DRAFT

APPENDIX A: RESTORATION PLAN

June 12, 2012

City of
OLYMPIA

ACKNOWLEDGEMENTS

Olympia City Council

Stephen Buxbaum, Mayor
Nathaniel Jones, Mayor Pro Tem
Jim Cooper
Julie Hankins
Steve Langer
Jeannine Roe
Karen Rogers

Olympia Planning Commission

Amy Tousley, Chair
Larry Leveen, Vice Chair
Judy Bardin
Roger Horn
Paul Ingman
Agnieszka Kisza
Jerome Parker
James Reddick
Rob Richards

Former Members: Mark Derricott, Carol Law, Thomas Muller, Jeanne Marie Thomas, and Richard Wolf

Steve Hall, City Manager
Keith Stahley, Director of Community Planning and Development
Rich Hoey, Water Resources Manager
Dave Okerlund, Program Manager
Cari Hornbein, Senior Planner
Laura Keehan, Associate Planner
Nancy Lenzi, Office Specialist
Darren Nienaber, Deputy City Attorney
David Hanna, Assistant Parks Director
Todd Stamm, Planning Manager
Andy Haub, Engineering and Planning Supervisor
Michelle Stevie, Senior Program Specialist
Whitney Bowerman, GIS Analyst

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NOTE TO READER

This draft represents the recommendations of the Planning Commission. Revisions noted in "track changes" are the most recent changes that did not receive final action by the Planning Commission prior to March 28, 2012.

CHAPTER 1: INTRODUCTION

For cities containing any shorelines with impaired ecological functions, Shoreline Master Programs shall include goals, policies, and actions for restoration of such impaired ecological functions (WAC 173-26-186(8)(c).) Specific goals and actions for restoration, as well as existing policies and programs contributing to restoration, shall be identified in an implementable document with a scientifically based prioritization framework. For the City of Olympia, this document is intended to be supportive of planning efforts, and it is expected that this document will be dynamic and able to be updated and amended as existing conditions, scientific data, lead entities, and funding sources develop and evolve.

Restoration is defined under the shoreline guidelines as *"reestablishment or upgrading of impaired ecological shoreline processes or functions."* While the plan is intended to achieve overall improvements in shoreline ecological functions over time, it is important to note that is in reference to status upon adoption of the master program, and does not imply returning shoreline areas to aboriginal or pre-European settlement conditions.

The existing *Shoreline Master Program for the Thurston Region* was adopted in 1976, and was comprehensively updated in 1984 and 1990. The existing Program does not address restoration in a specific chapter or component. The minimal restoration requirements that were addressed were primarily included in the Urban Waterfront Plan (1993) as Mitigation and Enhancement regulations.

To meet current Shoreline Master Program requirements, at a minimum the Restoration Plan must consider and address the following subjects (WAC 173-26-201(2)(f)):

- Identify degraded areas, impaired ecological functions, and sites with potential for ecological restoration;
- Establish overall goals and priorities for restoration of degraded areas and impaired ecological functions;
- 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;
- Identify additional projects and programs needed to achieve local restoration goals, and implementation strategies including identifying prospective funding sources for those projects and programs;
- Identify timelines and benchmarks for implementing restoration projects and programs and achieving local restoration goals;
  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.

Inclusive of the elements listed above, the Restoration Plan is intended to identify shoreline, or areas upland that impact shorelines, that need to be restored to a healthy and functioning condition. The Plan is for the purpose of identifying potential projects and programs that would contribute or achieve restoration for those degraded areas, and can serve as a resource for government agencies, non-profit organizations, new development contractors, and others who need or want to identify potential restoration projects.

CHAPTER 2: SHORELINE INVENTORY SUMMARY

A Shoreline Inventory prepared by Thurston County Regional Planning Council (TRPC) and Shoreline Analysis and Characterization Report prepared by ESA (2008) for TRPC, provide the technical and scientific basis for establishing restoration goals, objectives, and priorities. Specifically, the Shoreline Analysis & Characterization Report provides documentation that assists in identifying existing conditions, evaluating existing functions and values of shoreline resources, and exploring the opportunities for conservation and restoration.

2.1. Shoreline Jurisdiction

The provisions of the Shoreline Program apply to all shorelines of the state, all shorelines of statewide significance and shorelands as defined in RCW 90.58.030. Shorelines under SMA jurisdiction within the City of Olympia, not including Olympia Urban Growth Area (UGA), include: Budd Inlet, Black Lake Drainage Ditch, Percival Creek, Capitol Lake, Chambers Lake, Grass Lake, Ken Lake, and Ward Lake.

2.2. Inventory

A. Budd Inlet

Budd Inlet is located at the southernmost end of South Puget Sound. It encompasses both the West Bay and East Bay sub-basins within the Deschutes River watershed, and includes several marinas and an international shipping port. For the surrounding community, Budd Inlet is a source of economic and tourism revenue, outdoor recreation, cultural identity, and a visually stunning backdrop for daily life.

1. Existing Land Use

Land uses within city limits along Budd Inlet vary greatly. The shoreline of Budd Inlet is zoned into multiple land-use categories, including commercial, government (Port of Olympia), industrial, moderate density single-family residential, multifamily residential, and parks.

Future development is shifting from industrial uses to mixed-use residential and commercial predominantly along West Bay Drive, and the eastern portion of the Port Peninsula. Redevelopment downtown is also likely to occur. The largest parcels of undeveloped or underdeveloped property exist along West Bay drive, approximately half of which have been light or heavy industrial uses that are no longer in use. Other lands are either owned by the City of Olympia Parks, Arts and Recreation Department, or the Port of Olympia.

2. Parks and Open Space/ Public Access

Priest Point Park: Priest Point Park is a 314-acre city park that came into city ownership in 1905. Priest Point has the most intact natural shoreline conditions found in lower Budd Inlet. In particular, the steep slopes along the shoreline provide beach sediment for forage fish, the Ellis Cove estuary is relatively intact with a salmon-bearing stream, there are approximately 4.4 acres of wetland, and quality riparian vegetation is found along the shoreline.

The park offers a combination of formal landscaped areas with play areas, picnic shelters, a rose garden, and miles of trails through predominantly second-growth forest. Visitors also have access to beaches with views of downtown and west Olympia.

West Bay Park: West Bay Park is 17-acres located along the shoreline on the west side of West Bay. A Washington Wildlife and Recreation Program Water Access Grant and an Aquatic Lands Enhancement Grant helped to fund acquisition, development and shoreline enhancement of intertidal and riparian areas. Public access includes a hand held boat launch.

Percival Landing: Percival Landing is a prominent pedestrian boardwalk shoreline path located on the east side of Budd Bay in downtown Olympia. Constructed in 1978, the wooden timbered boardwalk is one of Olympia's premier attractions and main venues for public access to Budd Inlet.

In 2004, the Percival Landing boardwalk structure was inspected by marine engineers who found that the wooden creosote pilings, framing and planks were succumbing to rot and marine organisms. In 2006, a Percival Landing Concept Plan was approved by the Olympia City Council to redesign the park to withstand periods of inundation due to sea-level rise, and to restore the environmental, cultural, and historic values of the shoreline. Planned improvements include a new boardwalk, multiuse flex-space, two interpretive pavilions, and restroom facilities. Additionally, overwater structures will be reduced, and over an acre of shoreline habitat will be restored.

East Bay Waterfront Park: This 1.86-acre park offers benches, interpretive signage, and views of Budd Inlet. Some riparian vegetation restoration efforts are underway to improve the shoreline.

Public Access: Other access points to Budd Inlet include a number of Port of Olympia and privately owned marinas, Port Plaza, the 5th Ave dam, and Seven Oars Art Site, a pocket park located near the west end of the 4th Ave Bridge, and a viewing area on East Bay Drive.

3. Shoreline Modifications

As a heavily developed shoreline with a functioning international port, over 90% of the shoreline of Budd Inlet within the city is significantly modified with armoring, and a large portion of downtown is located directly on fill. As noted above, the Percival Landing boardwalk is an overwater structure. West Bay has been modified with historical industrial uses and other development projects from the base of Budd Inlet to the West Bay Marina. The majority of East Bay Drive private residences have armored shorelines. Budd Inlet includes ten small docks, and three significant and three additional smaller marinas.

4. Biological Resources and Critical Areas

Budd Inlet, despite being highly modified includes a variety of critical areas, and critical saltwater habitat. Priest Point Park has the highest levels of intact and beneficial critical areas and saltwater habitat, including salt marsh, riparian shoreline, estuarine conditions, steep slopes and beach sediment, and a salmon bearing stream.

Salmon have been confirmed in Mission, Moxlie, and Schneider Creeks, which all empty into Budd Inlet. Forage fish spawning grounds and habitat is along Priest Point Park and

small sections of the west shoreline. The Port Lagoon, a functioning wetland with patchy salt marsh, is subject to a Federal Fish and Wildlife conservation easement.

B. Freshwater Streams and Rivers

The only freshwater streams and rivers regulated under SMA in Olympia are Black Lake Drainage Ditch and Percival Creek. Black Lake Drainage Ditch was constructed in 1922 to drain potential agricultural land north of Black Lake. Black Lake Meadows refers to an adjacent city-owned stormwater facility and natural area. Originating from Black Lake, the ditch captures stormwater discharge from many of the commercial districts in west Olympia including from Yauger Park stormwater pond.

Percival Creek is fed by Black Lake Drainage Ditch and empties into Percival Cove, adjacent to Capitol Lake. Percival Creek was significantly altered by the construction of a section of Burlington Northern Santa Fe Railroad in the 1890's, and discharged directly into Budd Inlet until the construction of Capitol Lake in 1951. The railroad line still runs along the north edge of the creek from Percival Cove to Mottman Road. Percival Creek runs through the campus of South Puget Sound Community College, however, only the portion of the creek below its confluence with Black Lake Drainage Ditch and outside the campus is within the jurisdiction of SMA.

1. Existing Land Use

The land-use designations surrounding Black Lake Drainage Ditch are limited to open space, Black Lake Meadows, a storm pond and open space tract owned and managed by the City of Olympia Storm and Surface Water Utility, and a small amount of industrial and residential parcels.

The shorelines along the 1.2 miles of Percival Creek within SMA jurisdiction include a wide variety of land-use categories, including Open Space, High Density Residential, Commercial, and Industrial. Outside the canyon, much of the land in the vicinity of Percival Creek is developed.

2. Parks and Open Space/ Public Access

The shorelines of Black Lake Drainage Ditch are primarily located within an open space and storm pond tract owned and managed by the City of Olympia. No formal public access is available. There are currently no plans to establish a park or public access. Shorelines not under public ownership are adjacent to private property. Ease of access and proximity to west Olympia commercial centers allows for the establishment of homeless encampments within the riparian corridor.

There is no existing formal public access to Percival Creek. Future plans include transitioning the existing privately owned Burlington Northern Santa Fe Railroad into a shared-use trail for public use and access to the Percival Creek canyon. Due to already existing ease of access to the canyon from Deschutes Parkway, a significant number of homeless people establish camps within the riparian corridor.

3. Shoreline Modifications

Black Lake Drainage Ditch is an artificial drainage ditch, and largely functions as a stormwater capture for many of the commercial districts in West Olympia. As noted previously, the construction of the Burlington Northern Santa Fe Railroad in the 1890s

was the first major alteration of the Percival Creek stream channel. The railroad defines the northern edge of the creek. The construction of Black Lake Ditch in 1922 greatly increased the amount of flow into Percival Creek. An estuary at the mouth of the Creek as it discharged into Budd Inlet was lost with the construction of Capitol Lake in 1951. Surrounded by urban development, Percival Creek is highly altered by a system of stormwater ponds and pipes conveying surface water throughout the basin. Highway 101 and Cooper Point Rd. cross over Percival Creek on high bridges, and one mile from Percival Cove, there is a pedestrian bridge crossing.

4. Biological Resources and Critical Areas

Very few critical areas are associated with Black Lake Drainage Ditch within the City of Olympia. While over 160 acres of wetlands are associated with the Ditch in Tumwater, the shorelines under Olympia's jurisdiction are only adjacent to a constructed stormwater facility. The Ditch has been identified as supporting Chinook, Coho, and Chum, with an occasional sighting of a Sockeye salmon. Black Lake Meadows is rich in bird diversity, with a large variety of pond and nesting habitat.

The Percival Creek Canyon is dominated by steep slopes on the south side of the creek, which at times exceed 60%. North of the railroad grade, the slopes are more moderate. Emergent wetlands are colonizing new fill at the mouth of the creek, which was greatly modified with the construction of Capitol Lake. Percival Creek has been identified as supporting Chinook, Coho, Chum salmon, and Cutthroat trout. The Chinook are of hatchery origin.

