TUKWILA SHORELINE MASTER PROGRAM

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Prepared by Tukwila Department of Community Development
with the assistance of ESA Adolfson and The Watershed Company

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2009 Shoreline Master Program

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1. INTRODUCTION

1.1 Purpose and Background

Commented [NG1]: This narrative has been updated to reflect the current SMP.

This document presents the Shoreline Master Program (SMP) for the City of Tukwila. It is an update to Tukwila's existing SMP, originally adopted in 1974. The SMP is intended to guide new shoreline development, redevelopment and promote reestablishment of natural shoreline functions, where possible. It was prepared in conformance with the Washington State Shoreline Management Act (Chapter 90.58 RCW) and its implementing regulations (WAC 173-26).

This Shoreline Master Program reflects changes in local conditions and priorities and the evolving State regulatory environment.
This Shoreline Master Program presents background information on the Shoreline Management Act, describes shoreline jurisdiction in Tukwila, summarizes the amendment process carried out to date, presents a summary of the Shoreline Inventory and Characterization, presents a summary of the Shoreline Restoration Plan, proposes shoreline environments, and establishes goals, policies and regulations, which apply to all activities on all affected lands and waters within the shoreline jurisdiction. In addition, there is a chapter that establishes design guidelines. Maps are provided to illustrate shoreline jurisdiction and environments. The Shoreline Inventory and Characterization Report is provided in Appendix A. The Restoration Plan is provided in Appendix B. A Cumulative Impacts Analysis is provided as a stand-alone document.

1.2 Shoreline Jurisdiction

A. Jurisdiction under the Shoreline Management Act

The Shoreline Management Act, or SMA, (RCW 90.58) establishes regulations for the management and protection of the state's shoreline resources and requires planning for reasonable and appropriate uses. The Act calls for a joint planning effort between state and local jurisdictions, requiring local government to develop its own Shoreline Master Program based on state guidelines.

The SMA requires that local governments establish shoreline jurisdiction for those bodies of water and lands that are considered to be "shorelines of the state" or "shorelines of statewide significance." Shorelines of the state include rivers with a mean annual flow of at least 20 cubic feet per second (cfs). Shorelines of statewide significance in western Washington include rivers with a mean annual flow of at least 1,000 cubic feet per second (cfs). The minimum shoreline environment required by the SMA includes all lands 200 feet from the "ordinary high water mark" or floodway of a state shoreline,

whichever is greater, and all wetlands associated with these state shorelines and located within the 100-year floodplain. The following graphic illustrates the jurisdiction of the Shoreline Management Act.

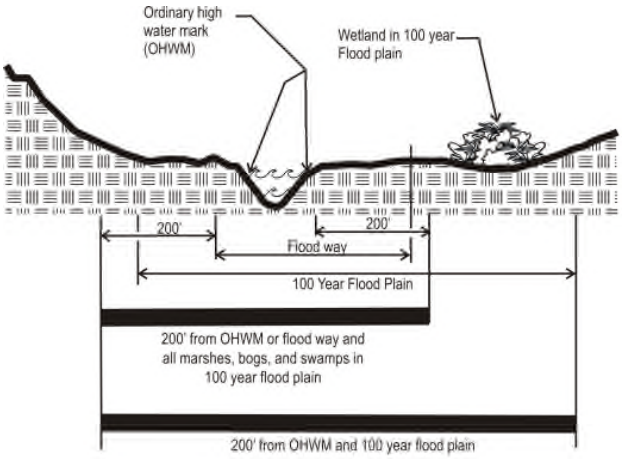


Figure 1.1 Lands and waters under the jurisdiction of the Shoreline Management Act

B. Shoreline Jurisdiction in Tukwila

The Green/Duwamish River is the only "shoreline of statewide significance" in the city (RCW 98.58.030). A small portion of the Black River, a shoreline of the state, is also located in Tukwila. Throughout the SMP document, the term "Shoreline Jurisdiction" is used to describe the water and land areas subject to shoreline jurisdiction in Tukwila. Based on SMA guidelines for shoreline jurisdiction, Tukwila's Shoreline Jurisdiction is defined as follows:

> *The Tukwila Shoreline Jurisdiction includes the channel of the Green/Duwamish River and the Black River, its banks, the upland area which extends from the ordinary high water mark landward for 200 feet on each side of the river, floodways and all associated wetlands within its floodplain. For the purpose of determining shoreline jurisdiction only, the floodway shall not include those lands that have historically been protected by flood control devices and, therefore, have not been subject to flooding with reasonable regularity.*

The Tukwila SMP applies to all development activity occurring within the Shoreline Jurisdiction, which corresponds to the Shoreline Overlay District as established by

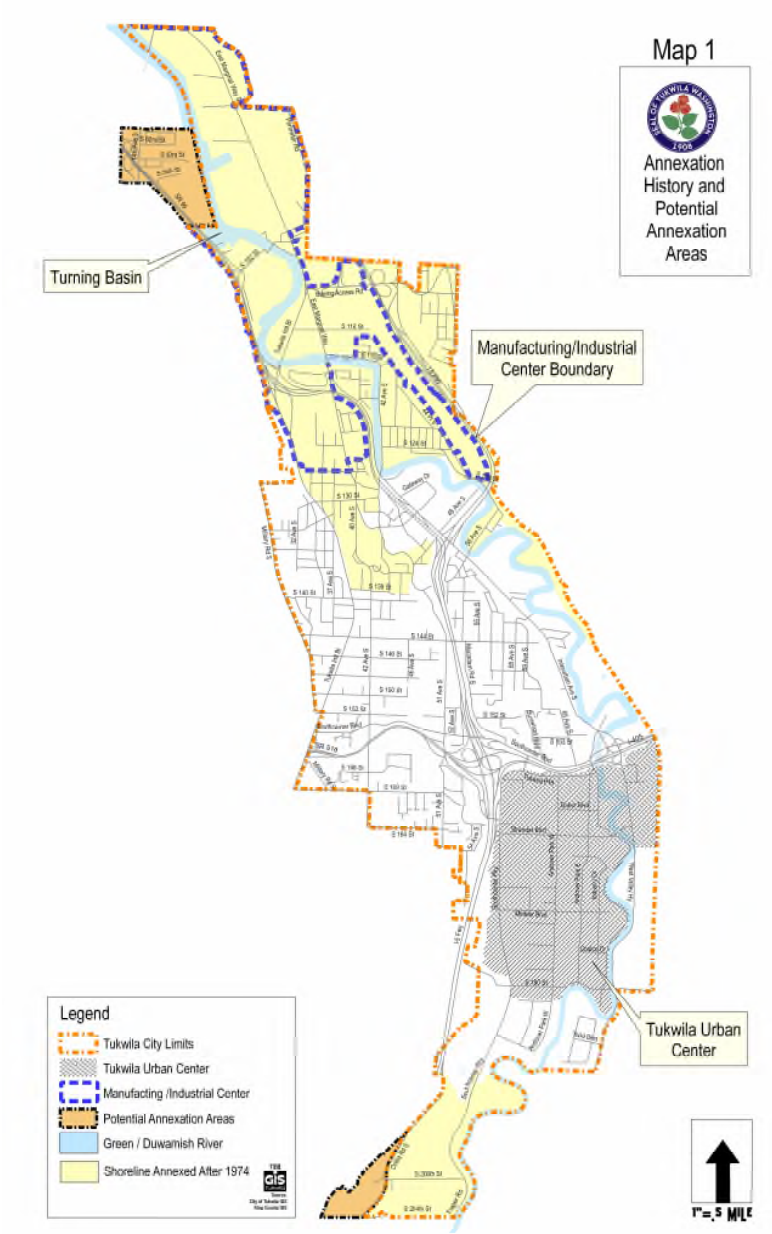
Chapter 18.44 of the Tukwila Municipal Code.

All proposed uses and activities under its jurisdiction must be reviewed for compliance with the goals, policies and regulations referenced herein. All proposed uses and development occurring within shoreline jurisdiction must conform to chapter 90.58 RCW, the Shoreline Management Act and this Master Program whether or not a permit is required.

This Master Program includes the two proposed annexation areas indicated in the Comprehensive Plan (Map 1). The north annexation area is located between the Green/Duwamish River on the east, Military Road to the west, and from S. 128th Street north to S. 96th Street. The south annexation area is located between I-5 and the Green River, south of the City limits to S. 204th Street. Adoption of shoreline policies and environment designations for newly annexed areas would require an amendment to the Shoreline Master Program. To avoid having to amend the SMP later, these potential annexation areas are considered here and the environmental designations and regulations will apply upon annexation.

In response to regional policies of the King County Growth Management Planning Council, Tukwila designated two key areas as its Urban Center and its Manufacturing Industrial Center (MIC). The Southcenter area, from I-405 south to S. 180th Street was designated the "Urban Center," and the Duwamish Corridor, an area where existing industrial-employment is concentrated, was designated as Tukwila's "Manufacturing Industrial Center." Both of these areas have lands adjacent to the Green River and are identified on **Map 1**.

The City Council adopted a Strategic Implementation Plan for the MIC on November 2, 1998. The Plan includes an analysis of existing conditions along the shoreline, narratives of various habitats, current regulations, proposed requirements and prototypes for future development along the shoreline in the MIC. The Strategic Plan was prepared in conjunction with a Planned Action Environmental Impact Statement that analyzed development alternatives in the MIC area and streamlined SEPA review for development in that corridor for the past 20 years. Where changed circumstances dictate, the SMP will provide updated guidance and regulations for the MIC area. The MIC area has significant potential for redevelopment.


Map 1
Annexation History and Potential Annexation Areas
Turning Basin
Manufacturing/Industrial Center Boundary
Tukwila Urban Center
Legend
Tukwila City Limits
Tukwila Urban Center
Manufacting /Industrial Center
Potential Annexation Areas
Green / Duwamish River
Shoreline Annexed After 1974

2. TUKWILA'S SHORELINE MASTER PROGRAM

2.1 SMP Components

Commented [NG2]: This reflects the elimination of duplicate language between this SMP and the Comprehensive Plan and Zoning Code. Removing the duplicate language will streamline this document and prevent inconsistencies.

To comply with the SMA, Tukwila has included the following components in this Shoreline Master Program (SMP):

- Outreach including a citizen participation process, coordination with state agencies, Indian tribes, and other local governments (see Section 2.4 below)
- Inventory, analysis and characterization of shoreline conditions, environmental functions and ecosystem-wide processes
- Analysis of potential shoreline restoration opportunities
- Establishment of shoreline environments
- Goals and policies that have been adopted in the Shoreline Element of the Comprehensive Plan
- Development regulations that have been codified in TMC 18.44 and 18.45
- Shoreline Design Guidelines that have been codified in TMC 18.44
- Evaluation and consideration of cumulative impacts

2.2 SMP Elements

The SMA includes eight main issues, or "elements," to be addressed in each local shoreline master program (RCW 90.58.100). To implement these elements, shoreline policies and regulations are to be developed for each. The policies are found in the Shoreline Element of the Comprehensive Plan and the regulations in Chapters 18.44 and 18.45 of the Zoning Code. The elements required by the SMA are:

Economic Development
Public Access
Recreation
Circulation
Shoreline Uses
Conservation
Historical, cultural, educational and scientific element
Preventing or minimizing flood damage

Consistent with the Growth Management Act requirement to integrate the SMP and the Comprehensive Plan, the City incorporated the required elements of a SMP noted above into its Plan. Further direction for implementation of the required elements of SMPs is provided through Zoning Code and Design Review requirements.

2.3 History of SMP Planning in Tukwila

Commented [NG3]: The background information has been condensed now that we have moved to the next update cycle.

Tukwila's Shoreline Master Program (SMP) was first adopted in 1974, in response to the

passage of the Shoreline Management Act (RCW 90.58). The SMP was later updated through minor amendments in 1982 and 1987, none of which required the adoption of a new SMP.

In 1992-93, as part of the preparation for a major revision to the City's Comprehensive Plan, the City completed a Shorelines Background Report (1993), with the participation of the Tukwila Tomorrow Citizen's Committee. This report established the basis for the shoreline comprehensive plan goals and policies adopted in 1995.

Staff began the process to prepare a new SMP in 1999, based on the draft shoreline guidelines that were in the process of adoption by the Department of Ecology at the time.

A grant from the Washington State Department of Ecology provided funding for a Shoreline Inventory of all parcels within the 200 foot Shoreline jurisdiction and a Shoreline Design Manual.

New shoreline regulations approved by Ecology in 2000 were immediately appealed and ultimately invalidated by the Shoreline Hearings Board in 2001. As a result, the City opted to defer completing its SMP update process until new guidelines were issued by Ecology, which occurred in 2003.

In 2005, Tukwila received a grant (SMA Grant No. 0600234) to complete a comprehensive update, including new technical analyses of shoreline conditions, restoration planning, and the preparation of revised SMP goals, policies, and regulations.

In order to capitalize on previous citizens' involvement in the planning process, the City decided to start the SMP update with the work begun in 1999, with revisions to address new Ecology regulations and guidance, as well as changed conditions in the City's shoreline area.

