, is to improve public involvement in replanting efforts along riparian zones. In addition, the Lower Puyallup Restoration Committee plans to establish a Puyallup River Basin Council. This council would provide recommendations for priority restoration projects and consult with coordinating agencies for project implementation.

6.1.4 Puyallup River Watershed Council

Formed in 1996, the Puyallup River Watershed Council (PRWC) includes representatives of local governments, businesses, elected officials, environmental agencies, non-profit groups and private citizens and is supported by the Pierce County Public Works and Utilities department. The defining goals of the PRWC are related to clean water, healthy native fish and wildlife, sustainable land use, viable agriculture and forestry, quality outdoor recreation, natural flow patterns and groundwater recharge, vegetated corridors, management of solid waste, resident education, and sustainable communities

More information on the Puyallup River Watershed Council is available at: http://www.piercecountywa.org/pc/services/home/environ/water/ps/prwc/main.htm.

6.1.5 Puyallup Tribe

The Puyallup Tribe has tribal trust land that is surrounded by the City of Fife jurisdiction. In addition, all of the Puyallup associated reaches within the City of Fife are directly adjacent to and reliant upon land under tribal jurisdiction, such as the Puyallup River waterward of the ordinary high water mark, the Sha-Dadx wetland and the hydrologic connection between the Radiance Oxbow wetland and the Puyallup River.

More information on the Puyallup Tribe is available at: http://www.puyallup-tribe.com/

6.1.6 Adjacent Jurisdictions

As a result of the Shoreline Master Program Update Process, adjacent jurisdictions including Pierce County, the City of Tacoma, and City of Milton may be available for partnership for restoration activities along the Hylebos (Pierce County, Tacoma, Milton) and the Puyallup River (Pierce County, City of Tacoma). In addition, the City may want to pursue joint efforts county wide for restoration of the Puyallup River with Pierce County and the cities of Puyallup, Orting and Sumner as well as other cities and towns adjacent to the Puyallup.

6.2 POTENTIAL FUNDING RESOURCES

The following table has been generated to summarize potential funding resources for restoration activities within the City. It is not intended to be an exhaustive list as new funding sources may become available and previously available funding sources may be exhausted during the life of this document.

Table 4: Potential Funding Resources

Grant Name	Allocating Entity	Contact
Aquatic Lands Enhancement Account	Washington State Recreation and Conservation Office	Kammi Bunes (RCO Conservation Grants for Fife area) Phone: (360) 902-3019 E-mail: kammie.bunes@rco.wa.gov Kim Sellers (RCO Conservation Grants for Fife area) Phone: (360) 902-3082 E-mail: kim.sellers@rco.wa.gov
Bring Back the Natives	National Fish and Wildlife Foundation	Krystyna Wolniakowski Phone: (503) 417-8700 E-mail: Krystyna.Wolniakowski@nfwf.org
Coastal and Estuarine Land Conservation Program	National Oceanic and Atmospheric Administration; local contacts at Ecology	Jeanne Koenings Phone: (360) 407-7258 E-mail: jkoe461@ecy.wa.gov Ms. Carrie Byron Phone: (360) 407-7509 E-mail: cbyr461@ecy.wa.gov
Estuarine and Salmon Restoration Program	Washington State Recreation and Conservation Office; Puget Sound Nearshore Partnership	Dave Caudill Phone: (360) 902-2649 Email: dave.caudill@rco.wa.gov
Five-Star Restoration Program	National Fish and Wildlife Foundation	Amanda Bassow Phone: (202) 857-0166 E-mail: Amanda.Bassow@nfwf.org
Land and Water Conservation Fund	Washington State Recreation and Conservation Office	Kammi Bunes (RCO Conservation Grants for Fife area) Phone: (360) 902-3019 E-mail: kammie.bunes@rco.wa.gov Kim Sellers (RCO Conservation Grants for Fife area) Phone: (360) 902-3082 E-mail: kim.sellers@rco.wa.gov
Salmon Recovery Funding Board	Washington State Recreation and Conservation Office	RCO Salmon Grants (Fife area) Dave Caudill E-mail: Dave.Caudill@rco.wa.gov (360) 902-2649
Salmon Recovery Funding Board Community Salmon Fund	National Fish and Wildlife Foundation	Cara Rose Phone: (503) 417-8700 E-mail: Cara.Rose@nfwf.org