C. Lakes

Capitol Lake, Ken Lake, Chambers Lake, Grass Lake, and Ward Lake are regulated as SMA shorelines. The area that is now Capitol Lake was once an integral part of Budd Inlet, consisting of intertidal mudflats that typically form at the mouths of estuaries. An earthen dam, concrete spillway, and bridge were constructed in 1951, blocking the tidal exchange with Budd Inlet and flooding the mudflats to form Capitol Lake.

Ken Lake and Ward Lake have a high level of surrounding residential development. Chambers Lake within Olympia is buffered by an extensive wetland, however the shoreline within the City of Lacey is intensely residential. Grass Lake, which is also almost entirely within the city's Grass Lake Refuge, is also surrounded predominantly by a system of wetlands.

1. Existing Land Use

As a focal point for the City of Olympia, and an integral aspect of the Capitol Campus, Capitol Lake is currently surrounded by a variety of land-use designations including commercial, mixed-use, government (Capitol Campus), Parks, and Moderate to High Density Residential. Sixty-seven percent of the shoreline is managed by Washington State General Administration. Future development is expected to increase commercial and residential densities in the downtown core near the lake.

Chambers Lake and Ward Lake are both currently surrounded by a variety of land-uses that include low to moderate density single-family residential, agriculture land, and park and open space. More residential development is expected near these lakes. A 105-acre Urban Village, Briggs Village, will add an additional 234 lots (a mix of residential,

commercial, and multi-family) to the west side of Ward Lake. A city park is planned for a portion of the southern end of the lake.

The shoreline of 26-acre Ken Lake is entirely low to moderate density residential or single-family homes, including two private community beaches. This is unlikely to change in the future.

The 64-acre Grass Lake and Lake Louise system is almost entirely within Grass Lake Refuge, owned and managed by the City of Olympia as a park and open space. Those shorelines not within the refuge are rural, moderate, and high density residential, or commercial. Residential development will continue in the surrounding areas, but will be limited to "low impact" development.

2. Parks and Open Space/ Public Access

The shoreline of Capitol Lake has an extensive network of parks, trails, and viewpoints. Public access is encouraged and integral to the management of the lake. Parks, trails, and other access points include the Capitol Lake Interpretive Center in Tumwater, Heritage Park, Marathon Park, and the 5th Avenue Dam, which provides overlooks to the lake. All public access points are owned and managed by Washington State General Administration.

Chambers Lake is accessed by the public at a Washington Department of Fish & Wildlife (WDFW) Boat Launch. With the City of Lacey, the Chehalis-Western Trail, a former railroad that has been converted to a regional trail, bisects the west and east basins of the lake.

Ward Lake also has one (WDFW) Boat Launch, and three privately owned accesses for residential developments: Holiday Hills, The Cove, and Briggs Village. The City of Olympia owns undeveloped property on the southern end of the lake to be developed as a future park.

Access to Ken Lake is limited to the residents of Lakemoor Homeowner's Association, who jointly own two private community beaches.

As noted previously, Grass Lake and Lake Louise are almost entirely within Grass Lake Refuge, owned and managed by the City of Olympia as a park and open space. A walking trail circulates through the refuge, and includes a view point for Lake Louise. Plans include future installation of a shared-use trail with interpretive signage, an outdoor instruction area, and a wildlife viewing blind.

3. Shoreline Modifications

Capitol Lake has extensive shoreline modifications. Interstate 5 crosses the lake on a bridge and fill. Deschutes Parkway lies on fill on the west side of the lake. The shoreline of Heritage Park is a concrete bulkhead. Burlington Northern Santa Fe railroad track and trail on fill separates the North and Middle Basins, including an adjacent pedestrian bridge. Three small docks currently exist, and a public pier is located at the Interpretive Center.

With the exception of the former railroad right-of-way, very little shoreline modifications have taken place at Chambers Lake. Ward Lake and Ken Lake have both been modified with the addition of residential landscaped yards and 48 and 32 private docks, respectively. Additionally, Ken Lake was originally dredged with construction of the surrounding subdivision to enhance recreation in the lake. A portion of Grass Lake known as Lake Louise was once mined as a peat bog, but has since been left to return to a natural system.

4. Biological Resources and Critical Areas

High quality riparian shoreline exists along the east shore of the Middle Basin of Capitol Lake, and the west shore of Percival Cove. The wooded hillside of Capitol Lake is the largest connected habitat unit within Olympia. Bald eagle habitat is located within the basin. Heritage Park has been designed and landscaped to provide flood protection to downtown Olympia. Steep slopes can be found along the eastern shore of the middle basin, and the west shore of Percival Cove. Steep slopes are also found west of Deschutes Parkway in the middle and north basins, and to the southeast and south of Heritage Park in the north basin. Capitol Lake has been found to support populations of Chinook, Coho, Steelhead, and Cutthroat salmon. Also identified are Stihel barb and mud minnow.

In 2001, Eurasian water milfoil, an exotic aquatic plant, was discovered in the lake. In summer 2004, the herbicide triclopyr was applied to the lake to control the milfoil infestation. In 2005, some surviving milfoil plants were discovered in the south basin and in the wetland near the Interpretive Center. A number of different agencies, including Washington State General Administration and WDFW are currently responding to the discovery of the New Zealand mud snail in late 2009. Large populations of the 1/8-1/4 inch long snails can consume up to half of the available food in a water body, starving out insects essential to trout and salmon.

Chambers Lake has an extensive variety of wetland habitats surrounding it. Emergent wetlands surround the south isthmus between the basins and the south and east shore of the West Basin. Much of the west shore of the West Basin is surrounded by scrub shrub wetland. The northwest arm of the West Basin supports a unique wetland with acidic organic soils.

As a kettle lake, Ward Lake is spring-fed, occupying a closed pothole with no surface feeder streams, and no surface outlet. Steep slopes can be found on the west, north, and eastern shores of the lake. There exists over a half acre forested wetland in the southeast corner of the lake.

Ken Lake has no noted biological resources or critical areas.

Grass Lake Refuge, surrounding Grass Lake and Lake Louise, is one the largest intact habitat units within Olympia. Wood ducks, mud minnow, and a two-acre stand of Quaking Aspen have been identified as priority habitat and species within the refuge. Along the shorelines there is extensive scrub shrub wetland interspersed with forested, smaller patches of emergent and open water habitats. The lakes and refuge are habitat for a rich variety of bird species.

CHAPTER 3: RESTORATION GOALS AND OBJECTIVES

The goals identified in this Restoration Plan reflect an effort to achieve no net loss and overall improvements in shoreline ecological functions over time (WAC 173-26-221). Due to Olympia's location at the southernmost tip of Puget Sound, the goals and objectives identified are significantly influenced by the existing conditions of the marine shorelines of Budd Inlet.

As the largest shoreline city in Thurston County, Olympia plays a key role in the condition of Budd Inlet, and recent evaluations of Puget Sound describe a heavily altered and vulnerable biological system. Due to its location at the terminus of Puget Sound, Budd Inlet is especially susceptible to water quality impacts. Northern areas of Puget Sound benefit from strong hydrologic and chemical interactions with the Pacific Ocean. South Puget Sound, including Budd Inlet, is unique in that it provides extensive areas of shallow waters in concert with complex, lengthy shorelines; consequently, adjacent lands interact with and influence the south sound more readily and to a greater degree.

Understanding that the overall health of Budd Inlet also correlates directly to the condition of those shorelines (lakes, streams, wetlands, etc.) that drain into the inlet, the goals listed below, while seemingly focused solely on marine shorelines, simultaneously apply to freshwater river, stream, and lake shorelines as well.

3.1. Restoration Overall Goals

a) ***Improve water quality in Budd Inlet and its tributaries.*** Improving water quality is necessary to protect and enhance native wildlife and vegetation habitat, restore opportunities for aquaculture, and ensure safe and healthy recreation opportunities. Improving water quality will require a comprehensive, multi-pronged, proactive approach that incorporates a variety of tools including stormwater treatment retrofits, public education, low impact development, sanitary sewer expansion, community-based programs, and site-specific restoration efforts.

b) ***Improve natural sediment processes.*** Improving natural sediment processes is necessary for healthy aquatic habitat, and is achieved in part by minimizing bulkheads, protecting and enhancing estuaries, creating salt marsh environments, and re-vegetating shorelines.

c) ***Preservation and restoration of wildlife habitat.*** The South Puget Sound's diverse shoreline habitat and numerous stream corridors support or have the potential to support populations of native fish, shellfish, amphibians, and birds. With ready access to natural areas and educational programming, Olympians desire protection of existing wildlife habitat and restoration of those areas that have the potential to support or promote the recovery of a native wildlife population.

d) ***Restore shorelines as opportunities for humans to connect with the natural environment.*** When designing and implementing restoration of shorelines, consider the desire and potential for human inclusiveness; provide access and learning experiences for people to feel welcome, engaged, and invested in the natural and restored environment.

3.2. Restoration Objectives for Budd Inlet

a) Preserve and restore estuarine habitat. Subtidal and intertidal mudflats and salt marshes provide transition habitat between fresh and salt water environments.
b) Enable natural wave energy attenuation, which is restricted by the hardening of shorelines with bulkheads, revetments, docks, etc.

c) Improve sediment generation and transport. Bluff erosion processes have been modified as structures (roads, railroads, piers, docks, and bulkheads) at the toe have reduced the frequency of tidal and wave interaction with bluffs.
d) Improve water quality. Reduction in wetland area has reduced contact time of water with soil, lowering the potential for filtering and cycling of pollutants, which adhere to soil particles. Reduce or eliminate upland sources of pollutants, which have increased as a result of urban and industrial land uses within and near the shoreline, and subsequently, are the result of an increase in stormwater runoff.
e) Preserve and restore wildlife habitat. Shoreline vegetation provides habitat for invertebrates, birds, amphibians, reptiles, and mammals.
f) Increase sources and delivery of large woody debris. Removal of mature trees from riparian areas, and from surrounding bluffs has significantly reduced the source of large woody debris to the shoreline.

3.3. Restoration Objectives for Rivers and Streams

a) Preserve and restore estuarine habitat. Shoreline modifications, such as the introduction of fill, culverts, and dams, have disrupted naturally occurring estuaries. Changes in flow regime due to changing land uses have modified timing and quantities of freshwater flows.
b) Regulate seasonal flows. Upstream land uses and development have resulted in less water flowing during the summer low-flow periods.
c) Restore natural sediment generation and transport processes. Due to build-up and wash-off from urban, agricultural industrial land uses, an increasing amount of fine sediment is being transported. An Increase in local impervious surfaces is contributing to greater and more frequent flood events, which results in an increase in incidents of stream bank erosion and channelization.
d) Improve water quality. Upland sources of pathogens and toxins have increased significantly as a result of urban and industrial land uses. Potential storage has decreased through the loss of wetlands and subsequently a reduction in water to soil contact. The increasing installation of impervious surfaces also results in more urban flooding, often resulting in urban stormwater runoff flowing directly into rivers and streams.
e) Preserve and restore wildlife habitat. Vegetation provides structure for invertebrates, birds, amphibians, reptiles, and mammals.
f) Increase sources and delivery of large woody debris. Removal of mature trees from riparian areas has significantly reduced the source of large woody debris, which provides structure for streams, readily utilized by fish and other wildlife.

3.4. Restoration Objectives for Lakes

a) Restore natural sediment retention patterns. Fine sediment loading is elevated due to land cover alterations and increased impervious surface.
b) Improve water quality. Reduction in wetland area and lacustrine floodplain connection has reduced water contact time with soil, lowering the potential for filtering and cycling of pollutants. Upland sources of pathogens and toxins have increased significantly as a result of urban and industrial land uses, resulting in the growth of invasive aquatic plants and algae, phosphorous loading, and increased water temperatures.
c) Preserve and restore wildlife habitat. Vegetation provides structure for invertebrates, birds, amphibians, reptiles, and mammals.
d) Increase sources and delivery of large woody debris. Removal of mature trees has significantly reduced the source of large woody debris.

CHAPTER 4: EXISTING AND ONGOING RESTORATION PROJECTS AND PROGRAMS

4.1. Comprehensive Plan Policies

The City of Olympia's current Comprehensive Plan was adopted by the City Council in 1994 after a three-year community involvement effort. Olympia is currently undergoing an extensive periodic update process, which is slated to be completed in 2012. The Shoreline Master Program update currently underway, and will be made consistent with the update of the Comprehensive Plan in 2012.

The existing Comprehensive Plan contains a number of general and specific goals and policies that direct the City to permit and condition development with consideration for the enhancement and preservation of the natural environment, as well as the preservation and development of public access opportunities. Specific relevant goals and policies include:

Land Use

Policy 6.6 Provide incentives for restoring degraded wetlands, stream corridors, estuarine shorelines, and other important natural systems.