The development of any SMP, as required by new shoreline regulations, involves three specific steps

- Shoreline inventory and characterization, preparation of a restoration plan, preparation of a cumulative impacts analysis;
- Citizen involvement in development of policies and regulations; and
- Review by interested parties, including adjacent jurisdictions.

As part of this 2009 SMP update process, the City:

- Continued the previously started citizen involvement program utilizing the Planning Commission, which serves as the City's permanent citizen advisory body for land use issues, holding Open Houses and public hearings
- Coordinated and shared information with neighboring jurisdictions
- Updated and expanded the Shoreline Inventory and mapping (included as

Appendix A to this document)
- Prepared a Shoreline Restoration Plan (Appendix B)
- Proposed shoreline environment designations
- Proposed shoreline development policies
- Proposed shoreline development regulations
- Prepared a draft Cumulative Impacts Analysis
- Coordinated with Department of Ecology, submitting a staff draft SMP for review and comment and meeting with Ecology staff

2.4 Current SMP Update Process

The City of Tukwila completed a comprehensive update to its Shoreline Master Program in 2009, with additional revisions made in 2011. Washington state law requires jurisdictions to periodically review and update their SMPs every eight years in accordance with the SMA and its current guidelines and legislative rules to attain state approval. The City of Tukwila's update started with an open house the fall of 2018 and will be complete in 2019.

This periodic update is focused on:

- Reviewing relevant legislative updates since 2009 and incorporating any applicable amendments.
- Ensuring consistency with recently adopted regulations for critical areas and flood hazard areas.
- Streamlining and eliminating duplication in the documents.
- Addressing a limited number of policy questions such as a required levee profile, use of flood walls and incentives for public access.

This periodic update will not:

- Re-evaluate the ecological baseline which was established as part of the 2009 comprehensive update.
- Extensively assess no net loss criteria other than to ensure that proposed amendments do not result in degradation of the baseline condition.
- Change shoreline jurisdiction or environment designations.

3. DEFINITIONS

Definitions used in the administration of the Shoreline Master Program and are incorporated into the Definitions Chapter of the Zoning Code, TMC 18.06.

Commented [NG4]: This level of detail is no longer needed.

Commented [NG5]: Updates to the definition of substantial development and other changes to match current State regulations are found in the ordinance updating TMC 18.44.

4. SHORELINE INVENTORY AND CHARACTERIZATION - SUMMARY

Local jurisdictions updating their Shoreline Master Program (SMP) are required to prepare an inventory and characterization of the shoreline resources within their boundaries. As part of the City's prior SMP update, a Draft Inventory and Characterization Report and Map Folio was prepared in December 2006, and finalized in the spring of 2007 following technical review by Ecology and King County. The final report and map folio are included as Appendix A to this SMP. While the report has been finalized, the City continues to utilize the most recent information available, such as the recently updated FEMA Revised Preliminary Digital Flood Insurance Rate Maps (DFIRM), which were issued after the completion of the Inventory and Characterization report.

The purpose of the inventory and characterization report was to conduct a baseline inventory of conditions for water bodies regulated as "shorelines of the state" located in the City of Tukwila. The area regulated under Tukwila's SMP is approximately 12.5 linear miles along the banks of the Green/Duwamish River.

For the baseline inventory, the river shoreline was divided into four reaches: 1) Reach G1-PAA (southern Potential Annexation Area); 2) Reach G1 (from the southern City boundary downstream to the Black River/Green River confluence); 3) Reach G2 (from the Black River/Green River confluence downstream to the northern City limits); and 4) Reach G2-PAA (the northern Potential Annexation Area). The reaches are depicted on **Map 3.**

The shoreline characterization identifies existing conditions, identifies current uses and public access, evaluates functions and values of resources in the shoreline jurisdiction, and explores opportunities for conservation and restoration of ecological functions. The findings are intended to provide a framework for updates to the City's shoreline management goals, policies, and development regulations. Key findings of the inventory and characterization are summarized below.

4.1 Watershed Context and Shoreline Modifications

The City of Tukwila includes approximately 12.5 miles of the Green/Duwamish River and is situated in the Puget Sound Lowlands at the transition from the fresh water Green River to the tidally influenced Duwamish estuary ecosystem. The Green River basin is part of the Green/Duwamish Water Resource Inventory Area (WRIA 9).

Historically, the Green/Duwamish River drained a significantly larger area than it does today. The Green/Duwamish River has undergone extensive modifications in the past to reduce channel migration and limit the extent and duration of valley flooding. The modifications include both natural river course changes and major engineering projects in

the early part of the 20th century that diverted the White, Black and Cedar Rivers to neighboring basins. As a result, the overall freshwater discharge in the Green/Duwamish River has been reduced to around a third of the pre-diversion era.

Seven pump stations also modify flows into the Green and Duwamish Rivers. Three of the pump stations, Black River, P-17, and Segale, are operated by the Green River Flood Control District, and four stations, Lift Stations 15, 17, 18, and 19 are operated by the City of Tukwila. The Black River pump station is the largest station discharging flows to the Duwamish River. This station is approximately 1,000 feet upstream of the Green – Black River confluence, and is intended to both block floodwaters from the Green from inundating the Black River and Springbrook Creek in the City of Renton, and also regulates flows from Springbrook Creek into the Duwamish River. The P-17 pump station drains the P-17 Pond that collects surface water from a majority of the Urban Center. The Segale pump station was installed to regulate soil saturation and piping during high river events but does not add new flows to the river. The remaining City pump stations only operate when gravity discharge to the river is prevented by high river events.

Levees and/or revetments were constructed along much of the Green/Duwamish River through the City of Tukwila to increase bank strength and reduce flooding. In addition, flows within the Green/Duwamish River were greatly modified by the construction of the Howard A. Hansen Dam and installation of water diversions. These modifications significantly reduced the severity of floods that historically covered much of the valley bottom. The condition of the current system of levees and revetments is a growing source of concern for King County and the cities involved, as many of the levees are aging and do not meet current standards for either flood conveyance or stability. Aside from the Tukwila 205 certified levee on the left bank of the river in the Urban Center, other levees in the City do not meet COE standards and are mapped as floodplain. These include portions of the newly annexed Tukwila South area and levees along the right bank of the river. Current development proposals in Tukwila South include the relocation of the cross-valley levee and reconstruction of the non-certified levees to meet COE standards. The permitting for this work is on-going.

4.2 Biological Resources and Shoreline Functions

The Green/Duwamish River within the City of Tukwila provides important habitat for several fish and some wildlife species, such as osprey. The aquatic environment within the channel is an important corridor located at the transition from the freshwater riverine environment to tidal estuarine environment of Elliott Bay. Almost every species of anadromous fish migrates through this transition zone. The entire length of the Green/Duwamish River within the City of Tukwila has been declared “critical habitat” for Chinook salmon and bull trout. Both species are listed as threatened under the Federal Endangered Species Act.

One particularly important feature of Tukwila's shorelines is the habitat functions provided by the transition zone between fresh and salt water associated with the Duwamish estuary. In Tukwila, this area generally extends from the East Marginal Way bridge to the city's northern limits. The transition zone between fresh and salt water has effectively been pushed upstream from its historic location due to: (1) a significant reduction (70%) of fresh water flowing into the Duwamish estuary (owing to the diversion of the White and Cedar/Black Rivers), (2) channel dredging, and (3) reduction of flows as a result of the construction of the Howard A. Hanson Dam. The establishment of heavy industrial uses in the transition zone has replaced wetlands with impervious surfaces, and the stream banks have been replaced by levees and other armoring, eliminating edge habitat which slows flows and creating unrestrained rapid downstream flows. Spatial structure, residence time, and the habitat available for fish refugia and rearing functions in the Duwamish estuary have therefore been reduced and constrained. High densities of fish have been observed utilizing what is left of this specific habitat. At the watershed scale, overall increases in salmonid survival rates are dependent on the availability of sufficient transition zone habitat to accommodate fish while they adjust from fresh to salt water (WRIA 9 Steering Committee, 2005).

Modifications to the river system have resulted over time in reduced levels of ecosystem functioning, including hydrology, water quality, riparian habitat, and in-stream habitat. Changes to hydrology are the result of modified flow regime due to dam construction, diversion, and urban development. River management and levees have reduced the connection between the rivers and their floodplains, changing the spatial extent of habitats, and increasing the potential for negative water quality impacts. Disturbances to the channel banks have resulted in areas that are dominated by non-native invasive species. Wood, in the form of riparian trees and in-channel wood, is generally lacking throughout the system, which negatively impacts riparian and aquatic habitats.

4.3 Land Use

A. A History of the Green/Duwamish River and Tukwila's Shoreline: Origins of Land Development Patterns

The Green River drains 492 square miles extending from the western Cascade Mountains to Elliott Bay. The City of Tukwila lies at the lower ¼ of the overall watershed. As the Green River flows into the southern boundary of the City of Tukwila, it has drained approximately 440 square miles, or about 78 percent of its total drainage basin. Approximately 12.5 river miles of the Green/Duwamish River are included within the City of Tukwila, from about River Mile (RM) 16 to RM 3.7.

The Green/Duwamish River channel has been highly modified during the last 150 years. Modifications range from the installation of levees and revetments to straightening and dredging for navigation purposes. In general, the level of physical modification to the system increases with distance downstream, culminating at the artificial Harbor Island that

supports industrial activities at the Port of Seattle. Several turning basins are maintained by periodic dredging throughout the straightened reach. The highly modified portion of the Green/Duwamish has also been the location of significant discharge of pollutants, resulting in portions of the river being designated as Federal Superfund sites. Remediation, source control and disposal activities are ongoing throughout the area.

Prior to European settlement of the Lower Green River Valley, the floodplain likely consisted of a highly interspersed pattern of active and temporarily abandoned meandering channels, secondary channels, logjams, riparian forest, and scrub-shrub wetlands. The proportion of open channel to forest in the floodplain appears to have varied depending on the severity and timing of floods. High flows resulted in wider channels and the creation of new channels across the floodplain. Accounts of the channel systems indicate that major floods resulted in channel avulsion (abrupt change in the course of a river), rerouting around logjams, and the formation of new logjams. The area presently occupied by the City of Tukwila appeared historically to contain oxbow channels, secondary and backwater channels, and extensive floodplain wetlands.

As part of regional flood control and river management efforts, significant watershed-scale changes occurred to the major river drainages south of Elliott Bay, including changes to the alignments and discharge points of the Cedar, Black, Green and White Rivers. In general, these changes have reduced the amount of water flowing through the Green/Duwamish River to about one third of historic conditions.

Land use changes between European settlement and the current day have occurred in two general phases. From the mid 1800s to World War II, agriculture and timber harvesting dominated the Lower Green River Valley. Population densities in the Lower Green River Valley remained low until the Howard A. Hanson Dam project was completed in 1962, providing flood protection for the valley. Levees have also been constructed along the banks of the Green/Duwamish River, ranging from federally-certified levees to non-engineered agricultural berms. Since the dam and levee systems have significantly decreased the extent of flooding within the Lower Green River Valley, land development and urbanization have occurred. For more discussion on the character of the Green/Duwamish River and an inventory of river conditions, see the Shoreline Inventory and Characterization Report, prepared by ESA/Adolfson, May, 2007 found in Appendix A.

Historically, the Green/Duwamish River valley was known for its farmland. Farming was established in the early 1900's after forested areas were cleared and transportation to the area was improved. In 1906, construction of the Lake Washington ship canal eliminated flows of the Black River into the valley, reducing valley flooding. As a result, the river valley developed into highly productive farmland for the region.

In the early 1950's, the Port of Seattle proposed to convert much of the Green/Duwamish River valley to intensive industrial uses. These plans included converting the river into a shipping canal, possibly reaching as far south as the City of Auburn. Valley landowners countered this proposal by annexing large tracts of land into Tukwila to retain more control

over future land use decisions. With the construction of Howard Hanson Dam in 1962 on the upper Green River, flooding in the valley was further reduced. Much of the river is now contained within levees and surrounded by commercial and industrial development.

The Port's actions in the northern part of the River and drastic reduction in river flooding have had a major influence on the development of the river valley. Today, Tukwila's portion of the Green/Duwamish River is known as a center for retail, commercial and industrial uses. The river remains inaccessible to shipping activity south of the Turning Basin, where it can be accessed primarily by small water craft, kayaks and canoes only. Land uses along the river are mostly commercial and industrial activities, with a few residential areas. With the designation of the Southcenter area as an Urban Center and the Duwamish Corridor as a Manufacturing Industrial Center (MIC), this development pattern is expected to continue, and to intensify as redevelopment occurs.

B. Riverbank Vegetation

The natural environment along the river has been significantly altered from its original riparian corridor by intense urban development and river bank modification due to the construction of levees, revetments or other shoreline armoring. Most native stands of trees are gone, but have been replaced by new trees and plants in some areas. Landscaping with native and non-native plantings have also been completed in conjunction with new development along the corridor. Birds and small mammals are supported in both habitats. While more natural habitat is found up stream, re-development of the shoreline has the potential to provide appropriate landscaping and restoration of habitat that are more attractive to wildlife, people and a more environmentally sensitive form of development

C. Public Access

The regional Green River Trail provides public access to existing shoreline amenities and plans anticipate future linkages to Seattle's system. As redevelopment occurs, there will be opportunities to provide other types of public access, including viewing platforms, boat ramps and fishing areas.