Grant Name	Allocating Entity	Contact
Water Quality Grants and Loans	Washington Department of Ecology	Anne Dettelbach Phone: (425) 649-7093 E-mail: adet461@ecy.wa.gov Rachel McCrea, Phone: (425) 649-7223 E-mail rmcc461@ecy.wa.gov
Washington Wildlife and Recreation Program	Washington State Recreation and Conservation Office	RCO Recreation Grants (Fife area) Karl Jacobs Phone: (360) 902-3084 E-mail: karl.jacobs@rco.wa.gov
Wildlife and Habitat Conservation Fund	National Fish and Wildlife Foundation	Krystyna Wolniakowski Phone: (503) 417-8700 E-mail: Krystyna.Wolniakowski@nfwf.org
State Wildlife Action Project	National Wildlife Federation	Naomi Edelson Phone: (202) 797-6889 E-mail: edelsonn@nwf.org

6.3 MECHANISMS AND STRATEGIES FOR IMPLEMENTING A SUCCESSFUL RESTORATION PLAN

Although general restoration concepts have been identified for the City of Fife, no specific restoration projects and/or programs have been identified to the extent that specific implementation mechanisms can be planned nor can responsible parties be identified. However general implementation and evaluation techniques can be addressed and therefore these elements are described below:

- Project monitoring should generally a requirement for any mitigation action that addresses development impacts.
- For restoration project (i.e. those that do not have a mitigation component), appropriate monitoring be should conducted in order to demonstrate that the project has generated the desired result.
- In the case of ongoing invasive species removal and revegetation actions, continued coordination with volunteer groups can be invaluable and should be supplemented with regular documentation of both effort and outcome.

6.3.1 Implementation

The following combination of non-regulatory measures and strategies are considered to be the most effective for implementing the restoration framework within the City:

- Creation of a stakeholder plan/group
- Volunteer Coordination
- Coordination with Parks development

- Generate incentives for developers to invest in shoreline restoration.

6.4 TIMELINES AND BENCHMARKS

Restoration of shoreline function, both the planning processes and the implementation of a restoration plan, are necessary efforts that must be undertaken with thought to the long term, whether the project is completed in the short term or requires long term action. Due to the lack of specific restoration projects, limitations as a result of required levee maintenance and private property ownership as well as the need to ensure adaptive management can occur, it is difficult to establish concrete timelines and measurable benchmarks for this restoration plan which can be used to evaluate its effectiveness. General anticipated timelines for potential restoration projects are included in Table 3.

The City intends to use the next update process, which must be completed in 2021 [Engrossed Substitute House Bill (ESHB) 1478] to determine the level of progress the city has been able to achieve in meeting the identified restoration goals.

The exact structure of this review process has not been determined by City of Fife nor has guidance from the Department of Ecology been generated at this time. However, this review process may include the following elements:

- Identifying planning efforts and implementation of restoration projects undertaken within this Shoreline Master Program.

- Evaluating the identified restoration goals, policies and priorities and determining their effectiveness.

- Revising the goals, policies and priorities as needed to accomplish the restoration goals as identified during that update process.

6.4.1 Evaluation of Restoration

The City of Fife intends to use the following methods to review of the effectiveness of projects and programs developed pursuant to this Shoreline Restoration Plan in meeting overall restoration goals:

- Tracking no net loss indicators

- Collection of GIS data – the collection and use of GIS data can provide users with easy access to information.