Policy 6.7 Protect the viability and productivity of Budd Inlet's marine habitat, water quality, water-dependent uses, public access, and views, from degradation and loss.

a. Permit over-the-water construction on a limited basis, consistent with the Shoreline Master Program for the Thurston Region and the Urban Waterfront Plan.

b. Protect Budd Inlet from unnecessary landfills:

(1) Allow minimal filling of tidelands, consistent with the Shoreline Master Program for the Thurston Region, only as required to: a) Promote access for recreational uses; or b) Make the MacFarland-Cascade site environmentally safe; or c) Allow construction of a fourth shipping berth at the north end of the Port Peninsula; or d) To accomplish a project expressly approved by the City upon finding that:

(a) The project is a water-dependent or water-related use (as defined by the Shoreline Master Program for the Thurston Region), or is necessary to solve environmental degradation problems;
(b) The size of the proposed area to be filled is the minimum possible to accomplish the project;
(c) The benefits of filling cannot reasonably be achieved by other alternatives;
(d) The predicted community benefits exceed the project's environmental impacts, including any adverse impacts upon affected neighborhoods; and
(e) Any loss of habitat is appropriately mitigated.

(2) When evaluating the need for filling a tideland, consider such factors as whether the proposed fill would:

(a) Lead to increased traffic congestion;
(b) Detract from Olympia's waterfront orientation and the potential for tourism;
(c) Further limit the flushing action of Budd Inlet, making it harder to protect water quality, especially respective of the LOTT treatment plant outfall and recreational uses;
(d) Intensify residential and industrial conflicts;
(e) Reduce or degrade fish and wildlife habitat, particularly for rearing and migrating salmon;
(f) Impede the public's right of navigation; or
(g) Harm the environment.

Any such adverse impacts may be grounds for mitigation or denial of a proposal.

(3) It is the intent of the provisions above to end acceptance of landfill as the inevitable fate of Budd Inlet and to impose on any proposed landfill project the standards of "highest necessity."

c. Regulate development so that it does not prevent or unduly impede established or planned public access to Budd Inlet, particularly in the vicinity of the Port Lagoon on West Bay.

Policy 6.8 Reduce the rate of impervious surface expansion in the community.

Policy 6.9 Olympia will consider and as appropriate may require mitigation of environmental impacts to other public agencies and jurisdictions that may result from development actions within the City.

Policy 18.13 The Port should exercise environmental stewardship. This entails:
(a) Assuring that all activities which involve the Port are conducted in a manner which protects the environment;
(b) Cleaning up areas or sources of pollution on Port property;
(c) Participating in the restoration of the natural environment on and around Port property, where appropriate;
(d) Acquiring and protecting such properties as may serve the goals of the Port for mitigation, enhancement, and restoration; and
(e) By implementing a pollution prevention program.

Policy 18.14 The Port should work closely with Olympia to offset the risks of contamination to Budd Inlet by Port activities.

<u>Environmental</u>
Goal 3 Regional surface and groundwater is conserved, protected, and meets or exceeds all standards for quality and sustainable supply.

Policy 3.10	Carefully control shoreline development to prevent or minimize shoreline erosion, prevent pollution discharges into marine waters, and protect shoreline aesthetics and habitat, as consistent with the Shoreline Master Program, and other local, state, and Federal regulations and policies.
Goal 6	Olympia fully cooperates with inter-jurisdictional and regional efforts to manage natural resources and address common environmental issues.
Policy 6.1	Participate in cooperative storm and surface water, groundwater management and protection efforts among federal, tribal, state, local jurisdictions and community organizations on an aquifer, watershed or regional basis.

<u>Parks, Arts and Recreation</u>

Goal 4	Preserve open space or unique landforms as part of the Olympia area's landscape, character, and overall contribution to urban form and character.
Policy 4.3	Preserve undeveloped lands that provide public access to fresh and marine water beaches.
Policy 4.6	Design open space to define the community, to create outdoor spaces, to protect wildlife habitat and the natural environment, and to create public and civic spaces.
Goal 5	Manage City-owned open space and parks as beneficial places for wildlife.
Policy 5.3	Incorporate habitat considerations in design and development of new parks, parks scheduled for renovation, and in approvals for private developments. Encourage use of plants that attract wildlife to City-owned parks, open space, and landscaping areas.
Policy 6.3	Increase public access to all major water bodies regulated under the Shoreline Master Program for the Thurston Region.

A specific section of the Comprehensive Plan is dedicated to West Bay Drive due to the existing and potential environmental, cultural, and economic benefits of the shoreline:

"Conditions in the West Bay Drive area represent a challenging mix of opportunities and constraints. The shallow waters along this shoreline provide crucial habitat for young salmon when they first leave the Deschutes River basin and enter salt water. Birds, marine mammals, upland mammals and other wildlife species are relatively common for this urban location. Several sites along the shore are significant in Squaxin Island Tribal cultural history…Today's waterfront businesses include a mix of industry and recreation. This plan's ambitious vision is for a vibrant mix of light industrial, office, restaurant, commercial, recreational, and residential uses for this urban waterfront location, along with improved habitat for fish and wildlife."

4.2. Critical Areas Regulations

The City of Olympia Critical Areas Regulations can be found in Olympia Municipal Code Chapter 18.32. Critical areas protection was originally adopted in 1992 and revised in 2005. The intent of the Critical Areas Ordinance is to implement the State of Washington Growth Management Act and its guidelines, the Countywide Planning Policies, and the Olympia Comprehensive Plan by accomplishing the following related to environmental preservation:

1. Protecting critical areas and the functions they perform by regulating their development;
2. Maintaining groundwater recharge and preventing the contamination of groundwater resources;
3. Minimizing damage due to landslides, seismic events, erosion or flooding;
4. Protecting natural flood control and stormwater storage from alterations to drainage or stream flow patterns;
5. Protect wildlife habitat and species where possible throughout the City;
6. Controlling siltation, protecting nutrient reserves and maintaining stream flows and stream quality for fish and marine shellfish;
7. Protecting areas with high potential for marine aquaculture activities from degradation by other types of uses;
8. Minimizing turbidity and pollution of wetlands, streams and fish-bearing waters and maintaining their associated wildlife habitat; and
9. Achieving no overall net loss in acreage and functions of the City's remaining wetlands.

The current regulations categorize streams into five types based on documented salmonid fish use, with standard buffers ranging from 50 feet for streams in ravines to 250 feet for Type 1 streams (shorelines of the State). Standard wetland buffers now range from 50 to 250 feet and are classified using the Department of Ecology's latest *Washington State Rating System for Western Washington*. Management of the City's critical areas using these regulations should help insure that ecological functions and values are not degraded, and impacts to critical areas are mitigated. These Critical Areas Regulations are one important tool that will help the City meet its protection and restoration goals. The City's Critical Areas Regulations are adopted by reference into the Shoreline Master Program to regulate critical areas found within the shoreline area, and, if there is a conflict, the more restrictive regulation would apply.

4.3. Shoreline Master Program

The existing *Shoreline Master Program for the Thurston Region* was adopted in 1976, and was comprehensively updated in 1984 and 1990. Thurston Regional Planning Council authored and up until recently, maintained the regional shoreline master program for Olympia and six neighboring jurisdictions.

While not distinguished as a required component of the existing Shoreline Master Program, restoration requirements are addressed in an Urban Waterfront Plan (1993) as Mitigation and Enhancement regulations. The Urban Waterfront Plan addressed only overwater development on the shorelines of Budd Inlet. Specific policies and subsequent regulations addressing mitigation and enhancements are outlined in Section 4 (I) and Section 5 (10), and include the following:

1. All adverse impacts to fish and wildlife habitat, its functions, values, and acreage, should be mitigated and enhancements made such that the net result of the project is not worsening such conditions

2. Guidelines and standards for mitigation and enhancements should be established in order of preference.
3. A project proposal that includes a less preferred mitigation approach should meet a comprehensive set of standards that assure the public interest is served by the proposal such that the net result is no net loss of habitat function, value, or acreage.
4. The applicant is financially responsible for additional mitigation and enhancement action should any element of the Mitigation and Enhancement Plan fail.
5. The City of Olympia should establish a Habitat Advisory Committee, consisting of experts in the disciplines of fish or wildlife habitat, to review required habitat Mitigation and Enhancement Plans in a consistent and coordinated manner and make recommendations regarding approval to the Olympia Environmental Review Officer.
6. Where habitat is altered, the project applicants should restore or create equivalent areas of habitat in order to compensate for habitat losses.
7. The City should approve a Mitigation and Enhancement Plan as a condition of issuance of any permit which impacts habitat.
8. Mitigation should generally be implemented concurrently with the regulated activity under the permit.
9. In general, on-site mitigation should be required.
10. If adverse impacts cannot be mitigated, permits should be denied.

In 2003, the Washington State Department of Ecology adopted guidelines which required that all local jurisdictions in the state update their Shoreline Master Programs. Ecology sequenced the adoption of the SMP's to fit the seven year comprehensive plan update cycle required by the state Growth Management Act. The deadline for all local jurisdictions within the Thurston region to update their SMP's is December 2011. The SMP update is currently underway, and will be made consistent with the update of the Comprehensive Plan in 2012.

4.4. Storm and Surface Water Utility

Stormwater in Olympia is handled through a system of storm drains, pipes, ponds, and drainage ditches, and much of the water eventually reaches one of the City's eight stream systems, four major lakes, or Budd Inlet. Subsequently, the City of Olympia Storm and Surface Water Utility ("Utility") plays a significant role in ensuring the protection and restoration of Olympia's water bodies. The three goals of the Utility are to:

- Reduce the frequency and severity of flooding so hazards are eliminated, except during major storm events. The Utility will minimize potential flooding associated with new development through regulations for on-site stormwater systems. Flooding arising from existing inadequate public infrastructure will be addressed in a timely manner.
- Improve water quality in all degraded streams and wetlands while maintaining high quality conditions in Green Cove basin. Improvements in water quality will be measurable and result in improved stream health. Olympia drainage basins are managed based on the degree to which water quality is currently impacted by human actions. Unique management approaches are designed to minimize specific impacts in each basin.
- Slow the decline of aquatic habitat health in all degraded streams and wetlands, while protecting healthy habitat from additional impacts as measured by levels of biotic diversity. The relationship between aquatic habitat conditions and land use impacts in urbanizing basins is scientifically complex and managerially challenging. Efforts include protecting high quality habitats while providing tangible improvements to other systems. Community engagement in

environmental issues and the incorporation of innovative development techniques is key to achieving success in Olympia's aquatic habitat goals.

A. Operations and Maintenance

Olympia's stormwater operations crews clean and maintain approximately 130 miles of storm pipe, 3,000 storm drains, and 40 public stormwater retention facilities. Additionally, city staff oversees a program that requires commercial property owners with private stormwater systems to perform regular maintenance and cleaning of their system. The Utility regulates and provides technical assistance to Homeowner's Associations and Neighborhood Associations, who are pond owners as well. These combined actions result in fewer pollutants and sediments entering Olympia's waterways. In addition to the Utility's maintenance and operations activities, the following programs specifically contribute to cleaner water in Olympia's streams, lakes, and Puget Sound.

B. Western Washington Phase II Municipal Stormwater Permit

All stormwater runoff flowing through Olympia's pipes, ponds, and ditches is managed according to the requirements of a permit issued by the Washington State Department of Ecology in January of 2007. The Permit stems from the federal Clean Water Act and shares its intent to restore and maintain the chemical, physical, and biological integrity of our nation's waters. Each year, the permit requires the City to take actions like; educating the public and encouraging non-polluting behaviors, looking for illegal dumping and cross-connections, enforcing erosion and sediment control at construction sites, and using best practices for land management and stormwater system maintenance.

C. 2009 Drainage Design and Erosion Control Manual

Olympia adopted its 2009 Drainage Design and Erosion Control Manual in compliance with the Phase II Municipal Stormwater Permit issued by the Washington State Department of Ecology. The manual fulfills permit requirements for equivalency with the 2005 WDOE Manual. The objectives of the manual are to provide the requirements and design guidance for new and redevelopment stormwater quantity and quality control, so the stormwater generated by these developments complies with water quality standards and sustains healthy fish and wildlife habitat in receiving waters.

D. Public Education

The Utility supports a robust public involvement and education program. The program provides educational and volunteer opportunities for the Olympia community. A few specific programs include:

- Involvement in Stream Team, an inter-jurisdictional education-to-action program for citizens interested in protecting and enhancing local streams, lakes, and Puget Sound. Stream Team frequently implements educational planting activities for participants.
- OLYWater Schools Program for 4th or 5th graders focuses on providing education and training opportunities to improve students' knowledge of local water resources, as well as motivate them to change behaviors that adversely affect water and habitat quality.
- Salmon Stewards trains and organizes volunteers to provide interpretive information about salmon life cycle and recovery at key locations during salmon migrations.