4.4 Restoration Opportunities and Potential Use Conflicts

Past restoration work focused on the Green\Duwamish River (in Water Resource Inventory Area 9) has resulted in good data collection and identification of potential restoration opportunities. Significant restoration activities along the Green\Duwamish River are already underway in the form of the multi-agency Green River Ecosystem Restoration Project. Several opportunities have been identified on the river as part of the recently adopted King County Flood Hazard Management Plan. Restoration opportunities focus on several key elements:

- Removing non-native, invasive plant species and re-vegetating with native

riparian forest species;

- Removing artificial debris and walls that harden channel banks;
- Integrating the reconnection of floodplains, levee setbacks, and other ecosystem restoration techniques with future flood and river management efforts; and
- Property acquisition to allow for levee setbacks, side channel reconnection, and channel migration.

Two key issues illustrate constraints to implementing restoration and potential use conflicts in Tukwila: 1) levee maintenance and management; and 2) existing development patterns and anticipated redevelopment.

Discussion of shoreline planning for the Green River in Tukwila must acknowledge the fact that, in light of the existing system of levees (including the federally certified "205" levees) and revetments, the City cannot act alone. There are a variety of regulatory jurisdictions outside of the City with different responsibilities for maintenance and management of the levee system, including the U.S. Army Corps of Engineers (the Corps), the Federal Emergency Management Agency (FEMA), King County River and Floodplain Management Unit (acting as part of the Green River Flood Control Zone District), and private property owners. The City of Tukwila Public Works Department has overall responsibility for maintenance of all levees, including the federally certified levee, which extends from about the I-405 crossing to the south City limits. The actual maintenance work on this levee is contracted by the City to King County.

The restoration of native tree and shrub species along the levees would increase riparian habitat ecological functioning of this reach of the Green/Duwamish River, benefiting salmonids as well as other species. However, the Corps of Engineers (responsible for certifying the federal levee) believes that the root system of these trees could destabilize levees, resulting in water piping (e.g., water infiltrating into and through levees along root pathways at higher rates than it could through root free soil) at high flows, and potential levee failure if trees fall. For the Vegetation Free Zone of the levee, current Corps guidance only allows grass as vegetative cover on the levees (USACOE, Engineering Manual 1110-2-301). Current guidance also specifies a root-free zone where plantings can occur, but roots will generally not penetrate this structural zone. Therefore, under current regulations, to meet the requirements for federal levee certification, some vegetation was recently removed and ongoing vegetation management will be required to maintain the levee certification.

Under the SMA, removing trees and vegetation from the riparian zone of shoreline of the state is in conflict with policies for vegetation conservation and enhancement. A possible solution is to step back and re-slope the levees to create mid-slope benches where vegetation can be planted that will not interfere with the levee prism as the levee system is reconstructed to improve its stability. This would require additional easement area beyond the existing maintenance easements that have been acquired along the length of

the system.

The existing development pattern also represents constraints to implementing restoration projects, including levee setbacks, off-channel habitat restoration, wetland and stream restoration, and riparian zone enhancements. Most of Tukwila is fully developed, with portions having a dense, urbanized land use pattern. The City's first SMP, in place since 1974, established a 40-foot setback from the mean high water line. In places that have not been redeveloped under current regulations there is little more than this 40-foot zone that is not intensely developed. Some places have somewhat more open space and less development and thus have greater flexibility to accommodate potential habitat restoration actions. The City's vision for future land use, based on its comprehensive plan, includes maintenance and further development of its urban character, particularly its identity as a regionally significant center for manufacturing, industrial, and commercial development. A challenge lies ahead in determining how best to accommodate new and redevelopment near the shoreline in a manner consistent with both the Comprehensive Plan and the Shoreline Master Program in order to achieve "no net loss" of shoreline function.

4.5 Conclusions

Like many rivers in the Puget Sound region, the course and dynamics of the Green/Duwamish River has changed significantly as a result of development and alteration of its watershed over the past century or so. Characteristic of many cities in the region, Tukwila has grown and become highly urbanized. Continued growth is anticipated and the City is planning for that growth. To a significant degree, the City has envisioned and maintained a development pattern that preserved public access to the Green River and assured setbacks of new buildings from the shoreline. Issues of concern today are focused on reconstructing existing levees and revetments to protect existing development from flood hazards, an effort that will take place over a number of years in coordination with the King County Flood Control Zone District, King County and state and federal agencies. There are many opportunities for conservation and restoration actions in the City to restore or replace habitat while managing natural hazard areas.

Commented [NG6]: The current map is outdated, the transition zone was expanded to river mile 9 in the Duwamish Blueprint based on new understanding of the use of the upper reach by larger juveniles later in the year.

Revised Map 2 – Duwamish River Transition Zone

5. SHORELINE RESTORATION PLAN - SUMMARY

5.1 Background

The state guidelines require that local governments develop SMP policies that promote "restoration" of impaired shoreline ecological functions and a "real and meaningful" strategy to implement restoration objectives. The City's shoreline inventory and characterization report identifies which shoreline ecological functions and ecosystem processes have been impaired. Local governments are further encouraged to contribute to restoration by planning for and supporting restoration through the SMP and other regulatory and non-regulatory programs. As part of the SMP update process, the City developed a Draft Shoreline Restoration Plan in February 2007. The draft plan was finalized in May, 2008 following technical review by King County and Ecology and has since been updated to include additional potential projects, address Ecology comments and refocus priorities to projects within the Transition Zone. It is included as Appendix B to the SMP.

The restoration plan builds on the Inventory and Characterization Report and provides a framework to:

- Identify primary goals for ecological restoration of the Green/Duwamish ecosystem;
- Identify how restoration of ecological function can be accomplished;
- Suggest how the SMP update process may accomplish the restoration of impaired shoreline functions associated with the Green/Duwamish ecosystem; and
- Prioritize restoration projects so that the highest value restoration actions may be accomplished first.

5.2 Assessment of Shoreline Functions

As summarized in the previous section, the Inventory and Characterization analysis examined riverine and estuarine ecosystem processes that maintain shoreline ecological functions, and identified impaired ecological functions. The inventory report identified key ecosystem processes, and provided a qualitative assessment of their levels of functioning at both a watershed and city reach scale. Key ecosystem functions identified in the inventory, their level of alteration, and potential restoration actions are summarized in Table 1.

As noted in the Inventory and Characterization Report and summarized in the Shoreline Inventory and Characterization Summary Section, many of the alterations to shoreline functions and ecosystem processes in the Green/Duwamish River are due to watershed

scale issues within the upper watershed which cannot be fully restored or addressed in the lower river section through Tukwila. However, hydrologic, water quality, and habitat restoration measures in the City do have the potential to improve the overall functioning of this important section of the Green/Duwamish River ecosystem that includes the transition zone from fresh to salt water.

Table 1. General Restoration Potential within the Shorelines of Tukwila

Function Category	Function	Alterations to natural functioning	Potential Restoration Action within the City
Hydrologic	Channel -Floodplain Interaction	Presence of flood protection structures (e.g., levees, river bank revetments, flood gates) and significant fill and development along the shoreline limit channel-floodplain interactions in Tukwila.	1. Modify current levees and revetments to increase channel and floodplain interaction; 2. Excavate back or side channels;
Hydrologic	Upland sediment generation	Fine sediment contribution to the river is increased due to build-up and wash-off from surrounding urban land uses.	Implement enhanced stormwater BMPs for fine sediment removal in stormwater runoff.
Water Quality	Retention of particulates and contaminants	Levees and revetments are virtually continuous along the riverbanks, limiting the potential to retain particulates or contaminants contained in stormwater sheet flows in the fluvially dominated reaches. Particulates, including sediment, are retained in the tidally dominated reaches, as evidenced by the need to dredge the estuary turning basin.	1. Modify current levees and revetments to increase channel and floodplain area; 2. Install native riparian species to increase bank roughness.
Water Quality	Nutrient cycling	As channel-floodplain interaction was reduced, the channel became a conduit for nutrients, offering little opportunity for contact time with soils.	1. Increase riverine wetland area; 2. Install native riparian plant species. 3. Set back banks (revetments and levees).
Large Woody Debris (LWD) and Organics	Maintain characteristic plant community	The majority of the shoreline within the City of Tukwila is currently dominated by non-native invasive weed species (Himalayan blackberry, reed canary-grass, and Japanese knotweed). Some higher quality areas of cottonwood, alder, and willow exist in riparian areas bordering open space, parkland, and residential zones.	1. Remove invasive plants and install native riparian species; 2. Incorporate LWD into bank stabilization and restoration projects; 3. Institute programmatic weed control activities along shoreline. 4. Promote bioengineering techniques for shoreline stabilization projects.
LWD and Organics:	Source of LWD	Despite the lack of many sources for LWD, there are some large cottonwoods and big leaf maples occur along the levees and revetment system.	1. Install native riparian species; 2. Incorporate LWD into bank stabilization and restoration projects.

5.3 Plans, Programs, and Completed Projects

The importance of the Green/Duwamish ecosystem within the Puget Sound has resulted in significant focus on this area in terms of restoration potential. With the federal listing of Chinook and bull trout as endangered species, watershed planning in the region (e.g., WRIA 9) has focused on developing a Salmon Habitat Plan (WRIA 9, 2005), to which the City of Tukwila is a party. The plan establishes goals, objectives, and programmatic and site specific actions to address restoration of habitat critical to salmon species in the Green/Duwamish watershed.

Tukwila has already engaged in the greater regional restoration effort for the Green/Duwamish River. The City Council has ratified the WRIA 9 Plan and contributes resources to maintain operating staff. Tukwila has worked within the larger Green/Duwamish River Ecosystem restoration project to acquire or donate properties that are either currently functioning (Cecil B. Moses Park, Codiga Farm), or have the potential for restoration (North Winds Weir, Duwamish Gardens). WRIA 9 and other regional partners are currently working together to monitor baseline conditions. Several projects from the WRIA 9 Plan are included on the City's Capital Improvement Program list; other projects will be added as CIP projects are completed and funds are identified for new projects.

The restoration plan identifies several projects that have already been completed in the Green/Duwamish River. These projects provide an excellent opportunity to learn about what river restoration measures are the most effective. For example, it appears that the back channel that was excavated at Codiga Farm provides important habitat for migrating juvenile fish.

5.4 Restoration Opportunities

Based on the key ecosystem functions that are currently altered, there appear to be five specific types of restoration actions that will most benefit the Green/Duwamish ecosystem in Tukwila. These actions are intended to boost the levels of ecosystem functioning as part of a self-sustaining ecosystem that will limit the need for future manipulation. While these projects are intended to restore many ecosystem functions, the restoration activities will occur in the highly urban valley bottom, and as a result, cannot fully achieve pre-disturbance channel conditions. In addition, some restoration actions must occur at the watershed scale, which will restore ecosystem functions that cannot be addressed solely within Tukwila or as part of the SMP.

- **Enlarging channel cross-sectional area.** This action could include setting back levees and re-sloping banks to reduce steepness. These actions will increase flood storage, allow for more stable levees, restore some floodplain area, provide a larger intertidal zone in this important transitional area, and provide a more natural transition from aquatic to upland habitats. The Transition Zone is identified in **Map 2**.

- **Enhancing existing habitats.** These actions could include the removal of non-native invasive vegetation, installation of native riparian vegetation, and installation of LWD below Ordinary High Water. This action will improve the functioning of the aquatic, riverine wetland, and riparian habitats that currently exist along the Green/Duwamish River.

- **Creating off-channel habitat areas**. This action would create off channel areas through the excavation of historic fill or floodplain materials to create back channels as fish foraging and refugia areas.
- **Reconnecting wetland habitat to the river.** This action would reconnect an old oxbow wetland to the river, allowing for off-channel habitat (Nelson Side Channel).
- **Removing fish barriers where tributary streams discharge to the river.** This action would remove flap gates and install fish-friendly flap gates at the mouths of Tukwila's three major streams (Gilliam, Southgate and Riverton) and possibly restore habitat area at these locations in the shoreline jurisdiction.

5.5 Potential Projects and Priorities

The restoration plan summarizes 26 potential projects as specific restoration projects within the shorelines of Tukwila. Most of the restoration projects are part of ongoing restoration planning through the WRIA 9 watershed planning process. Additionally, opportunities exist to enhance riparian vegetation along the majority of the Green/Duwamish River.

The restoration plan provides a preliminary qualitative (high, medium, low) project ranking system. Within this ranking system, the highest priority location for restoration projects is within the transition zone. The Transition Zone is mapped in **Map 2**.

High priority projects will typically:

- Address both hydrologic and habitat ecosystem functions;
- Have opportunity for multiple funding sources;
- Include freshwater tributary channels; and/or
- Not require additional property acquisition.

Medium priority projects will typically:

- Address limited ecosystem functions; and
- Be eligible for multiple funding sources, and/or require property acquisition.

Low priority projects will typically:

- Only focus on habitat enhancement;
- Will be used as mitigation to offset impacts elsewhere; or
- Not be eligible for multiple funding sources.