7 REFERENCES

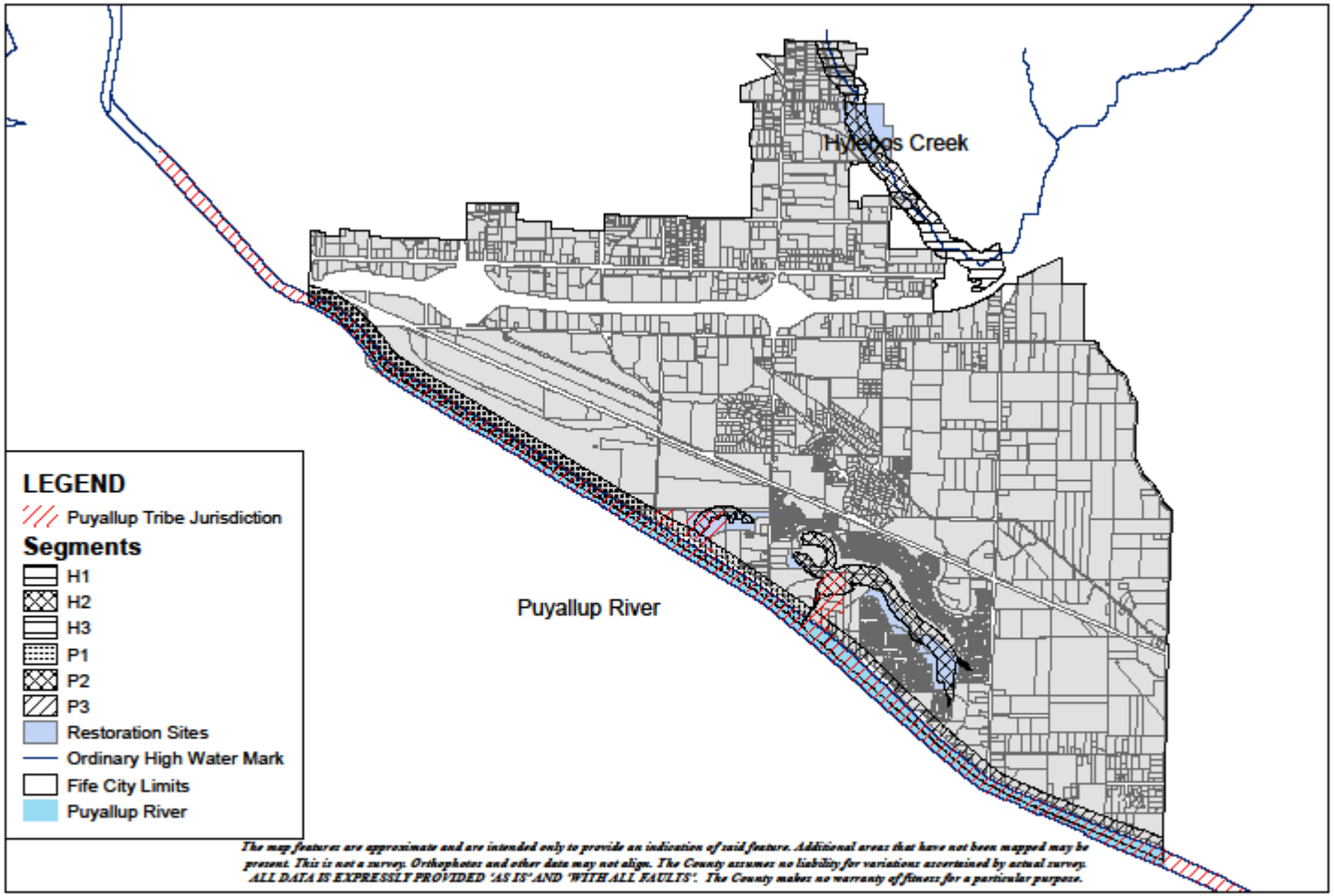
Grette Associates. 2010a. City of Fife Shoreline Master Program Update: Inventory and Characterization. Prepared for the City of Fife. September 2010.

Grette Associates. 2011. City of Fife Shoreline Master Program Update: Draft Cumulative Impacts Analysis. Prepared for the City of Fife. June 2011.

Kerwin, J. Salmon Habitat Limiting Factors Report for the Puyallup River Basin (Water Resource Inventory Area 10). Washington Conservation Commission, Olympia, Washington. 1999.

CITY OF FIFE
SHORELINE MASTER PROGRAM UPDATE

RESTORATION PLAN EXHIBITS



Source: Pierce County and City of Fife GIS data

FIGURE 14

Restoration Sites
Fife Shoreline Master Plan
Fife, WA