E. Critical Habitat Land Acquisition and Management

The Utility purchases and manages parcels of land throughout Olympia that contribute to water quality and the preservation of critical aquatic habitat. For successful acquisition, the Utility seeks to utilize opportunities to partner with other agencies and willing property sellers to acquire land. Parcels are identified for acquisition because of a unique or valuable aspect of habitat, including wetlands, which

when intact and functioning or when restored are integral to the management of stormwater. Altogether, approximately 15 acres have been acquired for preservation.

F. Seasonal Vegetation Management Crew

The Utility annually hires seasonal staff who implement vegetation management and maintenance practices aimed at restoring or improving the habitat and natural function of these properties. Those practices include invasive vegetation removal, riparian vegetation installation, and maintenance of stormwater facilities to ensure ongoing function.

G. Restoration Projects and Invasive Species Removal

The Utility has been involved in many restoration projects at numerous locations and scales. Often utilizing volunteers and students, projects have included re-vegetating and maintaining vegetation in riparian areas and invasive species removal in riparian and upland areas. Other projects have replaced deteriorating instream culverts and stabilized erosive landslide areas adjacent to streams. Specific recent projects include the following:

- The City of Olympia retrofitted a rain garden on Division Street to improve water quality to Schneider Creek. Completed in 2008, the benefits include: flood flow retention, removal of pollutants and sediment, and increased vegetation for habitat. Rain gardens also promote groundwater recharge.
- The City of Olympia has installed a substantial amount of native plantings on a portion of West Bay Park designated as the 4th Ave Bridge mitigation site. Revegetation with native plantings promotes flood flow retention, and provides erosion control and storage of phosphorus and nitrogen while providing habitat for wildlife.
- The City of Olympia purchased and enhanced 42 acres of impacted wetlands adjacent to Black Lake Drainage Ditch in 1995. Properly functioning wetlands promote flood flow retention, as well as removal of pollutants/sediment through sedimentation and adsorption, thus mitigating upland sediment generation. Wetlands also contribute to groundwater recharge and low summer flows while providing shoreline habitat for wildlife such as invertebrates, birds, amphibians, reptiles, and mammals.
- In partnership with Washington Trout and the Thurston Community Salmon Fund, the City of Olympia installed four small log structures adjacent to the bank of Black Lake Drainage Ditch. Providing a source of large woody debris for the ditch promotes habitat complexity and provides a sink for sediment.
- Five rain gardens have been installed on public land in Olympia, and the Utility continues to support their installation by private property owners by offering educational trainings and often providing small grants.
- In 2010, the City removed invasive vegetation, stabilized slopes, and re-vegetated with native vegetation 4,500 sq. ft. of land at the headwaters of Garfield Creek. Prior to the restoration, the undeveloped lot was riddled with garbage from illegal dumping and homeless encampments.
- In 2010, the City completed a succession planting of native species over 120,000 sq. ft. of stream bank along Black Lake Drainage Ditch, and installed live stakes along 25,000 square feet of stream bank.

H. Capital Improvement Projects

The Utility has also designed and implemented a number of infrastructure improvement projects that will result in improved water quality or stormwater management. Completed in 2008 with a percentage of funds from the Dept. of Ecology, the Decatur low impact development project retrofitted stormwater management along 600 feet of Decatur Street, which flows to Schneider Creek. Low impact roadway development contributes to the infiltration properties of the underlying soil. Additionally, in 2001, an improvement project to R.W. Johnson Road included installation of pervious pavement and an improved culvert to enhance salmon access to Black Lake Drainage Ditch.

Constructed in 2011, the Yauger Park Expansion Phase 1 project expanded the stormwater storage capacity of Yauger Park. New development on the west side of Olympia has necessitated the expansion of the stormwater facility. The expansion restored the disturbed area with landscaping, providing for the recreational use of the facility and expansion area during dry periods. Landscaping will primarily be composed of native vegetation. A future second phase of expansion is planned.

I. Stream Monitoring

Local stream monitoring is performed through a regional water quality program supported by Olympia and its neighboring jurisdictions and administered by Thurston County. The program focuses on high priority streams, collecting water quality data, precipitation and creek flow data, and macro invertebrate samples. City staff collects additional macro invertebrate and water quality data from lower priority streams using volunteer help from students and citizens. Thurston County prepares a biannual report that includes data, trend analysis and comparisons with State water quality standards. This information aids the Utility in determining priority areas for possible habitat restoration or stormwater treatment projects.

J. Low Impact Development Research and Planning

Olympia has been a leader in the state for researching, developing, and implementing new low impact technologies, such as porous and pervious pavements, and bioswale and rain garden installations. The Decatur Street LID Project was completed in 2005 and tested the performance and costs of three different low impact street paving designs. A Porous Sidewalk Maintenance Comparison Study and an Impervious Surface Reduction Study have also been completed.

Currently, with the help of the City's Utility Advisory Committee, the City is evaluating priorities to better meet long-term goals of flood management, water quality improvement, and aquatic habitat enhancement utilizing a detailed GIS analysis of impervious surfaces, forest cover, water quality, macro invertebrate health, and other parameters. With this work, the many traits of the City and its natural environment that affect Budd Inlet have been quantified.

The City recently completed a comprehensive summary of existing low-impact development (LID) projects in Olympia, LID projects in other cities, and draft Department of Ecology (Ecology) requirements. Staff also completed a detailed analysis of the strengths and challenges associated with specific LID techniques in Olympia and recommended implementation.

K. *Sea-Level Rise Analysis and Planning*

January 2012, City of Olympia staff presented a sea-level rise update to the community. The update contained findings from the first phase of an in-depth analysis of the anticipated affects of sea-level rise

on the Olympia shoreline and potential engineering-based solutions. Work thus far has determined that Olympia is most vulnerable downtown due to increased instances of urban flooding. Future phases are anticipated to include continued analysis of solutions and funding resources.

4.5. Septic to Sewer Conversion Program

There are approximately 4,200 existing septic systems in Olympia and its Urban Growth Areas. Septic systems can pose a threat to public and environmental health, particularly when systems are damaged or poorly maintained. In order to gradually convert onsite sewage systems to gravity sewer service, the City of Olympia Wastewater Utility implements a septic to sewer conversion program. The program is voluntary and provides incentives for residential connection of septic systems to sanitary sewer as well as cost recovery mechanisms for the City to make sewer extension projects possible. The City waives the sewer general facility charge for properties that make a connection within two years of notification of sewer's availability. The first conversion under this program was implemented in 2010.

4.6. Olympia Arts, Parks and Recreation

A. Parks Stewardship Program

The Park Stewardship Program offers City of Olympia community members opportunities to volunteer for work parties. Tools, gloves, and refreshments are provided for volunteers who participate in maintaining trails, removing invasive species (such as ivy, Scot's Broom, and Himalayan blackberry), and planting new trees and shrubs. There is also a growing offering of recreational and environmental outdoor experiences and classes that focus heavily on environmental stewardship.

B. Integrated Pest Management & Chemical Free Parks

The mission of Parks, Arts & Recreation Pest Management Program is to control pests that are harmful to the health or aesthetic value of park plantings in a manner that is cost effective, safe, and environmentally responsible. The City Council adopted an Integrated Pest Management Plan for park facilities in 2006. Since implementation, the Department has reduced reliance on chemicals once thought to be critical to maintaining parks. At present, the Department uses limited amounts of glyphosate (Round-Up) and synthetic fertilizers on some parks, while many parks are now "chemical free" with no herbicides, pesticides, or synthetic fertilizers used at all. The City also works closely with the Thurston County Noxious Weed Program to eradicate noxious weeds, some of which must be removed under county mandate.

C. Park Development & Renovation

Acquisition and development of the new 4-acre West Bay Park on the west shoreline of Budd Inlet included extensive shoreline intertidal and riparian habitat reconstruction and enhancement, invasive vegetation removal, improved public access, and toxic clean-up. Phase II will include similar enhancements to the remaining undeveloped 13 acres in the future.

In 2004, the City performed a structural analysis of Percival Landing that revealed the need for major repairs and replacements. This created an opportunity for the City to look at not only repairing the Landing but enhancing it. A Concept Design Plan was completed in January 2006. That incorporated input from consultants, a project artist, staff, the community, advisory committees, and the Squaxin Island Tribe. Phase I is complete, which included the removal of the existing overwater boardwalk structure, approximately 200 creosoted pilings, impervious surface area, and included over an acre of reconstructed shoreline to function as a native habitat.

4.7. LOTT Alliance

The LOTT Alliance is a partnership between Lacey, Olympia, Tumwater, and Thurston County to provide wastewater management and reclaimed water production services for the urbanized area of north Thurston County. LOTT invests in capital projects to help preserve and protect public health, the environment, and water resources. LOTT specifically invests in water conservation, water quality and habitat improvement projects in the Deschutes River watershed, including Budd Inlet, as compensation for being allowed to increase wintertime discharges from the treatment plant to Budd Inlet. The Gull Harbor Estuary is an example of a specific mitigation site in which LOTT has been involved in restoration and preservation activities.

4.8. Squaxin Island Tribe

The Squaxin Island Tribe is a historic steward and a conscientious co-manager and protector of natural resources. The Tribe works in cooperation with numerous federal, state and county government agencies and organizations to participate in natural resources enhancement and protection programs.

The Squaxin Island Tribe recently completed an extensive assessment of nearshore habitat restoration opportunities in Budd Inlet. The assessment builds on prior studies and was guided by an expert panel of scientists very knowledgeable on the unique conditions in Budd Inlet. The analysis considers the dynamic interplay of the shoreline and upland contributing areas, and assesses likelihood of success for restoration projects over time. The work emphasizes the importance of physical improvements to the shoreline (minimize bulkheads, re-establish estuaries, re-vegetate) that will enhance marine sediment transport mechanisms as well as water quality improvements in upland areas.

Over 100 recommended restoration projects were identified across the inlet. In heavily urbanized areas, where both shoreline and upland areas have been highly modified, the analysis suggested that clustering of restoration projects is necessary to increase likelihood of successful outcomes. City and Tribal staff met in 2010 to review the Tribe's analysis and discuss implementation opportunities. Restoration projects identified by the Tribe were integrated into Chapter 5: Additional Projects and Programs to Achieve Local Restoration Goals.

4.9. Thurston Conservation District

The Thurston Conservation District promotes voluntary stewardship among private landowners in Thurston County. Conservation Districts (CDs) are legal subdivisions of state government that administer programs to conserve natural resources. The Thurston County District conducts, oversees and participates in various restoration projects throughout Thurston County. Specifically, the district works to restore 'riparian habitats' (any habitats near water) since these areas are crucial for the health of all wildlife, especially 'salmonids' (salmon and trout).

The Conservation District and the City of Olympia have partnered multiple times to restore riparian habitat at city-owned and managed stormwater ponds. Revegetation with native species helps promote flood flow retention, provides erosion control, wildlife habitat, and storage of phosphorus and nitrogen with potential for future large woody debris deposits.

In addition, Thurston Conservation District serves as the Lead Entity for Water Resource Inventory Area (WRIA) 13. Under the Washington Administrative Code 173-500-040 and the Water Resources Act of 1971, Revised Code of Washington 90.54, the major watershed basins of Washington State were divided into 62 WRIA's. The Lead Entity works at the watershed level to develop a strategic plan to guide the

selection and ranking of restoration and protection projects based on the input of a technical committee (made up of local experts that are knowledgeable about the local watershed, habitat and fish conditions) and a citizens committee (made up of local, state, federal and tribal government representatives, community groups, environmental and fisheries groups, conservation districts and regional fisheries enhancement groups).

The Lead Entity serves a critical role as the bridge that combines science based priorities and community priorities to effectively determine projects for proposals that will result in the most balanced socio-economic and technical information regarding salmon habitat protection and restoration.

4.10. Port of Olympia

A. Shipping Berth Pilot Interim Cleanup Action

The Washington Department of Ecology (Ecology) and the Port of Olympia (Port) agreed to allow the Port to remove a portion of dioxin-contaminated sediment from two shipping berths. The two agencies are partnering on efforts to continue testing of Budd Inlet sediments along the nearshore. Higher concentrations of dioxin, as anticipated, are being found nearest the Port berths and stormwater outfalls. The Port, as part of an updated agreement with Ecology in early 2012, is now conducting additional sediment investigations in the East and West Bays. Testing will lead to development of a cleanup plan.

B. Cascade Pole

Cascade Pole operated a wood treatment plant on the site from the 1930s to the 1980s. Creosote, a mixture of several different chemicals used to preserve wood, was released to the environment during the plant's operation. Soil and groundwater were contaminated as a result. The Port has been working on cleaning up the Cascade Pole site for several years. Ecology and Cascade Pole entered into a legal agreement in 1990 to begin cleaning up pollution at the site. Since that time, the Port of Olympia has taken over responsibility for the cleanup. Ecology and the Port have entered into several legal agreements to continue with cleanup efforts. The Port implemented interim actions to remove and cover contaminated soil in the North Point area in 2010, including installation of a new $3.5 million dollar on-site treatment plant.