6. SHORELINE GOALS AND POLICIES

Commented [NG7]: The proposal is to delete the duplicate listing of goals and policies from the Shoreline Element. Minor edits to the Element are needed to match the 2011 revisions approved by DOE and will be found in a separate ordinance.

The goals and policies that lead and inspire Tukwila's shoreline actions are found in the Shoreline Element of the City's 2015 Comprehensive Plan. These, along with the narrative in that Chapter, were updated based on the 2009 SMP and 2011 revisions approved by the Department of Ecology.

7. SHORELINE ENVIRONMENT DESIGNATIONS

The City of Tukwila's Shoreline Master Program (SMP) establishes a system to classify shoreline areas into specific "environment designations." This system of classifying shorelines is established by the Shoreline Management Act (RCW 90.58) and Master Program Guidelines (WAC 173-26-211). The purpose of shoreline environment designations is to provide a uniform basis for applying policies and use regulations within similar shoreline areas. Generally, shoreline designations should be based on existing and planned development patterns, biological and physical capabilities and limitations of the shoreline, and a community's vision or objectives for its future development.

7.1 Pre 2009 Regulatory Framework

Tukwila's first SMP adopted in 1974, designated all shorelines as "Urban." At the time the 1974 SMP was developed, all of the land in Tukwila's shoreline jurisdiction was either zoned commercial/industrial or was developed with urban uses. The SMP defined the Urban Environment as "areas to be managed in high intensive land uses, including residential, commercial, and industrial development and accessory uses, while providing for restoration and preservation to ensure long-term protection of natural and cultural resources within the shoreline" (Tukwila, 1974). The SMP further stated that the management objectives for the shoreline "are directed at minimizing adverse impacts on the river and shoreline ecology, maximizing the aesthetic quality and recreational opportunities of the river shore, and recognizing the rights and privileges of property owners" (Tukwila, 1974). Within the Urban Environment, Tukwila's SMP employed a tiered system of regulations based on the distance from the Green/Duwamish River mean high water mark (MHWM). These tiered management zones are generally described below and illustrated on Figure 1:

- River Environment/Zone: a 40-foot wide zone extending landward from MHWM and having the most environmentally protective regulations;
- Low-Impact Environment/Zone: the area between the River Environment and 100 feet from the MHWM; and
- High-Impact Environment/Zone: the area between 100 and 200 feet from the MHWM.

The City also administered the King County Shoreline Master Program for the areas

which had been annexed since the adoption of the City's SMP in 1974. These areas were designated Urban and the setbacks from Ordinary High Water Mark varied from 20 feet to 50 feet depending on whether the use was water dependent, single family or commercial/industrial. See **Annexation History, Map 1** for an identification of the areas where the City administered the County's SMP.

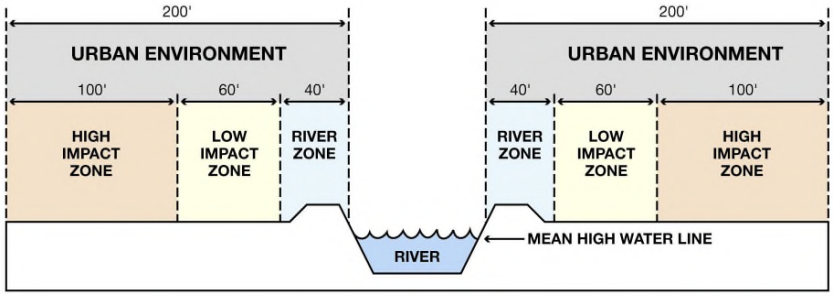


Figure 1. Pre 2009 Tukwila SMP Shoreline Management Zones (1974 SMP; TMC 18.44)

7.2 Key Findings of the Shoreline Inventory / Characterization Report and Restoration Plan

This section summarizes findings from the Inventory and Characterization Report and Restoration Plan elements of the SMP update (Appendices A and B). These findings inform the goals, policies, regulations, and the development and application of environment designations. In this context, the key findings can be summarized as follows:

- The Green/Duwamish River throughout Tukwila is a critical resource, particularly in the Transition Zone portion of the river that extends from river mile 10 upstream from the Interstate 5 bridge through the north City limits (see **Map 2**), where juvenile salmon adjust from fresh to salt water habitat. The river provides migratory habitat for numerous fish species, as well as riparian habitat for a variety of wildlife.
- The river is a critical resource for Muckleshoot Indian Tribe fishing.
- The river is a critical resource for some water dependent uses north of the Turning Basin.
- The river is an important recreational resource for sport fishing, small water craft and Green River Trail users.
- At an ecosystem scale, the habitat is largely homogenous throughout the city. In addition, many ecosystem processes are largely controlled by up-river characteristics, particularly the Howard Hanson Dam and are little affected by

actions in the City, except for such functions as water quality (especially fine sediment capture and filtering of contaminants in stormwater), local surface hydrology (stormwater from increasing amounts of impervious surfaces and contribution to peak flows of the river), riparian habitat, and temperature control (shading from riparian habitat).With the exception of the functions provided by the transitional mixing zone from salt to fresh water, habitat conditions and functions are relatively similar throughout the shoreline. The transition zone needs greater protection and restoration focus than other sections of the shoreline in the city.

- Restoration opportunities are numerous and spatially distributed throughout Tukwila's shoreline. Activities that provide restoration of both floodplain functions and habitat functions should be prioritized, particularly those projects in the transition zone. Policies should promote and regulations should enable the City to accomplish restoration goals and actions.

7.3 State Environment Designation System

State Master Program Guidelines (WAC 173-26-211) establish the environment designation system for shorelines regulated by the Shoreline Management Act. The guidelines (WAC 173-26-150 and 176-26-160) give local jurisdictions the option to plan for shorelines in designated Urban Growth Areas (UGA) and Potential Annexation Areas (PAA) as well. The City can "pre-designate" shoreline environments in its designated PAA as part of this planning process. However, shorelines in the PAA would continue to be regulated under the provisions of the King County SMP until the City annexes those areas. The County's SMP designates the City's North PAA and the South PAA as High Intensity.

The guidelines (WAC 173-26-211(4)(b)) recommend six basic environment designations: high intensity; shoreline residential; urban conservancy; rural conservancy; natural; and aquatic. Local governments may establish a different designation system, retain their current environment designations and/or establish parallel environments provided the designations are consistent with the purposes and policies of the guidelines (WAC 173-26-211(4)(c)). The guidelines also note that local shoreline environment designations should be consistent with the local comprehensive plan (WAC 173-26-211(3)).

For each environment designation, jurisdictions must provide a purpose statement, classification criteria, management policies and environment specific regulations. Table 2 describes the purpose for each of the recommended designations in the state guidelines. For each designation, the potential applicability to Tukwila is noted.

Table 2. State Recommended Environment Designation System - WAC 173-26-211 (5)

Environment Designation	Purpose	Applicability to Tukwila
Aquatic	The purpose of the "aquatic" environment is to protect, restore, and manage the unique characteristics and resources of the areas waterward of the ordinary high-water mark.	This designation will be used for the area waterward of the ordinary high water mark which includes the water surface along with the underlying lands and the water column.
Natural	The purpose of the "natural" environment is to protect those shoreline areas that are relatively free of human influence or that include intact or minimally degraded shoreline functions intolerant of human use.	While the Green River shorelines in Tukwila provide some important ecological functions, the river and adjacent uplands throughout Tukwila have been significantly altered by dense urban development and are generally armored or otherwise modified.
Rural Conservancy	The purpose of the "rural conservancy" environment is to protect ecological functions, conserve existing natural resources and valuable historic and cultural areas in order to provide for sustained resource use, achieve natural floodplain processes, and provide recreational opportunities.	Not applicable to Tukwila. All of the City's shorelines are urbanized. Potential annexation areas are either urbanized or proposed for intensive development.
Urban Conservancy	The purpose of the "urban conservancy" environment is to protect and restore ecological functions of open space, floodplain and other sensitive lands where they exist in urban and developed settings, while allowing a variety of compatible uses.	This designation is applicable in that the Green River is an important natural resource. The most significant shoreline function provided in Tukwila is related to fish and wildlife habitat. Open space is limited by the existing development pattern and floodplains are largely disconnected by a series of levees, revetments, and other infrastructure.
Shoreline Residential	The purpose of the "shoreline residential" environment is to accommodate residential development and appurtenant structures that are consistent with this chapter. An additional purpose is to provide appropriate public access and recreational uses.	This designation is most applicable for those portions of Tukwila's shorelines where the existing and planned development pattern is for low density (i.e., predominantly single-family) residential uses or public recreation uses.
High-Intensity	The purpose of the "high-intensity" environment is to provide for high-intensity water-oriented commercial, transportation, and industrial uses while protecting existing ecological functions and restoring ecological functions in areas that have been previously degraded.	This designation is applicable along only part of Tukwila's shorelines, in the Manufacturing and Industrial Center (MIC) north of the Turning Basin. Water-dependent uses are currently limited, as only a small portion of the river in Tukwila is navigable for commercial purposes, and much of the river has levees, thus restricting use immediately adjacent to the river.

7.4 Environment Designations

The Natural and Rural Conservancy Environments are not well suited to a highly developed, urbanized river that is navigable for only a small portion of the system and is

significantly constrained by levees for flood management, such as the Green/Duwamish River in Tukwila. The City's **Shoreline Environments**, which are identified on **Map 3,** are:

- Shoreline Residential Environment
- Urban Conservancy Environment
- High Intensity Environment, and
- Aquatic Environment

The City designated a buffer to replace the prior system of parallel shoreline management zones. Instead of the prior River Environment, a minimum buffer was established for each shoreline environment and allowed uses were designated for the buffer area along the river and the remaining shoreline jurisdiction. This system is intended to facilitate the City's long-range objectives for land and shoreline management, including:

- Ensuring no net loss of ecological shoreline functions;
- Providing for habitat protection, enhancement, and restoration to improve degraded shoreline ecological functions over time and protection of already restored areas;
- Allowing continued and increased urban development in recognition of Tukwila's role as a regionally significant industrial and commercial center; and
- Providing for improved flood control in coordination with King County and the Army Corps of Engineers.

Table 3, on the following page, provides a summary of the characteristics of the river shoreline in Tukwila to set the stage for the discussion in Section 7.5 on the determination of shoreline buffers.

Table 3. Summary of Buffer Widths for Land Use Zones and Shoreline Ecological Conditions

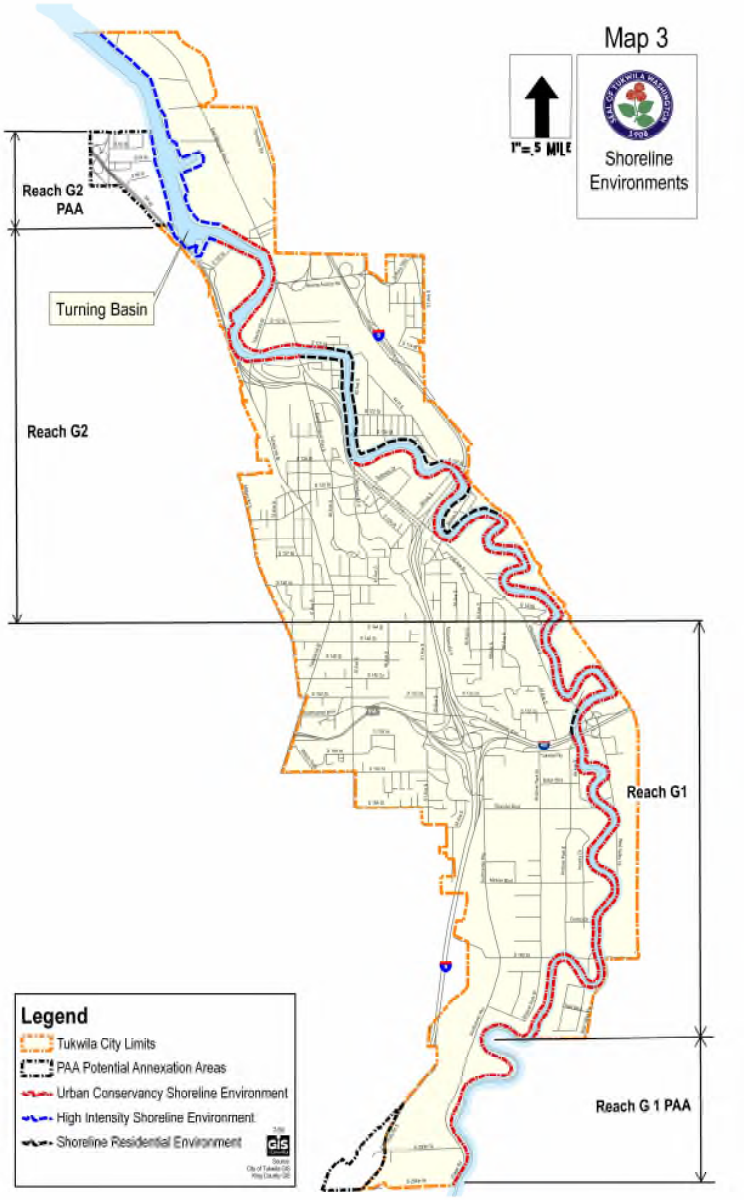
Area	Characteristics	Environment	Buffer	Modification
MIC/H & MIC/L Zoned property from North City Limits to EMWS Bridge, and North Potential Annexation Area	Fresh/Salt water Transition Zone, Lower flooding risk, Less than 20' difference from OHWM to top of bank, tidal influence	High Intensity	100'	The Director may reduce the standard buffer on a case-by-case basis by up to 50% upon construction of the following cross section: - 1. reslope bank from OHWM (not toe) to be no steeper than 3:1, using bioengineering techniques - 2. Minimum 20' buffer landward from top of bank - 3. Bank and remaining buffer to be planted with native species with high habitat value Comment: Maximum slope is reduced due to measurement from OHWM and to recognize location in the Transition Zone where pronounced tidal influence makes work below OHWM difficult. Any buffer reduction proposal must demonstrate to the satisfaction of the Director that it will not result in direct, indirect or long-term adverse impacts to the river. In all cases a buffer enhancement plan must also be approved and implemented as a condition of the reduction. The plan must include using a variety of native vegetation that improves the functional attributes of the buffer and provides additional protection for the shoreline ecological functions.
LDR Zoned property w/o levees from EMWS to I-405	Moderate flooding risk, Less than 25' difference from OHWM to top of bank, tidal influence on northern section	Shoreline Residential	Distance required to set back slope from toe at 2.5:1 plus 20' setback, Min. 50' width	Removal of invasive species and replanting with native species of high habitat value voluntary unless triggered by requirement for a Shoreline Substantial Development permit