4.11. Budd Inlet Restoration Partnership

The Budd Inlet Restoration Partnership is a collaboration of the cities of Olympia and Tumwater, Thurston County, Port of Olympia, and the LOTT Clean Water Alliance, aimed at improving the health and vitality of Budd Inlet. Phase I work, including an assessment of current efforts and solicitation of public input, was completed in 2008.

The Partnership is now working under a Phase II grant from Ecology. Key activities covered under the Phase II scope of work include:

- Support for the nearshore habitat assessment completed by the Squaxin Island Tribe;
- Development of an integrated map of Budd Inlet showing habitat types, public access and recreation points, cleanup sites, zoning, and development activity;
- Identification of approaches to off-site, out-of-kind, and in-kind aquatic permit mitigation; and
- Evaluation of potential structural models for regional restoration efforts.

The future focus and vision for the Budd Inlet Restoration Partnership is still a work in progress. Staff is hopeful that the work under Phase II will help set the stage for more regional leadership and coordination on restoration efforts.

4.12. South Puget Sound Salmon Enhancement Group

The South Puget Sound Salmon Enhancement Group (SPSSEG) is a 501(c)(3) non-profit organization committed to protecting and restoring salmon populations and aquatic habitat with an emphasis on ecosystem function through scientifically informed projects, community education, and volunteer involvement. Part of their mission is to seek out and work in cooperation with other organizations to help plan, fund, carry out, and monitor fishery enhancement and habitat restoration projects. Habitat improvement projects have included: engineered log jams, bulkhead removal, installation of riparian plantings, culvert removal, and other fish passage barrier removals.

The SPSSEG has completed fish passage inventories for WRIA's 13 (Olympia) and 14. The inventories provided a comprehensive survey of all in-stream structures, including culverts, dams, fish-ways, etc., on public and private lands. SPSSEG used the Washington Department of Fish and Wildlife's (WDFW) Fish Passage criteria to determine barrier status. These inventories are the basis for prioritization of fish passage barrier removal projects.

4.13. Salmon Recovery Funding Board

Created in 1999 by the Washington State Legislature, the Salmon Recovery Funding Board (SRFB) provides grant funds to protect or restore salmon habitat and assist in related activities. It works closely with local watershed groups known as lead entities. The board is composed of five citizens appointed by the Governor and five state agency directors. SRFB supports salmon recovery by funding habitat protection and restoration projects. It also supports related programs and activities that produce sustainable and measurable benefits for fish and their habitat. SRFB has helped finance over 900 projects.

4.14. Puget Sound Partnership

The Puget Sound Partnership is a community effort of citizens, governments, tribes, scientists, and businesses working together to restore and protect Puget Sound. Its Action Agenda prioritizes cleanup and improvement projects, coordinates federal, state, local, tribal, and private resources, and encourages jurisdictions, non-governmental organizations, and other entities to work cooperatively toward a shared set of goals. A draft Action Agenda and Biennial Science Work Plan was released for public comment in December 2011, with the final document scheduled for completion in April 2012. The Action Agenda will focus on strategies for reducing five pressures on Puget Sound: land development, shoreline alteration, runoff from the built environment, wastewater, and loss of floodplain function.

4.15. Capitol Land Trust

The Capitol Land Trust conserves important wildlife habitat and natural areas by accepting donations of conservation easements and gifts of land, or by working with partners to purchase lands. Since 1989, Capitol Land Trust has been instrumental in permanently conserving 3,796 acres in Mason, Grays Harbor and Thurston Counties, with 859 of those acres acquired in 2009. The Capitol Land Trust strategic goals specify preservation of marine shorelines, estuaries, and wetlands. A focus area for the organization has

been conserving marine shoreline along Eld Inlet, and wetlands within the Green Cove Basin west of Olympia.

4.16. People for Puget Sound

People for Puget Sound is actively leading efforts to re-vegetate 450 linear feet of marine shoreline on the east bay of Budd Inlet in Olympia. The non-profit organization has engaged the East Bay Neighborhood Association and community volunteers in native plant installations and invasive vegetation control at the site since 2008, and are currently partnering with the City to develop onsite educational signage. People for Puget Sound has also been involved in early efforts supporting future restoration of the Deschutes Estuary and other South Sound restoration sites located on Eld Inlet, Henderson Inlet, and in Tacoma.

4.17. Department of Ecology

A. Deschutes/Capitol Lake/Budd Inlet TMDL process

The Deschutes River/Capitol Lake/Budd Inlet system is classified as an impaired water body under Section 303d of the federal Clean Water Act. In response, the Washington State Department of Ecology (Ecology) initiated technical evaluations in 2003 to determine the main sources of pollution and to determine how much water quality needs to be improved to keep the watershed healthy. This involves setting Total Maximum Daily Loads (or TMDLs) for contaminants of concern, including nutrients, fecal bacteria, temperature, dissolved oxygen, and fine sediment.

The technical evaluations set the stage for the development of a cleanup plan and related public review process. Once the cleanup is approved by EPA, provisions within the plan will be binding. City Storm and Surface Water staff is actively participating in Ecology's TMDL process, along with staff from other regional jurisdictions.

B. Toxics Cleanup Program

Accidental spills of dangerous materials and past business practices have contaminated land and water throughout the state. The Washington State Toxics Cleanup Program works to remedy these situations, which range from cleaning up contamination from leaking underground storage tanks, to large, complex projects requiring engineered solutions. Clean-up sites located in or near Olympia shorelines are listed in Table 4.17.

Table 4.17: Department of Ecology Toxics Clean-up Sites Located Within or near City of Olympia Shorelines.

Site	Date Added to List	Affected Shoreline	Status
West Bay Marina (2100 West Bay Drive NW)	January 2008	Budd Inlet	Remedial investigation underway
Hardel Mutual Plywood (1210 West Bay Drive NW)	July 2007	Budd Inlet	Contaminated soil and free product removal (Summer 2010)
Reliable Steel (1218 West Bay Drive NW)	May 2006	Budd Inlet	Remedial investigation underway
Industrial Petroleum (1117 West Bay Drive NW)	1998	Budd Inlet	Remedial investigation underway
Solid Wood Incorporated	July 2008	Budd Inlet	Interim actions

(900 West Bay Drive NW)			completed on 4 acres (West Bay Park Phase I)
East Bay Redevelopment (915 Washington Street NE)	February 2008	Budd Inlet	Interim Actions underway
Cascade Pole (1503 Marine Dr.)	1990	Budd Inlet	Soil excavation and capping (Summer 2010)
Budd Inlet Sediments Investigation	September 2010	Budd Inlet	Sediment sampling near Priest Point Park (Summer 2010)
Briggs Nursery (4407 Henderson Boulevard SE)	2004	Ward Lake	Site cleanup nearly complete.

4.18. Puget Sound Nearshore Estuary Restoration Project (PSNERP)

PSNERP is a large-scale General Investigation (GI) funded by the U.S. Army Corps of Engineers and the Washington State Department of Fish and Wildlife, with support from other state and local entities. Its mission is to restore and protect the nearshore habitat of Puget Sound, with goals to identify, fund, and undertake construction projects that restore ecosystem heath.

PSNERP is currently in its feasibility study phase, having identified a broad list of candidate habitat restoration projects across Puget Sound. A total of five projects were identified in Budd Inlet; the largest being the Deschutes River Estuary Restoration. Three of the five projects fall on City of Olympia property. As the property owner, City staff is currently working with PSNERP on the further scoping and feasibility work on:

- Restoration of the Garfield Creek estuary adjacent to West Bay Park;
- Creation of salt marsh beds at the mouth of Indian/Moxlie Creek in East Bay; and

Removal of a berm across the mouth of Mission Creek is moving forward with the Port of Olympia as the lead partner and funding source. Once scoping and feasibility work is complete on the remaining two projects, PSNERP plans to take a proposal to Congress for possible federal funding. Most recently, PSNERP published a restoration and protection planning model for managing Puget Sound nearshore ecosystems: Strategies for Nearshore Protection and Restoration in Puget Sound.

CHAPTER 5: ADDITIONAL PROJECTS AND PROGRAMS TO ACHIEVE LOCAL RESTORATION GOALS

The following additional projects and programs are organized into three categories: Budd Inlet, Freshwater Streams and Rivers, and Lakes. For each, a general discussion of potential programs precedes a table that lists specific identified projects. Projects and programs identified vary in scale, feasibility, and potential lead entity. The projects listed are not inclusive of every potential restoration project that would benefit the health and condition of shorelines, but are those that have been identified at this time that are scientifically sound, beneficial, and reasonably feasible within the next ten years. The following projects lists are also not limited to within 200 feet of a shoreline, but may be implemented elsewhere and still have significant impact on the health and viability of a shoreline, lake, river, or Budd Inlet.

5.1. Restoration Projects for Budd Inlet

A comprehensive list of projects intended at restoring Budd Inlet was identified by the Squaxin Island Tribe and included in the report *Budd Inlet Restoration and Conservation Planning* (2010). As noted in Section D, the Squaxin Island Tribe completed an extensive assessment of nearshore habitat restoration opportunities in Budd Inlet. The assessment built on prior studies and was guided by an expert panel of scientists very familiar with the unique conditions in Budd Inlet. Of those projects, 53 were identified in or within 500 feet of the City of Olympia.

Of those 53 projects, Table 5.1 includes 27 that have been identified as potentially feasible for evaluation or implementation within the next 10 years with the City of Olympia as the lead or partner agency. The three projects being studied for feasibility by PSNERP are also included. See Figure 5.1 for project locations.

Table 5.1: Budd Inlet Restoration Projects Which May be Implemented Within 10 Years.
The projects included in this table are a subset of restoration projects identified for implementation in Budd Inlet by the Squaxin Island Tribe, and documented in Budd Inlet Restoration and Conservation Planning (2010).

Location (Project ID)	Planned Project Description	Implementation Schedule	Potential Funding Source or Commitment	Restored Processes & Functions
West Bay (1)	Reconstruct the mouth of Garfield Creek and estuary.	Feasibility completed in 2011, with implementation to be determined by funding availability	Puget Sound Nearshore Estuary Restoration Project (PSNERP)	Provide transition habitat and improve water quality.
West Bay (2)	Daylight 250 feet of Garfield Creek through West Bay Park.	2014-2020	City of Olympia—Parks, Arts & Recreation	Restore natural sediment generation and transportation processes, enhance fish passage, increase delivery of large woody debris.

Location (Project ID)	Planned Project Description	Implementation Schedule	Potential Funding Source or Commitment	Restored Processes & Functions
East Bay (3)	Plant 2,300 linear feet of shoreline to create a functional riparian zone.	To be determined by funding availability	City of Olympia—Storm and Surface Water Utility	Restore wildlife habitat, improve water quality, increase sources of large woody debris, and enable natural wave energy attenuation and sedimentation generation and transport.
East Bay (4)	Reconstruct the mouth of Indian/Moxlie Creek and estuary.	Feasibility completed in 2011, with implementation to be determined by funding availability	Puget Sound Nearshore Estuary Restoration Project (PSNERP)	Provide transition habitat and improve water quality.
East Shoreline (5)	Restore the Mission Creek estuary.	Feasibility completed in 2011, with implementation in 2012	Port of Olympia	Provide transition habitat and improve water quality.
East Bay (6)	Plant approximately 1,500 feet of nearshore riparian vegetation along East Bay Drive.	To be determined by funding availability	City of Olympia	Restore wildlife habitat, improve water quality, increase sources of large woody debris, and enable natural wave energy attenuation and sedimentation generation and transport.
East Bay (7)	Plant approximately 4,200 linear feet of riparian vegetation.	To be determined by funding availability	City of Olympia	Restore wildlife habitat, improve water quality, increase sources of large woody debris, and enable natural wave energy attenuation and sedimentation generation and transport.
East Bay (8)	Add mussel rafts and Olympia	To be determined by funding	City of Olympia	Preserve and restore wildlife habitat, and

Location (Project ID)	Planned Project Description	Implementation Schedule	Potential Funding Source or Commitment	Restored Processes & Functions
	oyster beds to test effects of nutrient removal and reestablish populations. May also be implemented at other suitable locations.	availability		improve water quality.
West Bay (9)	Evaluate the planting of approximately 2,600 linear feet of vegetation along public property to create a functional riparian zone.	2010-2014	City of Olympia—Parks, Arts & Recreation	Restore wildlife habitat, improve water quality, increase sources of large woody debris, and enable natural wave energy attenuation and sedimentation generation and transport.
West Olympia (10)	Install a stormwater demonstration project.	2010-2014	City of Olympia—Storm and Surface Water Utility	Improve water quality.
East Shoreline (11)	Remove 378 feet of shoreline armoring and add large woody debris.	2011	City of Olympia/Thurston County	Provide priority habitat and a sediment source for a forage fish spawning beach.
West Bay (12)	Stabilize 3,000 ft. of channel to prevent erosion in Schneider Creek.	To be determined by funding availability	City of Olympia—Storm and Surface Water Utility	Improve water quality.
West Bay (13)	Plan for clean-up of toxics at Percival Landing.	To be determined by funding and/or redevelopment	City of Olympia-Parks, Arts, & Recreation	Improve water quality.
West Olympia (14)	Plan for clean-up of toxics at Division Nursery site.	To be determined by funding availability and/or redevelopment	Washington State Dept. of Ecology/Private Landowner	Improve water quality.
West Bay (15)	Plan for clean-up of toxics at Petroleum Distributers site.	To be determined by funding availability and/or redevelopment	Washington State Dept. of Ecology/Private Landowner	Improve water quality.