LDR Zoned property with levees from EMWS to I-405	Moderate flooding risk, Less than 25' difference from OHWM to top of bank, tidal influence on northern section	Shoreline Residential	125'	Upon reconstruction of levee in accordance with City levee standards, the Director may reduce the buffer to actual width required. Comment: this applies to City-owned property at Fort Dent.
Commercially zoned property from 42nd Ave S. Bridge to I-405	Moderate flooding risk, Less than 25' difference from OHWM to top of bank	Urban Conservancy	100'	The Director may reduce the standard buffer on a case-by-case basis by up to 50% upon-construction of the following cross section: • reslope bank from toe to be no steeper than 3:1 using bioengineering techniques • Minimum 20' buffer landward from top of bank • Bank and remaining buffer to be planted with native species with high habitat value Any buffer reduction proposal must demonstrate to the satisfaction of the Director that it will not result in direct, indirect or long-term adverse impacts to shoreline ecological functions. In all cases a buffer enhancement plan must also be approved and implemented as a condition of the reduction. The plan must include using a variety of native vegetation that improves the functional attributes of the buffer and provides additional protection for the shoreline ecological functions.
West River bank from I-405 to South City Limit, Tukwila 205 Levee and South Annexation Area	High flooding risk, Federally certified and County levee, large water level fluctuations	Urban Conservancy	125'	Upon construction or reconstruction of levee in accordance with City levee standards the Director may reduce the buffer to the actual width required. In no case shall the buffer be less than 50 feet.

Commented [NG8]: The proposal is to change this to 3:1 to provide greater slope stability and ease of planting. This can be accommodated within the existing 100' buffer width.

East River bank **without levee** from I-405 south to City Limits	Moderate flooding risk, 20 to 25' difference from OHWM to top of bank, Moderate slumping risk, large water level fluctuations	Urban Conservancy	100'	The Director may reduce the standard buffer on a case-by-case basis by up to 50% upon construction of the following cross section: - 1. reslope bank from toe to be no steeper than 3:1, using bioengineering techniques - 2. Minimum 20' buffer landward from top of bank - 3. Bank and remaining buffer to be planted with native species with high habitat value Any buffer reduction proposal must demonstrate to the satisfaction of the Director that it will not result in direct, indirect or long-term adverse impacts to shoreline ecological functions. In all cases a buffer enhancement plan must also be approved and implemented as a condition of the reduction. The plan must include using a variety of native vegetation that improves the functional attributes of the buffer and provides additional protection for the shoreline ecological functions.
East River bank **with levee** from I-405 to South City Limit	Moderate flooding risk, 20 to 25' difference from OHWM to top of bank, Moderate slumping risk, large water level fluctuations	Urban Conservancy	125'	Upon reconstruction of levee in accordance with City levee standards the Director may reduce the buffer to the actual width required for the levee. In no case shall the buffer be less than 50 feet.
Any shoreline environment where street or road runs parallel to the river through the buffer				End buffer on river side of existing improved street or roadway.

Commented [NG9]: The proposal is to change this to 3:1 to provide greater slope stability and ease of planting. This can be accommodated within the existing 100' buffer width.


Map 3
1"=.5 MILE
Shoreline Environments
Reach G2 PAA
Turning Basin
Reach G2
Reach G1
Reach G 1 PAA
Legend
Tukwila City Limits
PAA Potential Annexation Areas
Urban Conservancy Shoreline Environment
High Intensity Shoreline Environment
Shoreline Residential Environment

7.5 Determination of Shoreline Buffers

The determination of the buffer distances for each shoreline environment was based on several factors including the analysis of buffer functions needed for protecting and restoring shoreline ecological function (as presented in the Shoreline Inventory and Characterization Report) and the need to allow space for bank stability and for protecting human life and structures from damage from high flows, erosion and bank failures. Safety of residents and people who work in buildings along the shoreline has become even more important in recent years due to the increase in stormwater entering the river from increasing impervious surfaces throughout the watershed and increasing frequency and intensity of flows during high rain events. These higher and more frequent flows will put more stress on over-steepened banks all along the river, increasing the possibility of bank erosion, levee failures, and bank failures. Thus, ensuring that new structures are not built too close to the river's edge is crucial to avoid loss of human life.

Staff also reviewed the rationale for the buffer widths established for watercourses under TMC 18.45, the Sensitive Areas Ordinance, as well as buffer widths recommended by resource agencies, such as the State Department of Fish and Wildlife, Department of Natural Resources and the recent Biological Opinion issued by National Marine Fisheries Service in relation to FEMA's National Flood Insurance Program.

The final buffer widths proposed by staff for each shoreline environment attempted to balance shoreline ecological function needs, human life and property protection needs (including future levee repair/reconstruction), existing land use patterns, and state and federal agency policies.

The following information summarizes the analysis carried out and the rationale used for determining buffer widths.

A. Buffer Functions Supporting Shoreline Ecological Resources, Especially Salmonids

Buffers play an important role in the health of any watercourse and an even more important role when considering the health of salmonids in the Green/Duwamish River system. The key buffer functions for the river are summarized below.

The Shoreline Management Act and the Department of Ecology regulations require evaluation of ecological functions and that local SMPs ensure that the policies and regulations do not cause any net loss of shoreline ecological function. In addition, the SMP must identify mechanisms for restoration of lost ecological functions.

The crucial issue for the Green/Duwamish River is the presence of salmonids that are on the Endangered Species list. To protect and restore ecological functions related to these

species it is important to provide for the installation of native vegetation along the shoreline. Such vegetation provides shade for improving temperature conditions in the river and habitat for insects on which fish prey. Trees along the shoreline also provide a source of large woody debris (tree trunks, root wads, limbs, etc. that fall into the water), which in turn provides pooling and areas of shelter for fish and other animals. In order to allow for planting of native vegetation, banks need to be set back to allow for less steep and more stable (requiring less armoring) slopes, so that they can be planted which is crucial for improving shoreline ecological functions that are needed in the river.

Commented [NG10]: While the current profile requires a mid-slope bench for plantings they can also occur outside of the levee prism when designed using flood walls or shallower slopes.

The buffer widths needed to achieve a particular buffer function vary widely by function type from as little as 16 feet for large woody debris recruitment (assuming the buffer has large trees) to over 400 feet for sediment removal. The Washington State Department of Fish and Wildlife (WDFW) recommends a riparian buffer width of 250 feet for shorelines of statewide significance (this applies to the Green/Duwamish River). The Washington Department of Natural Resources (WDNR) recommends a riparian buffer of 200 feet for Class 1 Waters (the Green/Duwamish River is a Class 1 Water under the WDNR classification scheme). The National Marine Fisheries Service (responsible at the federal level for overseeing protection of endangered salmonids under the Endangered Species Act) has recommended a buffer of 250 feet in mapped floodplain areas to allow for protection of shoreline functions that support salmonids.[1] Tukwila's Sensitive Areas Ordinance (TMC 18.45) has established a 100 foot buffer for Type 2 watercourses in the city (those that bear salmonid species).

The key buffer functions for the river are summarized below.

1. Maintenance of Water Quality
   Salmonid fish require water that is both colder and has lower nutrient levels than many other types of fish. Vegetated shoreline buffers contribute to improving water quality as described below.

   a. Water Temperature: The general range of temperatures required to support healthy salmonid populations is generally between 39 degrees and 63 degrees. Riparian vegetation, particularly forested areas can affect water temperature by providing shade to reduce exposure to the sun and regulate high ambient air temperatures.
   b. Dissolved Oxygen: dissolved oxygen is one of the most influential water quality parameters for aquatic life, including salmonid fish. The most significant factor affecting dissolved oxygen levels is water

[1] Endangered Species Act – Section 7 Consultation, Final Biological Opinion and Magnuson –Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation, Implementation of the Flood Insurance Program in the State of Washington, Phase One Document, Puget Sound Region, September, 2008.

temperature – cooler streams maintain higher levels of oxygen than warmer waters.

c. Metals and pollutants*:* Common pollutants found in streams, particularly in urban areas, are excessive nutrients (such as phosphorous and nitrogen), pesticides, bacteria and miscellaneous contaminants such as PCBs and heavy metals. Impervious surfaces collect and concentrate pollutants from different sources and deliver these materials to streams during storm events. The concentration of pollutants increases in direct proportion to the total amount of impervious area. Undisturbed or well vegetated riparian buffer areas can retain sediment, nutrients, pesticides, pathogens and other pollutants, protecting water quality in streams. Elevated nitrogen and phosphorus levels in runoff are a typical problem in urban watersheds and can lead to increased in-stream plant growth, which results in excess decaying plant material that consumes oxygen in streams and reduces aquatic habitat quality.

2. Contributing to in-stream structural diversity

    a. Large woody debris (LWD) refers to limbs and tree trunks that naturally fall into the stream bed from a vegetated buffer. LWD serves many functions in watercourses. LWD adds roughness to stream channels, which in turn slows water velocities and traps sediments. Sources of LWD in urban settings are limited where stream corridors have been cleared of vegetation and developed and channel movement limited due to revetments and levees. Under natural conditions, the normal movement of the stream channel, undercutting of banks, wind throw, and flood events are all methods of LWD recruitment to a stream channel.
    b. LWD also contributes to the formation of pools in river channels that provide important habitat for salmonids. Adult salmonids require pools with sufficient depth and cover to protect them from predators during spawning migration. Adult salmon often hold to pools during daylight, moving upstream from pool to pool at night.

3. Providing Biotic Input of Insects and Organic Matter

    a. Vegetated buffers provide foods for salmonids and other fish, because insects fall into the water from overhanging vegetation.
    b. Leaves and other organic matter falling into stream provide food and nutrients for many species of aquatic insects which in turn provide forage for fish.

B. Bank Stability and Protection of Human Lives and Structures

The main period of runoff and major flood events on the Green River is from November through February. The lower Green and Duwamish levees and revetments form a nearly continuous bank protection and flood containment system. Farmers originally constructed many of these levees and revetments as the protection to the agricultural lands of the area and this original material is still in place as the structural core. In particular, these protection facilities typically have over-steepened banks, areas with inadequate rock buttressing at the toe, and lack habitat-enhancing features such as overhanging vegetation or in-water large woody debris. Because of these design and construction shortcomings, the protection to river banks has not always performed as intended. Instead, there have been bank failures that have threatened structures and infrastructure; erosion of banks – making them even steeper; and damage to levees that has required a series of repair projects.

The damage to the levee system in storm events lead to discussions among the City, US Army Corps of Engineers and the King County Flood Control District to determine the best levee design to prevent the recurring problem of continued levee repairs. The criteria used to design a levee profile are:

- Public Safety;
- Maintaining levee certification;
- Solutions that eliminate or correct factors that have caused or contributed to the need for the levee repair;
- Levee maintenance needs; and
- Environmental considerations.

To overcome the existing problems and to reduce future maintenance and repair costs, the Corps chose to lessen the overall slope to a stable grade. This selected method is consistent with recommendations set forth in the Corps of Engineers' Manual for Design and Construction of Levees (EM 1110-2-1913) for slope stability. It also is consistent with the levee rehabilitation project constructed on the nearby Briscoe School levee that has proven to be a very effective solution to scour problems – the design slows the river down, provides additional flood storage and allows a vegetated mid-slope bench for habitat improvements. This profile was used to repair two areas of the federally-certified levee in Tukwila – the Lily Point project and the Segale project, which were about 2,000 linear feet of repairs. Costs of these repairs were around $7 million dollars, not including any costs of land acquisition for laying back the levees. It is expected that the use of this levee design or an environmentally superior solution will reduce the need to continually repair the levee in those areas, thus avoiding such high expenditures in the future and saving money in the long run.

Commented [NG11]: However, the Briscoe profile was not used in the more recent levee reconstruction in Kent.