Location (Project ID)	Planned Project Description	Implementation Schedule	Potential Funding Source or Commitment	Restored Processes & Functions
East Olympia (16)	Plan for clean-up of toxics at East Side Laundry.	To be determined by funding availability and/or redevelopment	Washington State Dept. of Ecology/Private Landowner	Improve water quality.
East Olympia (17)	Plan for clean-up of toxics at Capitol City Studios.	To be determined by funding availability and/or redevelopment	Washington State Dept. of Ecology/Private Landowner	Improve water quality.
Downtown (18)	Plan for clean-up of toxics at Unocal site.	To be determined by funding availability and/or redevelopment	Washington State Dept. of Ecology/Private Landowner	Improve water quality.
Downtown (19)	Plan for clean-up of toxics at Clarion.	To be determined by funding availability and/or redevelopment	Washington State Dept. of Ecology/Private Landowner	Improve water quality.
Downtown (20)	Plan for clean-up of toxics at Warehouse One site.	To be determined by funding availability and/or redevelopment	Washington State Dept. of Ecology/Private Landowner	Improve water quality.
Downtown (21)	Plan for clean-up of toxics at Cascade Pole site.	Ongoing	Port of Olympia	Improve water quality.
West Bay (22)	Plan for clean-up of toxics at Texaco.	To be determined by funding availability and/or redevelopment	Washington State Dept. of Ecology/Port of Olympia	Improve water quality.
Downtown (23)	Plan for clean-up of toxics at Key Shop site.	To be determined by funding availability and/or redevelopment	Washington State Dept. of Ecology/Private Landowner	Improve water quality.
Downtown (24)	Plan for clean-up of toxics at parking lot site.	To be determined by funding availability and/or redevelopment	Washington State Dept. of Ecology/Private Landowner	Improve water quality.
Downtown (25)	Plan for clean-up of toxics at 8th Street site.	To be determined by funding availability and/or redevelopment	Washington State Dept. of Ecology/Private Landowner	Improve water quality.
Downtown (26)	Plan for clean-up of toxics at Pho restaurant.	To be determined by funding availability and/or redevelopment	Washington State Dept. of Ecology/Private Landowner	Improve water quality.

Location (Project ID)	Planned Project Description	Implementation Schedule	Potential Funding Source or Commitment	Restored Processes & Functions
West Bay (27)	Evaluate the removal of nearshore fill.	2010-2014, as redevelopment occurs	City of Olympia—Parks, Arts & Recreation.	Provide transition habitat and improve water quality.

Figure 5.1: Budd Inlet Restoration Projects Which May be Implemented Within 10 Years. See Table 5.1 for project details.

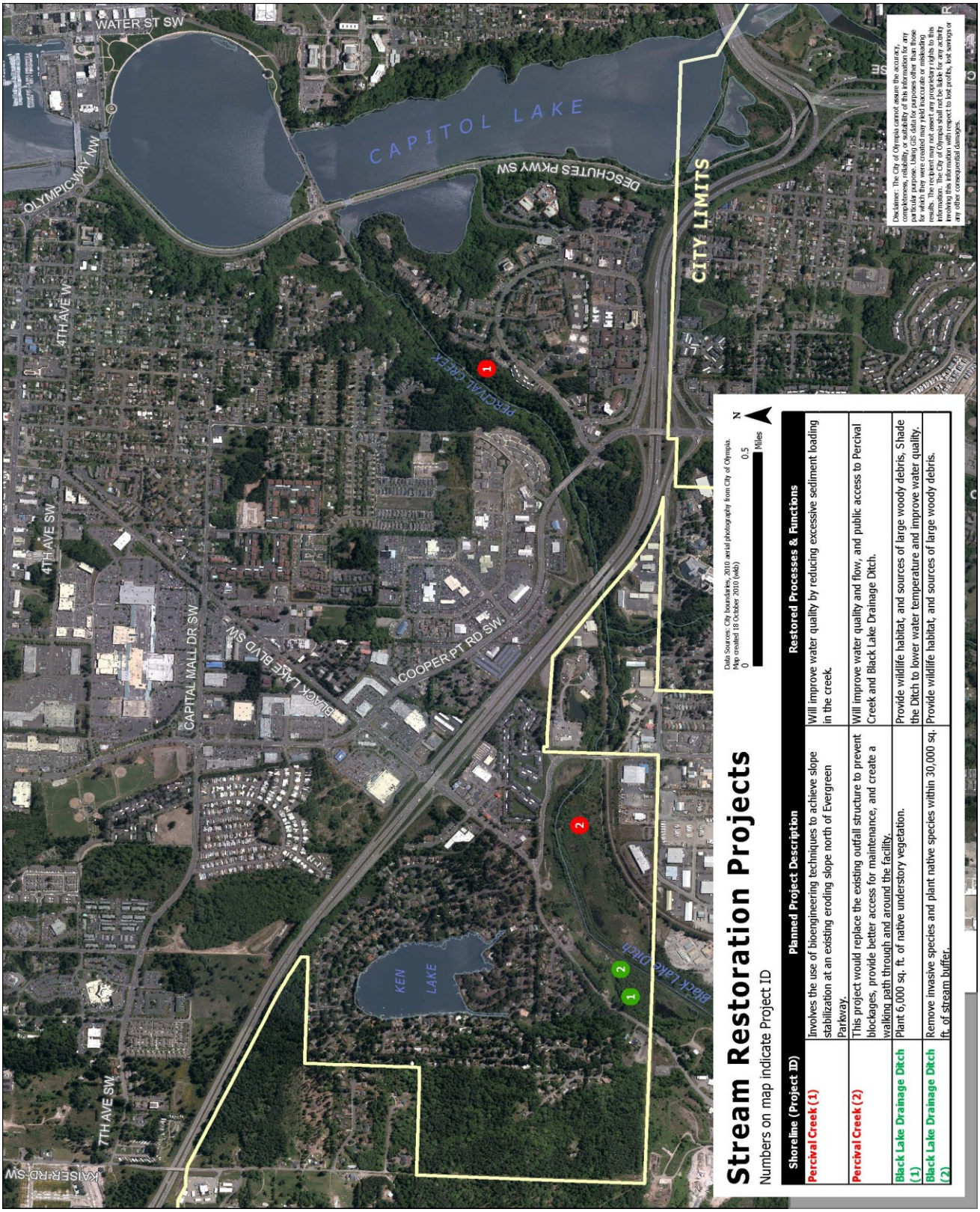
5.2. Restoration Projects for Freshwater Streams and Rivers

The City of Olympia Storm and Surface Water Utility has taken the lead on identifying and planning for future stream shoreline restoration projects. Three projects (Table 5.2) have been identified as contributing to achieving the overall goals and objectives for Percival Creek and Black Lake Drainage Ditch. See Figure 5.2 for project locations.

Table 5.2. Additional Restoration Projects, Implementation Schedules, and Potential Funding Sources for Freshwater Streams and Rivers.

Shoreline (Project ID)	Implementation Schedule	Potential Funding Source	Planned Project Description	Restored Processes & Functions
Percival Creek (1)	2012	City of Olympia—Storm and Surface Water Utility (Capital Facilities Plan)	Involves the use of bioengineering techniques to achieve slope stabilization at an existing eroding slope north of Evergreen Parkway.	Will improve water quality by reducing excessive sediment loading in the creek.
Percival Creek (2)	2013	City of Olympia—Storm and Surface Water Utility (Capital Facilities Plan)	This project would replace the existing outfall structure to prevent blockages, provide better access for maintenance.	Will improve water quality and flow, and public access to Percival Creek and Black Lake Drainage Ditch.
Black Lake Drainage Ditch (1)	2013	Grant Funding—Washington State Dept. of Ecology	Plant 150,000 sq. ft. of riparian vegetation.	Provide wildlife habitat, and sources of large woody debris, Shade the Ditch to lower water temperature and improve water quality.
Black Lake Drainage Ditch (2)	2013	Grant Funding—Washington State Dept. of Ecology	Remove invasive species and plant native species within 150,000 sq. ft. of stream buffer.	Provide wildlife habitat, and sources of large woody debris.

Figure 5.2. Locations for Restoration Projects for Freshwater Streams and Rivers.



Shoreline (Project ID)	Planned Project Description	Restored Processes & Functions
Percival Creek (1)	Involves the use of bioengineering techniques to achieve slope stabilization at an existing eroding slope north of Evergreen Parkway.	Will improve water quality by reducing excessive sediment loading in the creek.
Percival Creek (2)	This project would replace the existing outfall structure to prevent blockages, provide better access for maintenance, and create a walking path through and around the facility.	Will improve water quality and flow, and public access to Percival Creek and Black Lake Drainage Ditch.
Black Lake Drainage Ditch (1)	Plant 6,000 sq. ft. of native understory vegetation.	Provide wildlife habitat, and sources of large woody debris, Shade the Ditch to lower water temperature and improve water quality.
Black Lake Drainage Ditch (2)	Remove invasive species and plant native species within 30,000 sq. ft. of stream buffer.	Provide wildlife habitat, and sources of large woody debris.

5.3. Restoration Projects for Lakes

With the exception of Grass Lake, the remaining lakes regulated under the SMA are surrounded by residential properties. All are subject to many of the same environmental stressors, and can benefit from implementation and continuation of the following restoration programs:

A. The updated SMP, when completed and implemented in 2012, will include regulations that address vegetation conservation requirements specifically to protect and enhance riparian vegetation. The standards for docks will also be updated to include a requirement for the installation of grating, allowing for greater light penetration.

B. Existing education and outreach programs can be expanded through the new SMP update and through the existing Water Resources education framework in 2012 to include programs that address restoration, perhaps including the following topics:

- Shoreline Stewardship Workshops and outreach
- Riparian Landscaping Workshops and informational handouts
- Promote the planting of native trees
- Increase public awareness about healthy streams, rivers, and lakes
- Increase the participation of volunteers in city-wide restoration projects that directly benefit shorelines.