The profile discussed above is illustrated in Figure 2 below:

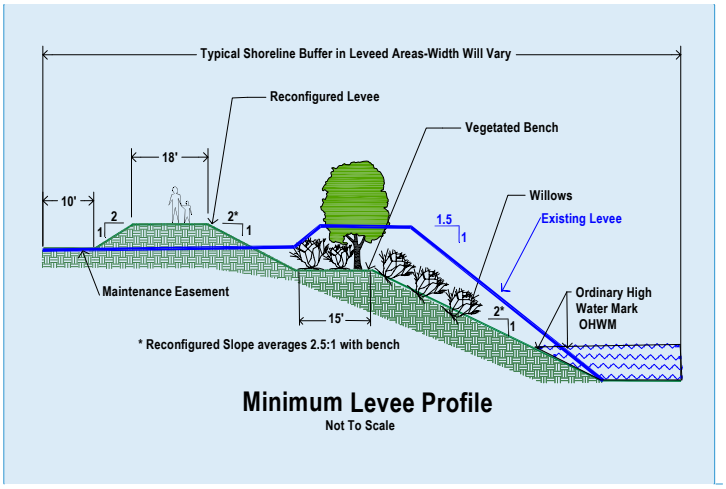


Figure 2. Briscoe Levee Profile

Because of the similarities in the soil conditions and taking into consideration the tidal influence, the Green/Duwamish River can be divided into three areas – South of I-405; North of I-405; and areas around residential neighborhoods. Looking at the slope geometry and the difference in height between the ordinary high water mark and the 100-year flood elevation for these three areas, it was found that 125-feet of setback distance (buffer) is needed to accommodate the *"lay back"* of the levee in the area south of I-405 and around Fort Dent Park.[2] During high flow events, the water surface can be as much as 16 feet above the OHWM in these areas. At locations further downriver, the water surface elevation difference is much less pronounced due to the wider channel and proximity to Puget Sound. For areas without levees, north of I-405 and those areas south of I-405 on the east side of the river (right bank), a 100-foot setback distance is required to accommodate the slopes needed for bank stability. Within residential neighborhoods, a minimum 50-foot setback is justified because of the less intense land use associated with single-family home construction and the estimated amount of space needed to achieve the natural angle of repose for a more stable slope.

Even though the above explanation for determining appropriate buffer distance used levee design as the example, the same problems exist where there are no levees. The river makes no distinction between an over-steepened slope associated with a levee or a riverbank. Scouring within the river will cause sloughing and slope stability will be weakened, potentially resulting in the loss of structures. In fact, the non-leveed riverbank

[2] The 125 foot distance includes a slope no steeper than 2.5:1 with a mid-slope bench incorporated, 18 feet at the top of the levee and 10 feet on the back side of the levee for access and inspection.

Commented [AMS12]: Figure should be renamed Briscoe Levee Profile

can be more prone to these problems since they tend to be steeper and consist mainly of sand and silt. This makes them susceptible to erosion. Because the non-leveed riverbanks are for the most part privately owned, they are not actively monitored for damage by the City or County.

C. Conclusions

The determination of buffer widths was based on two important criteria: the need to achieve bank stability and protect structures along the shoreline from damage due to erosion and bank failures and to protect and enhance shoreline ecological function.

Applying the 200 to 250 foot buffer widths recommended by WDFW and WDNR would not be practical given the developed nature of the shoreline. It was also felt that a buffer less than that already established for Type 2 Watercourses under the City's SAO would not be sufficiently protective of shoreline functions, unless those functions were enhanced through various restoration options. Therefore, 100 feet was established as the starting point for considering buffer widths from the standpoint of shoreline ecological function in each of the Shoreline Environments. Between 100 and 125 feet was the starting point for buffer widths from the standpoint of bank stability and property protection.

Thus buffers were established taking into account (as explained in the following sections) the characteristics of each Shoreline Environment, needs for protection/restoration of shoreline ecological functions, and needs for stable banks and human life and property protection.

7.6 Shoreline Residential Environment

A. Designation Criteria: All properties zoned for single-family use from the ordinary high water mark landward two-hundred (200) feet. In addition, those areas zoned for single family use but developed for public recreation or open space within 200 feet of the shoreline shall also be designated Shoreline Residential, except Fort Dent Park.

B. Purpose of Environment and Establishment of River Buffer: The purpose of the Shoreline Residential Environment is to accommodate urban density residential development, appurtenant structures, public access and recreational activities. However, within the 200 foot shoreline jurisdiction in the Shoreline Residential Environment there will be a protective buffer along the river, where development will be limited to protect shoreline function.

The purpose of the river buffer in the shoreline residential environment is to:

- Ensure no net loss to shoreline ecological functions;

- Help protect water quality and habitat function by limiting allowed uses;
- Protect existing and new development from high river flows by ensuring sufficient setback of structures;
- Promote restoration of the natural character of the shoreline environment; and
- Allow room for reconstructing over-steepened river banks to achieve a more stable slope and more natural shoreline bank conditions and avoid the need for shoreline armoring.

C. Analysis of Development Character of Residential Shoreline: An analysis was prepared that looked at the residential properties along the shoreline and identified the number of parcels with structures within 50 feet and 100 feet of the OHWM. This analysis showed the following:

ZONE	Number of parcels within 50 feet of OHWM	Number of vacant parcels within 50 feet	Number of parcels with structures within 50 feet/%	Number of parcels within 100 feet of OHWM	Number of vacant parcels within 100 feet	Number of parcels with structures within 100 feet/%
LDR	135	12	67/49%	201	25	165/82%

As can be seen from the chart above, almost half of the parcels in the residential neighborhoods have a structure within 50 feet of the OHWM – a direct result of the current King County regulations. To apply a buffer width that is consistent with the City's Sensitive Areas Ordinance (SAO) of 100 feet would create a situation where 82% of the properties along the river would have nonconforming structures as they relate to the proposed shoreline buffer.

Expansion of single family nonconforming structures in the proposed SMP buffer would be governed by Section 14.5 of the SMP, which permits an expansion of only 50% of the square footage of the current area that intrudes into the buffer and only along the ground floor of the structure. For example, if 250 square feet of a building extended into the proposed buffer, the ground floor could be expanded a maximum of 125 feet in total area along the existing building line.

A buffer of 100 feet was considered for the shoreline residential properties, with the potential of a property owner applying for a buffer reduction of 50%, however, under the Shoreline Management Act, this would have required an application for a shoreline variance for each requested buffer reduction, a process that requires review and approval both at the local and state level (Ecology must review and approve the variance in addition to the City of Tukwila). This did not seem a reasonable process to require of so many property owners.

The river bank in the Shoreline Residential Environment is typically in a modified and degraded state but generally not stabilized with revetments, dikes or levees. Based on an analysis of the river elevations and existing banks, a 50 foot minimum buffer in the Shoreline Residential Environment would allow room to achieve a 2.5:1 bank slope with an additional 20 foot setback from the top of the slope – a distance that will allow for bank stability and in-turn, protection of new structures from high flows, and bank failures. A schematic of the shoreline jurisdiction showing the buffer is provided in Figure 3.

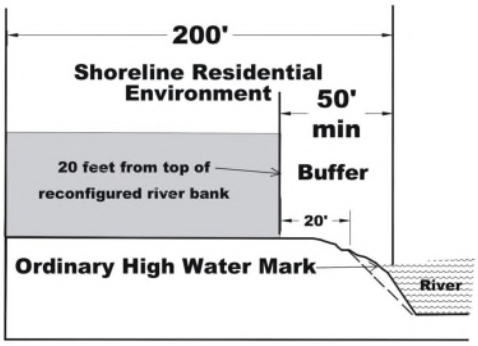


Figure 3. Schematic of Shoreline Residential Environment and Buffer

The proposed buffer area for the Shoreline Residential Environment will allow for removal of invasive plants, planting of native vegetation in the riparian zone and inclusion of other features to improve shoreline habitat. It also will prevent the placement of any structures in an area that could potentially prove unstable. In the event of bank erosion or slope failures, the buffer will provide sufficient space for re-sloping the bank to a more stable 2.5:1 slope, either through bank stabilization projects or through natural bank failures that result in the natural angle of repose (2.5:1 or greater).

7.7 Urban Conservancy Environment

A. Designation Criteria: This environment will be designated in the area between the Ordinary High Water Mark and 200 feet landward as regulated under the Shoreline Management Act and applied to all shorelines of the river except the Shoreline Residential Environment and the High Intensity Environment. The Urban Conservancy Environment areas are currently developed with dense urban multifamily, commercial, industrial and/or transportation uses or are designated for such uses in the proposed south annexation area. This environment begins at the southern end of the Turning Basin and includes portions of the river where levees and revetments generally have been constructed and where the river is not navigable to large water craft. Uses will be restricted immediately adjacent to the river by establishment of a minimum protective buffer.

B. Purpose of Environment: The purpose of the Urban Conservancy Environment is to protect ecological functions where they exist in urban and developed settings, and restore ecological functions where they have been previously degraded, while allowing a variety of compatible uses.

C. Establishment of River Buffers: The Urban Conservancy environment will have two different buffers, depending on the location along the river and whether or not the shoreline has a flood control levee. The purpose of Urban Conservancy River Buffers is to:

- Protect existing and restore degraded ecological functions of the open space, floodplain and other sensitive lands in the developed urban settings;
- Ensure no net loss of shoreline function when new development or re-development is proposed;
- Provide opportunities for restoration and public access;
- Allow for adequate flood and channel management to ensure protection of property, while accommodating shoreline habitat enhancement and promoting restoration of the natural character of the shoreline environment, wherever possible;
- Avoid the need for new shoreline armoring; and
- Protect existing and new development from high river flows.

Buffer in Non-Levee Areas:

A buffer width of 100 feet is established for the Urban Conservancy Environment for all non-residential areas without levees. This buffer width is consistent with that established by the City's Sensitive Areas Ordinance for Type 2 streams that support salmonid use, which is based on Best Available Science. In addition, as noted above, looking at the slope geometry and the difference in height between the ordinary high water mark and the 100-year flood elevation for these areas, it was found that a 100-foot setback distance is required to accommodate the slopes needed for bank stability.

The buffer width of 100 feet allows enough room to reconfigure the river bank to achieve a slope of 2.5:1, the "angle of repose" or the maximum angle of a stable slope and allow for some restoration and improvement of shoreline function through the installation of native plants and other habitat features. The actual amount of area needed to achieve a 2.5:1 slope may be less than 100 feet, depending on the character of the river bank and can only be determined on a site-by-site basis.

As an alternative to the 100 foot buffer, a property owner may re-slope the river bank to be no steeper than 3:1, provide a 20 foot setback from the top of the new slope and vegetate both the river bank and the 20 foot setback area in accordance with the standards in the Vegetation Protection and Landscaping Section. Any buffer reduction proposal

Commented [NG13]: The proposal is to change the standard for buffer reductions from 2.5:1 to 3:1 to provide greater slope stability and ease of planting. This can be accommodated within the existing 100' buffer width.

must demonstrate to the satisfaction of the Director that it will not result in direct, indirect or long-term adverse impacts to shoreline ecosystem functions. In all cases a buffer enhancement plan must also be approved and implemented as a condition of the reduction. The plan must include removal of invasive plants, and plantings using a variety of native vegetation that improves the functional attributes of the buffer and provides additional protection for the watercourse functions. In no case shall the buffer be less than 50 feet.

In areas of the river where this condition currently exists or where the property owner has constructed these improvements, the buffer width will be the actual distance as measured from the ordinary high water mark to the top of the bank plus 20 feet.
The shoreline jurisdiction and buffers for the Urban Conservancy Environment are depicted in the schematic in Figures 4 and 5 below.

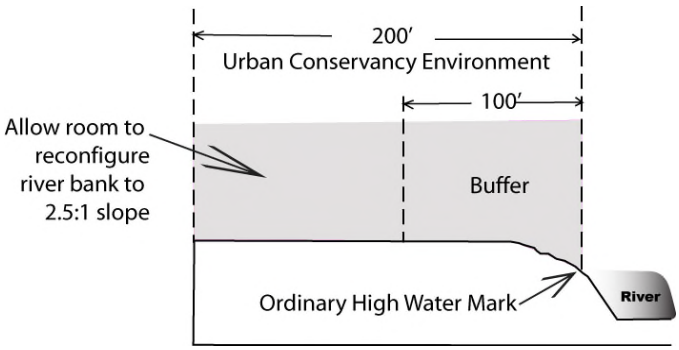


Figure 4. Schematic of Shoreline Jurisdiction and Buffers for the Urban Conservancy Environment in Areas without Levees

Buffer in Levee Areas:

For properties located behind the Army Corps of Engineers (ACOE) Certified 205 levee and County constructed levees, the buffer will extend 125 feet landward from the ordinary high water mark, determined at the time of development or redevelopment of the site or when levee replacement or repair is programmed. This buffer width is the maximum needed to reconfigure the river bank to the minimum levee profile and to achieve an overall slope of 2.5:1, the "angle of repose" or the maximum angle of a stable slope. The establishment of the 2.5:1 slope along the Corps certified 205 levee in the Tukwila Urban Center will allow for incorporating a mid-slope bench that can be planted with vegetation to improve river habitat. The mid-slope bench also will allow access for maintenance equipment, when needed. A fifteen foot easement necessary to allow access for levee inspection is required on the landward side of the levee at the toe.