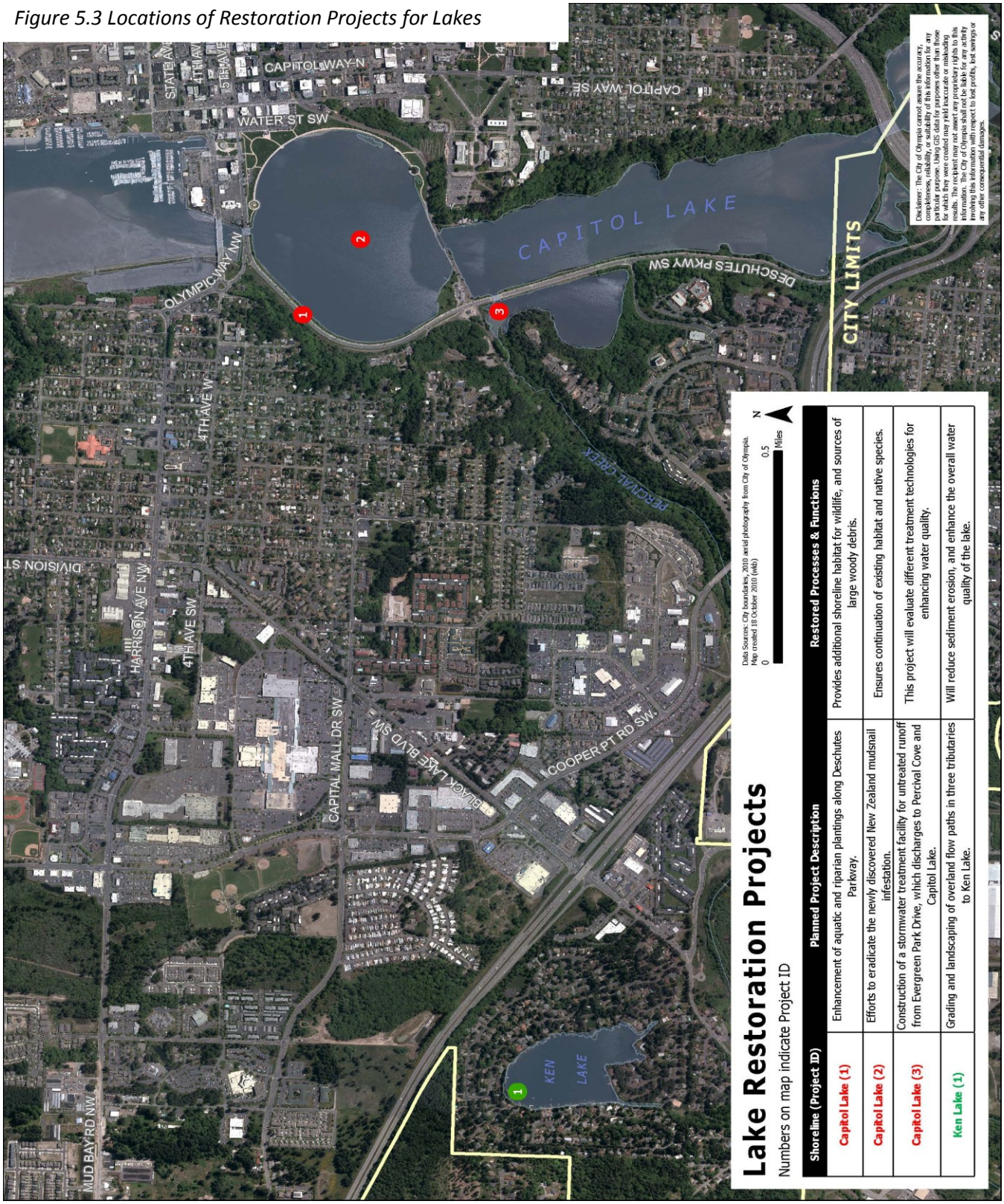
C. The City can explore ways in which to team with local property owners to replace existing armoring with a more natural shoreline that incorporates vegetation and woody debris. Whether through financial assistance, permit expedition, or guidance, it would be most beneficial to target multiple contiguous parcels. The implementation of this program would be ongoing.

Table 5.3 identifies specific restoration projects, implementation timelines, and potential funding sources for Capitol Lake and Ken Lake. See Figure 5.3 for project locations.

Table 5.3. Additional Restoration Projects, Implementation Schedules, and Potential Funding Sources for Lakes.

Shoreline (Project ID)	Implementation Schedule	Potential Funding Source	Planned Project Description	Restored Processes & Functions
Capitol Lake (1)	1-5 years	Washington State Department of General Administration	Enhancement of aquatic and riparian plantings along Deschutes Parkway.	Provides additional shoreline habitat for wildlife, and sources of large woody debris.
Capitol Lake (2)	2010-TBD	Washington State Department of General Administration	Efforts to eradicate the newly discovered New Zealand mud snail infestation.	Ensures continuation of existing habitat and native species.
Capitol Lake (3)	2013	City of Olympia—Storm and Surface Water Utility (Capital Facilities Plan)	Construction of a stormwater treatment facility for untreated runoff from Evergreen Park Drive, which discharges to Percival Cove and Capitol Lake.	This project will evaluate different treatment technologies for enhancing water quality.
Ken Lake (1)	2010-2013	City of Olympia—Storm and Surface Water Utility (Capital Facilities Plan)	Grading and landscaping of overland flow paths in three tributaries to Ken Lake.	Will reduce sediment erosion, and enhance the overall water quality of the lake.

Figure 5.3 Locations of Restoration Projects for Lakes



CHAPTER 6: RESTORATION PRIORITIES

When considering a priority scheme for restoration activities, the Department of Ecology Restoration Plan Guidelines noted the priorities should address where restoration would have a greater ecological benefit for the shoreline(s). Technical and scientific data, such as the *Budd Inlet Restoration and Conservation Planning* (2010) document by the Squaxin Island Tribe, and the ESA *Shoreline Analysis & Characterization Report* (2008) strongly influenced the priorities listed below; however, an evaluation of existing site conditions was not the only important factor. Also taken into consideration were other situational influences unique to the Olympia community, such as existing land uses, educational programs, the human experience, funding opportunities, strong local and regional partnerships and planning efforts, and availability of local resources and expertise.

As a key ecological process, the movement of sediment into, through, and out of shoreline ecosystems influences shoreline morphology, hydrologic and hydraulic characteristics, ability of surface and groundwater to interact, and the type and extent of aquatic habitat. In rivers, channel migration is a natural process, and is essential for the transfer of nutrients between the channel and floodplain, as well as an on-going source for streambed gravels.

Changes in land-use, including a reduction in tree canopy cover, development, and road construction or widening, have generally accelerated production of fine sediment, especially as runoff volumes and peak flows are increased. Increased flows increase in channel erosion and channel destabilization. Increases in fine sediment loading can adversely impact aquatic habitat by filling in the spaces of gravel beds and reducing the exchange of water and oxygen. Fine sediment also transports nutrients, metals, and other pollutants, and is closely linked to water quality. The construction of the dam that created Capitol Lake has also greatly impacted sediment transportation from the Deschutes River and Percival Creek. A significant portion of the sediments delivered by each is retained in Capitol Lake, rather than having emptied into the previously existing Deschutes Estuary.

As technical experts in marine and fresh water issues, such as sedimentation and its impacts, the City of Olympia Storm and Surface Water Utility has a history of providing extensive and comprehensive research and education in the South Sound. Their efforts to understand the existing condition of Budd Inlet, coupled with a work program with a long-standing focus on improving water quality, stormwater management, and community member choices as they impact the environment has momentum and will be important in successful implementation of priorities and projects . There are some priorities for which outreach and education will be necessary and other means may be limited, such as restoration in and around Chambers, Ward, and Ken Lakes, which are all surrounded almost exclusively by private landowners. Coupled with an existing well-developed public education program, outreach becomes a higher priority.

The priorities also recognize that humans have a desire to interact and connect with the natural environment in a way that is restorative, educational, and engaging, but also has little negative impact on that environment. Clean water lapping onto a beach or flowing through a ravine, scattered pieces of large, woody debris, and foot trails to overwater views are elements of a natural experience that can be readily implemented through restoration, and are also powerfully effective in fostering exploration, community education, and investment in environmental preservation and stewardship.

It is essential that priorities, while based on restoration needs readily identified for the South Sound, remain flexible enough to accommodate newly emerging funding and resource opportunities. Budd

Inlet, in particular will see the greatest gains in health and condition from large-scale, costly restoration projects that implement multiple priorities. To respond, priorities must be viewed as fluid enough within an implementation strategy that adapts to the discovery or development of future grants, willing lead partner organizations, or mitigation requirements. The City may also, in the future, wish to invest in or explore the feasibility of other new or currently unavailable means for achieving restoration and preservation, such as conservation easements or mitigation banking.

Olympia has an engaged non-profit and environmentally knowledgeable population. As the state Capital, many of the region's most respected environmental experts live and work locally. Priorities for the City capitalize on and foster partnerships with those members of the community and non-profit arena with access to federal resources, technical expertise, and passionate volunteers. The City also believes that regional and multi-jurisdictional efforts will lead to greater success, and are worth investment. Technical and scientific data and prioritization frameworks, like that developed by the Squaxin Island Tribe, and jurisdictional SMP's and Restoration Plans, can provide direction to multiple organizations seeking a shared framework towards which to allocate efforts. Olympia's extensive marine shoreline ensures a key role for the City in any South Puget Sound restoration planning, implementation, and monitoring.

While not directly influencing the priorities and restoration projects identified, responding to the anticipated effects of climate change will necessitate adaptability in future planning, and potentially a shifting of priorities as future revisions. As a community with a significant amount of marine shoreline, climate change will considerably influence the kinds of restoration implemented, when it is implemented, and how successfully. Known influences of a change in climate have not been confirmed for the South Sound, but potential effects include longer periods of drought, increases instances of flooding, changes and shifts in plant and wildlife populations, reduced snow accumulations and melt, and sea-level rise.

Taking into consideration the above noted data and influences, the following priorities and associated restoration projects have been identified as most beneficial in addressing the four restoration goals of the City of Olympia:

1) Improve water quality in Budd Inlet and its tributaries
2) Improve natural sediment processes
3) Preserve and restore wildlife habitat; and
4) Restore shorelines as opportunities for humans to connect with the natural environment.

6.1. Priority 1 - Improve Water Quality

Water quality is the end result of the interaction of water with biota, soils, and urban and rural land uses, and infrastructure. As water moves through an ecosystem, it has the opportunity to cycle mineral and organic constituents that can affect water quality. The longer water is able to contact soil and vegetation, the more cycling can occur. Longer water contact times typically occur in low gradient areas in the landscape, such as riverine and wetland systems, while filling, paving, and channelization reduce water contact times.

The water quality of lakes is highly dependent and sensitive to changes in nutrient loading, which can lead to algal blooms, changes in dissolved oxygen levels, etc. Water temperatures are higher in urban areas where riparian vegetation is lacking and urban runoff is a primary water source. Impervious surfaces and stormwater conveyance infrastructure, which can bypass natural hydrologic pathways that

include infiltration and percolation through soils, can negatively impact water quality by allowing for the build-up of metals, oils, grease, nutrients, and bacteria to be washed off and into water systems during storm events.

The initial results of studies recently conducted in Budd Inlet indicate that surface water runoff and stormwater may be the largest contributing factor in pollutant loading in the Sound, which is characterized by protected bays and narrow inlets, relatively shallow depths, stratification of the water column, slow flushing times, and a high shoreline to water surface-area ratio. The result is that when poor-quality water, such as water with excessive nutrients, enters the Sound from adjacent uplands, rivers, and streams, it is not easily diluted by mixing or flushing.

Ongoing or recommended restoration projects or programs that would address the improvement of water quality and natural sediment processes include:

<u>Existing Programs and Projects (Chapter 4)</u>

- 4.2—Critical Areas Regulations
- 4.3—Shoreline Master Program
- 4.4(B)—Water Washington Phase II Municipal Stormwater Permit
- 4.4(C)—2009 Drainage Design and Erosion Control Manual
- 4.4(D)—Public Education
- 4.4(G)— Restoration Projects and Invasive Species Removal
- 4.4(H)— Capital Improvement Projects
- 4.5— Septic to Sewer Conversion Program
- 4.6(B)—Integrated Pest Management and Chemical Free Parks
- 4.6(C)— Park Development and Renovation (West Bay Park and Percival Landing)
- 4.10(A)—Shipping Berth Pilot Interim Cleanup Action
- 4.10(B)— Cascade Pole
- 4.17(A)—Deschutes/Capitol Lake/Budd Inlet TMDL Process
- 4.17(B)—Department of Ecology: Toxics Cleanup Program

<u>Additional Programs and Projects (Chapter 5)</u>

- 5.2—Percival Creek (1)
- 5.2—Percival Creek (2)
- 5.3—Lakes (A)
- 5.3—Capitol Lake (3)
- 5.3—Ken Lake (1)
- 5.1—Budd Inlet (1-27)

6.2. Priority 2 - Improve Riparian Vegetation

Improved riparian vegetation can address multiple objectives, including providing important shoreline habitat for wildlife, improve water quality, and reduce sediment and pollutant delivery. Riparian vegetation is also the key source of large woody debris (LWD).

LWD significantly influences the form and ecological function of river and lake ecosystems. In a natural system, LWD by way of logs or trees that have fallen into a river, stream or lake, provides organic material to aquatic ecosystems and is considered a principal factor in forming stream structure and associated habitat characteristics (e.g., pools and riffles). Riparian vegetation and LWD provide habitat

in the form of nesting, perching, and roosting as well as thermal protection, nutrients, and sources of food (terrestrial insects) to a variety of fish and wildlife species.

Ongoing or recommended restoration projects or programs that would improve riparian vegetation include:

Existing Programs and Projects (Chapter 4)

- 4.2—Critical Areas Regulations
- 4.3—Shoreline Master Program
- 4.4(D)—Public Education
- 4.4(F)—Seasonal Vegetation Management Crew
- 4.4(G)—Restoration Projects and Invasive Species Removal
- 4.5(A)—Volunteers in Parks
- 4.5(C)—Park Development and Renovation (West Bay Park and Percival Landing)
- 4.9—Thurston Conservation District
- 4.12—South Puget Sound Salmon Enhancement Group
- 4.15—Capitol Land Trust
- 4.16—People for Puget Sound

Additional Programs and Projects

- 5.2—Black Lake Drainage Ditch (1)
- 5.2—Black Lake Drainage Ditch (2)
- 5.3—Lakes (A)
- 5.3—Lakes (C)
- 5.3—Capitol Lake (1)
- 5.1—Budd Inlet (3, 6, 7, 9, and 11)

6.3. Priority 3 - Restore and Improve Wildlife Habitat.

With the exception of the highly urbanized and altered habitats along the head of Budd Inlet, the majority of the marine nearshore environment either supports or has the potential to support valuable and ecologically sensitive resources. Key habitats and species that occur in Budd Inlet and can be targeted for restoration and/or improvement, include: sand and cobble beaches, forage fish spawning areas, mud-flats, shellfish resources, eelgrass and kelp beds, estuaries and intertidal wetlands and marshes, marine riparian vegetation, seabird and waterfowl concentration areas, and marine mammal habitats.