Commented [NG14]: The Briscoe profile was not used in the more recent levee reconstruction in Kent as other engineering solutions can also provide environmental enhancement and flood protection.

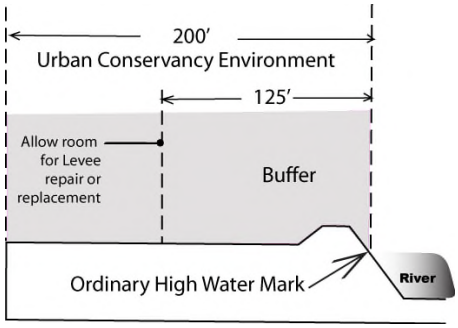


Figure 5. Schematic of Shoreline Jurisdiction and Buffers for the Urban Conservancy Environment in Areas with Levees

As an alternative to the 125 foot buffer for leveed areas, a property owner may construct levee or riverbank improvements that meet the Army Corps of Engineers, King County Flood Control District, and City of Tukwila minimum levee standards. These standards at a minimum shall include an overall slope no steeper than 2.5:1 from the toe of the levee to the riverward edge of the crown, 16' access across the top of the levee, a 2:1 back slope, and an additional 15 foot no-build area measured from the landward toe for inspection and repairs. In instances where an existing building that has not lost its nonconforming status prevents achieving an overall slope of 2.5:1 the slope should be as close to 2.5:1 as possible.

A floodwall is not the preferred back slope profile for a levee but may be substituted for all or a portion of the back slope where necessary to avoid encroachment or damage to a structure legally constructed prior to the date of adoption of this Master Program which has not lost its nonconforming status and to preserve access needed for building functionality. The floodwall shall be designed to provide 15' (fifteen foot) clearance between the levee and the building or to preserve access needed for building functionality while meeting all engineering safety standards. A floodwall may also be used where necessary to avoid encroachment on a railroad easement or to provide area for waterward habitat restoration.

In areas of the river where the property owner or a government agency has constructed a levee with an overall waterward slope of 2.5:1 or flatter, the buffer will be reduced to the actual distance as measured from the ordinary high water mark to the landward toe of the levee or face of a floodwall, plus 15 feet. In the event that the owner provides the City and/or applicable agency with a 15-foot levee maintenance easement measured landward from the landward toe of the levee or levee wall (which easement prohibits the construction of any structures and allows the City and/or applicable agency to access the area to inspect the levee), then the buffer shall be reduced to the landward toe of the levee, or landward edge of the levee floodwall, as the case may be.

In cases where fill is placed along the back slope of the levee, the shoreline buffer may be

further reduced to the point where the ground plane intersects the back slope. The area between the landward edge of the buffer and a point fifteen (15) feet landward of the underground levee toe shall be covered by an easement prohibiting the construction of any structures and allowing the City and/or applicable agency to access the area to inspect the levee and/or floodwall and make any necessary repairs. See Figure 5 below.

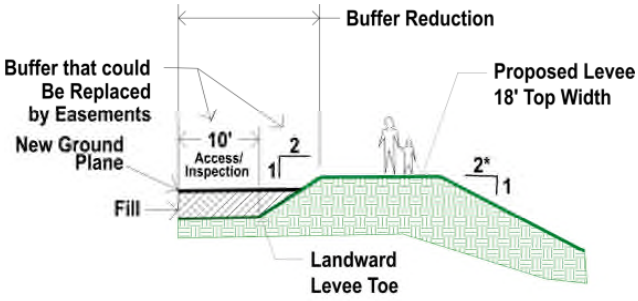


Figure 6. Schematic of Buffer Reduction Through Placement of Fill on Levee Back Slope

7.8 High Intensity Environment

A. Designation Criteria: The High Intensity Shoreline Environment area is currently developed with high intensity urban commercial, industrial and/or transportation uses or is designated for such uses in the proposed north annexation area. This environment begins at the Ordinary High Water Mark and extends landward 200 feet and is located from the southern edge of the Turning Basin north to the City limits and includes the North PAA. This Environment is generally located along portions of the Duwamish River that are navigable to large watercraft. Uses will be restricted immediately adjacent to the river by establishment of a minimum protective buffer.

The transition zone is located partly in the High Intensity Environment. The transition zone is the location where freshwater from a river and saltwater from the marine salt wedge mix creating brackish conditions. Often it is also where the river widens, stream velocities decrease and estuarine mudflats begin to appear. Habitat associated with the transition zone is critically important for juvenile Chinook and chum smolts making the transition to salt water. The transition zone moves upstream and downstream in response to the combination of stream flow and tidal elevations and as a result varies over a twenty-four hour period and seasonally. The transition zone is a crucial habitat for salmonids.

B. Purpose of Environment and Establishment of River Buffer: The purpose of the Urban High Intensity Environment is to provide for high intensity, commercial, transportation and industrial uses and to promote water dependent and water oriented uses while protecting existing shoreline ecological functions and restoring ecological functions in areas that have been previously degraded.

The purposes of the High Intensity River Buffer are to:

- Protect existing and restore degraded ecological functions of the open space, floodplain and other sensitive lands in the developed urban settings;
- Ensure no net loss of shoreline function when new development or re-development occurs;
- Provide opportunities for shoreline restoration and public access;
- Allow for adequate flood and channel management to ensure protection of property, while accommodating shoreline habitat enhancement and promoting restoration of the natural character of the shoreline environment, wherever possible;
- Avoid the need for new shoreline armoring; and
- Protect existing and new development from high river flows.

A buffer of 100 feet is established, which allows enough room to reconfigure the river bank to achieve a slope of 3:1, (starting at the OHWM rather than the toe) the "angle of repose" or the maximum angle of a stable slope and allow for some restoration and improvement of shoreline function through the installation of native plants and other habitat features. The actual amount of area needed to achieve a 3:1 slope may be less than 100 feet, depending on the character of the river bank and can only be determined on a site-by-site basis.

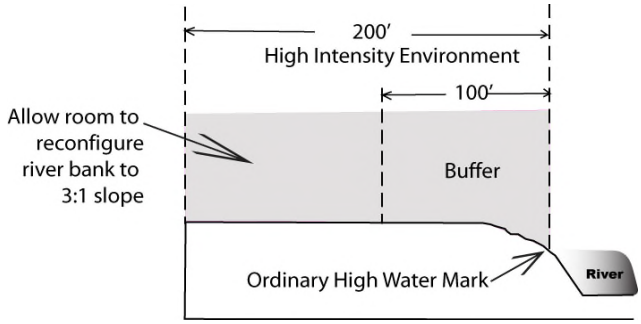


Figure 7. Schematic Showing the Proposed Shoreline Jurisdiction and Buffer for the High Intensity Environment

As an alternative to the 100 foot buffer, a property owner may re-slope the river bank to a maximum-3:1, provide a 20 foot setback from the top of the new slope and vegetate both the river bank and the 20 foot setback area in accordance with the standards in the Vegetation Protection and Landscaping Section. The property owner must also demonstrate that this approach will not result in a loss of ecological functions of the shoreline. In areas of the river where this condition currently exists or where the property owner has constructed these improvements, the buffer width will be the actual distance as measured from the Ordinary High Water Mark to the top of the bank plus 20 feet. In no case shall the buffer be less than 50 feet.

In any shoreline environment where an existing improved street or road runs parallel to the river through the buffer, the buffer would end on the river side of the street or road.

Section 7.9 Aquatic Environment

A. Designation Criteria: All water bodies within the City limits and its potential annexation area under the jurisdiction of the Shoreline Management Act waterward of the ordinary high water mark. The aquatic environment includes the water surface together with the underlying lands and the water column.

B. Purpose: The purpose of this designation is to protect the unique characteristics and resources of the aquatic environment by managing use activities to prioritize preservation and restoration of natural resources, navigation, recreation and commerce and by assuring compatibility between shoreland and aquatic uses.

8. SHORELINE USE REGULATIONS AND DEVELOPMENT STANDARDS

Uses that are permitted outright, permitted as a Conditional Use, or prohibited altogether for each Shoreline Environment are provided in TMC 18.44.030 along with special conditions and general requirements controlling specific uses. These regulations are intended to implement the purpose of each Shoreline Environment designation adopted with this SMP. Development standards such as setbacks, height limitations, water quality regulations, flood hazard reduction, shoreline stabilization, protection of archaeological resources, environmental impact mitigation, parking and over water structures requirements are codified in TMC Chapter 18.44.

The Administrative procedures codified in TMC Chapter 18.44 are designed to:

- Assign responsibilities for implementation of the Master Program and Shoreline Permits.
- Establish an orderly process by which to review proposals and permit

applications.

- Ensure that all persons affected by this Master Program are treated in a fair and equitable manner.

These procedures include permit application requirements, conditional use approval criteria, variance approval criteria, and regulations for non-conforming development.

9. ENVIRONMENTALLY CRITICAL AREAS WITHIN THE SHORELINE JURISDICTION.

9.1 Applicable Critical Areas Regulations

Commented [NG15]: The proposal is to adopt the revised critical areas regulations by reference rather than duplicating them in the SMP and Zoning Code.

A. The following critical areas shall be regulated in accordance with the provisions of the Critical Areas Ordinance TMC Chapter 18.45, adopted [Date to be added], which is herein incorporated by reference into this SMP, except for the provisions excluded in subsection B of this Section:

1. Wetlands
2. Watercourses (Type F, Type Np, Type Ns)
3. Areas of potential geologic instability
4. Abandoned mine areas
5. Fish and wildlife habitat conservation areas

Such critical area provisions shall apply to any use, alteration, or development within shoreline jurisdiction whether or not a shoreline permit or written statement of exemption is required. Unless otherwise stated, no development shall be constructed, located, extended, modified, converted, or altered, or land divided without full compliance with the provision adopted by reference and the Shoreline Master Program. Within shoreline jurisdiction, the regulations of TMC Chapter 18.45 shall be liberally construed together with the Shoreline Master Program to give full effect to the objectives and purposes of the provisions of the Shoreline Master Program and the Shoreline Management Act. If there is a conflict or inconsistency between any of the adopted provisions below and the Shoreline Master Program, the most restrictive provisions shall prevail.

B. The following provisions of TMC Chapter 18.45 do not apply within the Shoreline jurisdiction:

1. Sensitive Area Master Plan Overlay (TMC Section 18.45.160)
2. Reasonable Use Exception (TMC Section 18.45.180).

C. Critical areas comprised of frequently flooded areas and areas of seismic instability are regulated by the Flood Zone Management Code (TMC Chapter 16.52) and

the Washington State Building Code, rather than by TMC Section 18.44.090.

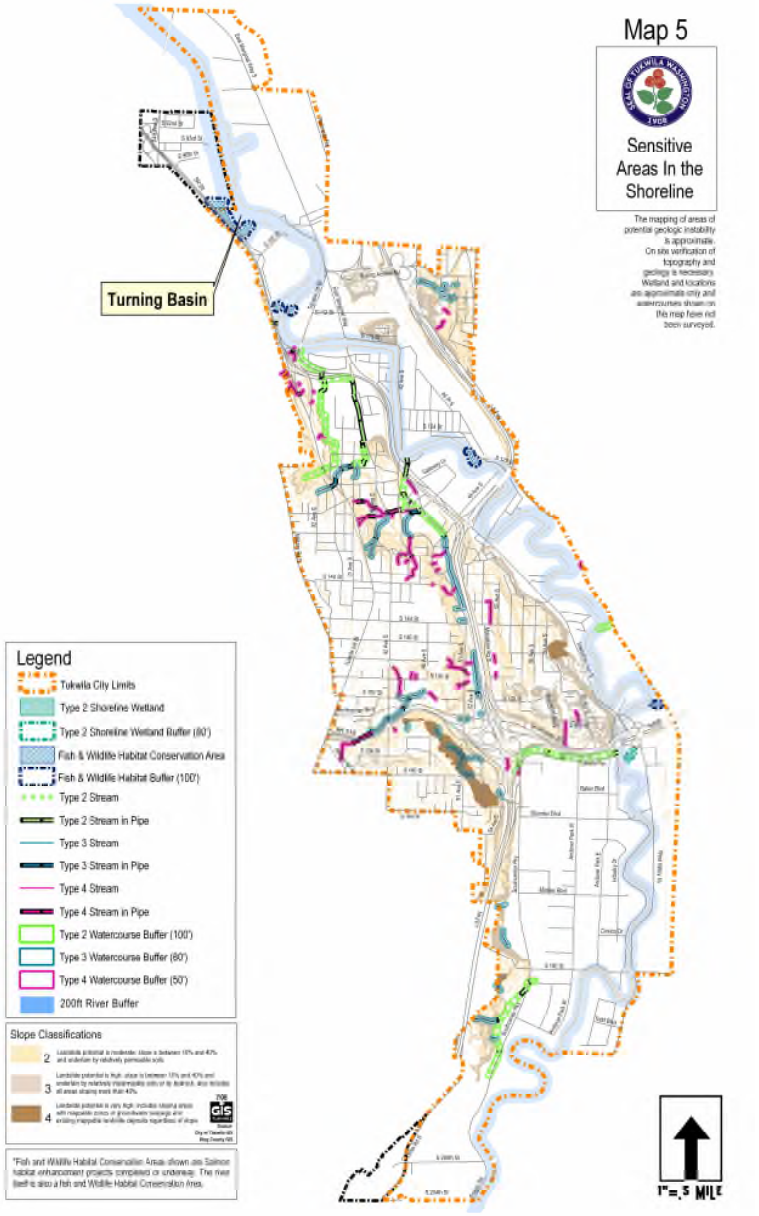
9.2 Purpose

A. The Growth Management Act (RCW 36.70A) requires protection of critical areas (sensitive areas), defined as wetlands, watercourses, frequently flooded areas, geologically hazardous areas, critical aquifer recharge areas, fish and wildlife conservation areas, and abandoned mine areas.