Specifically, Budd Inlet contains several critical saltwater habitat areas for forage fish and salmon. The steep slopes of Priest Point Park provide beach sediment for forage fish, Ellis Cove is relatively intact with a salmon-bearing stream, and some forage fish spawning habitat extends south from Priest Point Park for approximately 0.5 miles. Coho, Chum, and Chinook salmon, and Cutthroat trout have all been identified in Budd Inlet or its tributaries.

Intact nearshore habitat is essential for salmon, as it offers refuge, rest and feeding opportunities for juveniles before they embark on their ocean migrations. Shoreline modifications, such as armoring, prevent natural beach formation, which in turn limits habitat available for prey species favored by salmon.

Ongoing or recommended restoration projects or programs that would restore and improve fish and other wildlife habitat include:

Existing Programs and Projects (Chapter 4)

- 4.2—Critical Areas Regulations
- 4.3—Shoreline Master Program
- 4.4(G)—Restoration Projects and Invasive Species Removal
- 4.4(E)—Critical Habitat Land Acquisition and Management
- 4.5(C)—Park Development and Renovation (West Bay Park and Percival Landing)
- 4.7—LOTT Alliance
- 4.9—Thurston Conservation District
- 4.12—South Puget Sound Salmon Enhancement Group
- 4.13—Salmon Recovery Funding Board
- 4.15—Capitol Land Trust
- 4.16—People for Puget Sound
- 4.18—Puget Sound Nearshore Estuary Restoration Project

Additional Programs and Projects (Chapter 5)

- 5.2—Black Lake Drainage Ditch (1)
- 5.2—Black Lake Drainage Ditch (2)
- 5.3— Lakes (A)
- 5.3—Capitol Lake (1)
- 5.3—Capitol Lake (2)
- 5.1—Budd Inlet (1, 3, 4, 5, 6, 7, 8, and 9)

6.4 Priority 4 – Restore Natural Sediment Transportation Processes

As a key ecological process, the movement of sediment into, through, and out of shoreline ecosystems influences shoreline morphology, hydrologic and hydraulic characteristics, ability of surface and groundwater to interact, and the type and extent of aquatic habitat. In rivers, channel migration is a natural process, and is essential for the transfer of nutrients between the channel and floodplain, as well as an on-going source for streambed gravels.

Changes in land-use, including a reduction in tree canopy cover, development, and road construction or widening, have generally accelerated production of fine sediment, especially as runoff volumes and peak flows are increased. Increased flows increase in channel erosion and channel destabilization. Increases in fine sediment loading can adversely impact aquatic habitat by filling in the spaces of gravel beds and reducing the exchange of water and oxygen. Fine sediment also transports nutrients, metals, and other pollutants, and is closely linked to water quality. The construction of the dam that created Capitol Lake has also greatly impacted sediment transportation from the Deschutes River and Percival Creek. A significant portion of the sediments delivered by each is retained in Capitol Lake, rather than having emptied into the previously existing Deschutes Estuary.

Existing Programs and Projects (Chapter 4)

- 4.2—Critical Areas Regulations
- 4.3—Shoreline Master Program
- 4.4(B)—Water Washington Phase II Municipal Stormwater Permit
- 4.4(C)—2009 Drainage Design and Erosion Control Manual

- 4.4(D)—Public Education
- 4.4(G)— Restoration Projects and Invasive Species Removal
- 4.4(H)— Capital Improvement Projects
- 4.6(C)— Park Development and Renovation (West Bay Park and Percival Landing)
- 4.10(A)—Shipping Berth Pilot Interim Cleanup Action
- 4.17(A)—Deschutes/Capitol Lake/Budd Inlet TMDL Process

Additional Programs and Projects (Chapter 5)
- 5.2—Percival Creek (1)
- 5.2—Percival Creek (2)
- 5.3—Lakes (A)
- 5.3—Capitol Lake (3)
- 5.3—Ken Lake (1)
- 5.1—Budd Inlet (1-27)

6.5. Priority 5 - Reconnect Fish Passage to Budd Inlet, and Restore Mouths of Tributary Streams.
Expanding available fish habitat and spawning opportunities for fish is a high priority. Perhaps the most frequently encountered fish passage barriers are culverts that are improperly designed, installed, or maintained, and channel alterations that result in impassable conditions (Harry & Konovsky 1999).

Dams and diversions are also barriers to fish passage. The waters of Percival Creek flow into Capitol Lake, which is backed up behind a tide gate under 5th Avenue in downtown Olympia. Salmon can pass either through the constructed fish ladder or directly through the tide gate when open. Large numbers of Chinook salmon are typically observed downstream of the tide gate in August and early September. While they are milling below the tide gate, however, they are exposed to increased predation from seals and sea lions known to frequent the area (Harry & Konovsky 1999).

Fish can also be impacted at the Capitol Lake tide gate by impaired function of the fish ladder, or low lake levels, which are maintained within a narrow range in part to provide for additional flooding protection to downtown Olympia. At times, the lake elevation does not allow adult salmon to use the ladder, delaying their upstream migration when the tide gate is closed as well, which can result in increased predation by marine mammals (Harry & Konovsky 1999).
Ongoing or recommended restoration projects or programs that would restore and improve fish passage and mouths of tributary streams include:

Existing Programs and Projects (Chapter 4)
- 4.4(G)—Restoration Projects and Invasive Species Removal
- 4.7—LOTT Alliance
- 4.12—South Puget Sound Salmon Enhancement Group
- 4.13—Salmon Recovery Funding Board
- 4.18—Puget Sound Nearshore Estuary Restoration Project

Additional Programs and Projects (Chapter 5)
- 5.1—Budd Inlet (1, 2, 4, 5, and 12)

6.6. Priority 6 - Reduce Shoreline Armoring, and Restore or Improve Natural Shoreline Conditions and Processes

Physical processes that influence the physical structure of the nearshore include: wind energy and exposure, net shore-drift, coastal bluff landslides and erosion, and fluvial influences. Beaches in the Puget Sound often have two distinct components: a high-tide beach and a low-tide terrace. Waves and wind will deposit sand and gravel from the high-tide beach onto the low-tide terrace, which is generally a gently sloping accumulation of fine grained sediment. Larger rocks, ranging from cobbles to boulders, also accumulate on the low-tide terrace.

Wind-generated wave action gradually erodes beaches and the toe of coastal bluffs as well. Coastal bluffs are the primary source of sediment for Budd Inlet. Bluff composition and wave energy influence the composition of beach sediment. Waves sort coarse and fine sediment and large waves can transport cobbles that small waves cannot. Additionally beaches supplied by the erosion of coarse gravel bluffs will differ in composition from those fed by the erosion of sandy material.

The diversity of beach conditions and existence of feeder bluffs within the marine shoreline environment contribute to the availability of intact habitat for fish and other marine wildlife. Shoreline modifications and other artificial structures, such as boardwalks, bulkheads, and rip-rap, have eliminated the natural shoreline conditions that encourage sediment delivery and transportation. Maintaining existing connections between bluffs and the nearshore is a high priority.

Ongoing or recommended restoration projects or programs that would reduce shoreline armoring and restore or improve natural shoreline conditions and processes include:

<u>Existing Programs and Projects (Chapter 4)</u>

- 4.4(G)—Restoration Projects and Invasive Species Removal
- 4.12—South Puget Sound Salmon Enhancement Group
- 4.13—Salmon Recovery Funding Board
- 4.16—People for Puget Sound

<u>Additional Programs and Projects (Chapter 5)</u>

- 5.3—Lakes (C)
- 5.1—Budd Inlet (3, 6, 7, 9, and 11)

6.7. Priority 7 - Reduction of In-Water and Over-Water Structures

Efforts to remove overwater structures and armoring will contribute to restoring natural shoreline conditions and fish habitat. Docks and other overwater structures restrict light, which is needed by fish and other wildlife for development and awareness of their surroundings. Small fish can be preyed upon more easily when forced to venture into deeper water to avoid darkened shallow water near the shoreline.

The use of innovative structure materials, light penetrable grating, and the sharing of existing or future over-water structures by multiple property owners can contribute towards reducing the negative effects of structures. Older docks or other in-water structures in particular can negatively impact water quality through the depositing of toxics, and dampening of natural wave energy attenuation.

Ongoing or recommended restoration projects or programs that would reduce in-water and over-water structures include:

Existing Programs and Projects (Chapter 4)

- 4.5(C)—Park Development and Renovation (Percival Landing)
- 4.18—Puget Sound Nearshore Estuary Restoration Project

Additional Programs and Projects (Chapter 5)

- 5.3—Lakes (A)
- 5.1—Budd Inlet (13)

6.8. Priority 8 – Restore and Improve Tree Canopy Coverage in Drainage Basins and Along Shorelines

Trees help protect shorelines by protecting water and soil resources. Healthy trees can reduce the amount of runoff and pollutants in creeks, ponds and other receiving waters. The leaves, branch surfaces, and trunk bark intercept and store rainfall, thereby reducing runoff volumes and delaying the onset of peak flows. Tree root growth and decomposition increase the capacity and rate of soil infiltration by rainfall and reduce overland flow. Lastly, tree canopies reduce soil erosion by diminishing the impact of raindrops on barren surfaces (CUFR 2003). As noted in Priority 6, trees are also a valuable source of large woody debris (LWD), which provides organic material and habitat for shorelines.

Ongoing or recommended restoration projects or programs that would restore or improve tree canopy coverage in drainage basin and along shorelines include:

Existing Programs and Projects (Chapter 4)

- 4.2: Critical Areas Regulations
- 4.4(D)—Public Education
- 4.4(E)—Critical Habitat Land Acquisition and Management
- 4.4(F)—Seasonal Vegetation Management Crew
- 4.4(G)—Restoration Projects and Invasive Species Removal
- 4.4(J)—Low Impact Development Research and Planning
- 4.5(A)— Volunteers in Parks
- 4.5(C)—Park Development and Renovation (West Bay Park and Percival Landing)
- 4.9—Thurston Conservation District
- 4.12—South Puget Sound Salmon Enhancement Group
- 4.15—Capitol Land Trust
- 4.16—People for Puget Sound

Additional Programs and Projects (Chapter 5)

- 5.2—Black Lake Drainage Ditch (1)
- 5.2—Black Lake Drainage Ditch (2)
- 5.3—Lakes (A)
- 5.3—Lakes (B)
- 5.3—Capitol Lake (1)
- 5.1—Budd Inlet (3, 6, 7, 9, 10 and 12)

6.9. Priority 9 - Restore Estuarine Transition Habitat and Intertidal Influence

The primary ecological functions and biological resources of estuarine shorelines include: flood attenuation, tidal exchange/organic matter exchange, stream base-flow and groundwater support, water quality improvements, erosion and shoreline protection, and biological support and wildlife habitat. The benefits to the health and diversity of wildlife are extensive. Estuaries provide food web support, habitat structure, salinity gradients, and locations of refuge from predators. Kelp and eelgrass beds in intertidal areas are important habitat to forage fish and salmonids.

Estuaries and associate marshes are vital to the enhancement of water quality. The longer water is able to contact soil and vegetation, the more cycling can occur. Longer water contact times typically occur in low gradient areas in the landscape, such as estuaries and wetlands.
Alterations that limit or eliminate estuarine habitat and intertidal influence include structural modifications, such as dams and culverts, and armoring along shorelines, such as seawalls, rip-rap, and bulkheads.

Ongoing or recommended restoration projects or programs that would restore or improve estuarine habitat and intertidal influence include:

<u>Existing Programs and Projects (Chapter 4)</u>

- 4.2—Critical Areas Regulations
- 4.3—Shoreline Master Program
- 4.12—South Puget Sound Salmon Enhancement Group
- 4.13—Salmon Recovery Funding Board
- 4.15—Capitol Land Trust
- 4.16—People for Puget Sound
- 4.18—Puget Sound Nearshore Estuary Restoration Project

<u>Additional Programs and Projects (Chapter 5)</u>

- 5.1—Budd Inlet (1, 4, 5, and 27)

CHAPTER 7: REFERENCES CITED

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