B. The purpose of protecting environmentally critical areas within the shoreline jurisdiction is to:

1. Minimize developmental impacts on the natural functions and values of these areas.
2. Protect quantity and quality of water resources.
3. Minimize turbidity and pollution of wetlands and fish-bearing waters and maintain wildlife habitat.
4. Prevent erosion and the loss of slope and soil stability caused by the removal of trees, shrubs, and root systems of vegetative cover.
5. Protect the public against avoidable losses, public emergency rescue and relief operations cost, and subsidy cost of public mitigation from landslide, subsidence, erosion and flooding.
6. Protect the community's aesthetic resources and distinctive features of natural lands and wooded hillsides.
7. Balance the private rights of individual property owners with the preservation of environmentally sensitive areas.
8. Prevent the loss of wetland and watercourse function and acreage, and strive for a gain over present conditions.
9. Give special consideration to conservation or protection measures necessary to protect or enhance anadromous fisheries.
10. Incorporate the use of best available science in the regulation and protection of critical areas as required by the state Growth Management Act, according to WAC 365-195-900 through 365-195-925 and WAC 365-190-080.

C. The goal of these critical area regulations is to achieve no net loss of wetland, watercourse, or fish and wildlife conservation area or their functions. Critical areas currently identified in the shoreline jurisdiction are discussed in the Shoreline Inventory and Characterization Report, which forms part of this Shoreline Master Program. The locations are mapped on the Sensitive Areas in the Shoreline Jurisdiction Map – Map 5. This map is based on assessment of current conditions and review of the best available information. However, additional sensitive areas may exist within the shoreline jurisdiction and the boundaries of the sensitive areas shown are not exact. It is the responsibility of the property owner to determine the presence of sensitive areas on the property and to verify the boundaries in the field. Sensitive area provisions for abandoned mine areas do not apply as none of these areas is located in the shoreline jurisdiction.


Map 5
Sensitive Areas In the Shoreline
Turning Basin
Legend
Tukwila City Limits
Type 2 Shoreline Wetland
Type 2 Shoreline Wetland Buffer (80')
Fish & Wildlife Habitat Conservation Area
Fish & Wildlife Habitat Buffer (100')
Type 2 Stream
Type 2 Stream in Pipe
Type 3 Stream
Type 3 Stream in Pipe
Type 4 Stream
Type 4 Stream in Pipe
Type 2 Watercourse Buffer (100')
Type 3 Watercourse Buffer (80')
Type 4 Watercourse Buffer (50')
200ft River Buffer
Slope Classifications
2
3
4
1"=.5 MILE

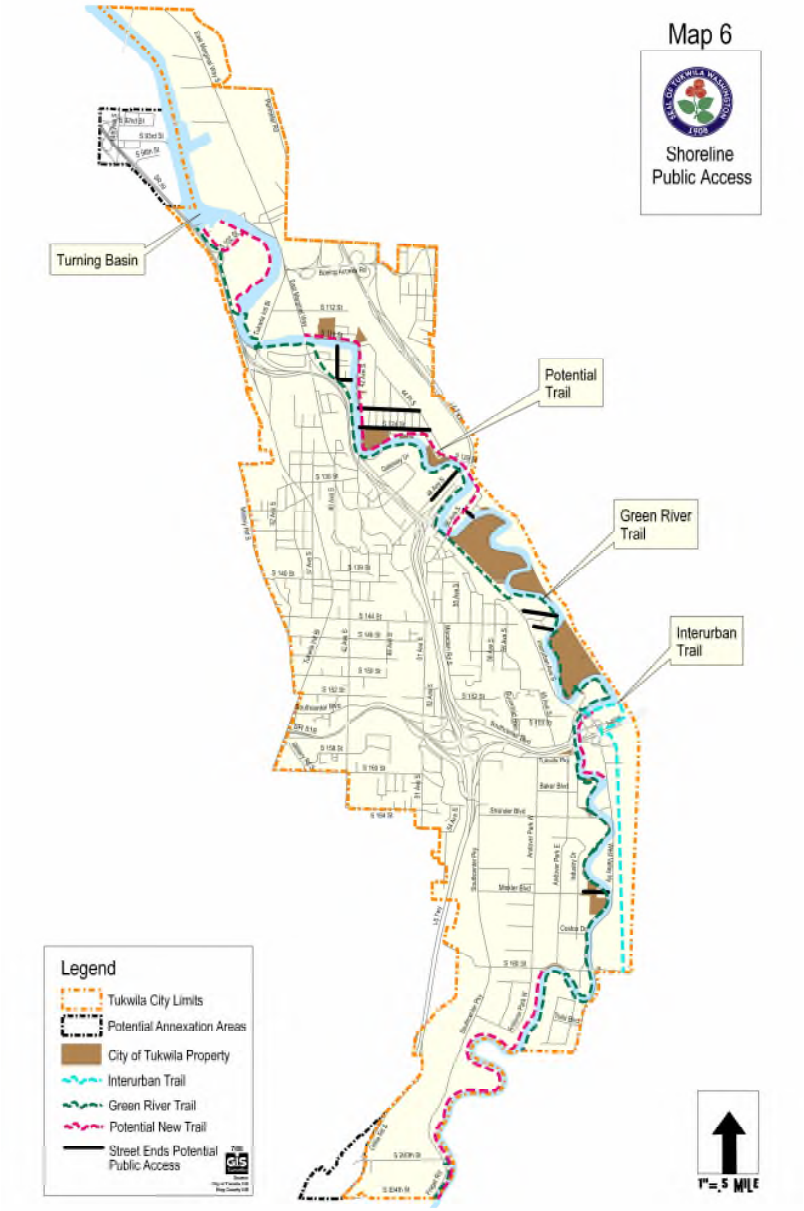
10. PUBLIC ACCESS TO THE SHORELINE

Public access to the shorelines of the state is one of the key goals of the Shoreline Management Act – of the seven uses identified in RCW 90.58.020 as having preference in the shoreline, two relate to public access and recreational opportunities along the shoreline.

The City of Tukwila is fortunate to have a number of public access sites already along the Green/Duwamish River in addition to the Green River Trail, which runs along almost the entire length of the river through the City. Other public access points are available at the North Winds Wier, the Tukwila Community Center, Codiga Park, Bicentennial Park at Strander Boulevard and parking available on Christianson Road and at S. 180th Street. A habitat restoration project is underway at Duwamish Riverbend Hill, on South 115th Street, which also includes public access to the river. The Public Access Map (**Map 6**) identifies several street ends that could be improved or to which amenities could be added that would offer opportunities for neighborhood access to the river and/or the Green River Trail.

The Shoreline Public Access Map identifies several potential trail sites on the river to supplement the existing Green River trail system. The largest stretch of potential trail runs from S. 180th on the left bank to the end of south annexation area. A pedestrian bridge to link the area south of S. 180th Street to the existing trail on the right bank is being discussed as well. A second area where improvement is needed in public access relates to boat launches for small hand launched boats. Several potential sites have been identified in the Tukwila Parks Department Capital Improvement Program to address this need at City-owned sites.

Requirements for public access to shorelines have been codified in TMC Chapter 18.44.


Map 6
Shoreline Public Access
Turning Basin
Potential Trail
Green River Trail
Interurban Trail
Legend
Tukwila City Limits
Potential Annexation Areas
City of Tukwila Property
Interurban Trail
Green River Trail
Potential New Trail
Street Ends Potential Public Access
1"=.5 MILE

11. SHORELINE DESIGN GUIDELINES

The Green/Duwamish River is an amenity that should be valued and celebrated when designing projects that will be located along its length. The river and its tributaries support salmon runs and resident trout, including the ESA-listed Chinook salmon, Bull Trout and Steelhead. If any portion of a project falls within the shoreline jurisdiction, then the entire project will be reviewed under the shoreline specific guidelines codified in TMC Chapter 18.44 as well as the relevant sections of the Design Review Chapter of the Zoning Code (TMC Chapter 18.60). The standards of TMC Chapter 18.60 shall guide the type of review, whether administrative or by the Board of Architectural Review.

The standards apply to development, uses and activities in the Urban Conservancy and High Intensity Environments and non-residential development in the Shoreline Residential Environment.

12. SHORELINE RESTORATION

The Shoreline Restoration Plan, found in Appendix B, identifies the sites that have been identified to-date as possible locations for habitat restoration along the Green/Duwamish River. The City will continue to add sites to the Restoration Plan as they are identified and will include them in the City's Capital Improvement Program for acquisition and improvement. Project sites in the Transition Zone have the highest priority for acquisition. Amendments or revisions to the Restoration Plan do not require an amendment to the Shoreline Master Program.

13. ADMINISTRATION

Commented [NG16]: Administrative procedures have been codified in TMC 18.44.

The Administrative procedures below are designed to:

- Assign responsibilities for implementation of the Master Program and Shoreline Permit
- Establish an orderly process by which to review proposals and permit applications
- Ensure that all persons affected by this Master Program are treated in a fair and equitable manner.

13.1 Applicability of Shoreline Master Program and Substantial Development Permit

A. Development in the Shoreline Jurisdiction

Based on guidelines in the Shoreline Management Act for a minimum shoreline jurisdiction, Tukwila's Shoreline Jurisdiction is defined as follows:

> *The Tukwila Shoreline Jurisdiction includes the channel of the Green/Duwamish River, its banks, the upland area which extends from the ordinary high water mark landward for 200 feet on each side of the river, floodways and all associated wetlands within its floodplain. The floodway shall not include those lands that have historically been protected by flood control devices and therefore have not been subject to flooding with reasonable regularity.*

B. Applicability

The Tukwila Shoreline Master Program applies to uses, change of uses, activities or development that occurs within the above-defined Shoreline jurisdiction. All proposed uses and development occurring within the shoreline jurisdiction must conform to chapter 90.58 RCW, the Shoreline Management Act and this Master Program whether or not a permit is required. Except that requirements to obtain a substantial development permit, conditional use permit, variance, letter of exemption, or other review to implement the Shoreline Management Act do not apply to the following described in WAC 173-27-044 and WAC 173-27-045:

1. Remedial actions. Pursuant to RCW 90.58.355, any person conducting a remedial action at a facility pursuant to a consent decree, order, or agreed order issued pursuant to chapter 70.105D RCW, or to the department of ecology when it conducts a remedial action under chapter 70.105D RCW.

2. Boatyard improvements to meet NPDES permit requirements. Pursuant to RCW 90.58.355, any person installing site improvements for storm water treatment in an existing boatyard facility to meet requirements of a national pollutant discharge elimination system storm water general permit.

3. WSDOT facility maintenance and safety improvements. Washington State Department of Transportation projects and activities meeting the conditions of RCW 90.58.356 are not required to obtain a substantial development permit, conditional use permit, variance, letter of exemption, or other local review.

4. Projects consistent with an environmental excellence program agreement pursuant to RCW 90.58.045. (v) Projects authorized through the Energy Facility Site Evaluation Council process, pursuant to chapter 80.50 RCW.

13.2 Relationship to Other Codes and Regulations

1. Compliance with this Master Program does not constitute compliance with other federal, state, and local regulations and permit requirements that may apply. The applicant is responsible for complying with all other applicable requirements.
2. Where this Master Program makes reference to any RCW, WAC, or other state or federal law or regulation, the most recent amendment or current edition shall apply.
3. When any provision of this Master Program or any other federal, state, or local provision conflicts with this Master Program, the provision that is most protective of shoreline resources shall prevail, except when constrained by federal or state law, or where specifically provided otherwise in this Master Program.
4. Relationship to Sensitive Areas Regulations.
   A. For protection of critical areas where they occur in shoreline jurisdiction, this Master Program adopts by reference the City's Critical Areas Ordinance, which is incorporated into this Master Program with specific exclusions and modifications in Section 10 of this SMP.
   B. All references to the Critical Areas Ordinance are for the version adopted [SAO adoption date]. Pursuant to WAC 173-26-191(2)(b), amending the referenced regulations in the Master Program for those critical areas under shoreline jurisdiction will require an amendment to the Master Program and approval by the Department of Ecology.
   C. Within shoreline jurisdiction, the Critical Areas Ordinance shall be liberally construed together with this Master Program to give full effect to the objectives and purposes of the provisions of this Master Program and Chapter 90.58 RCW.

14. APPEALS

Any appeal of a decision by the City on a Shoreline Substantial Development Permit, Shoreline Conditional Use, Unclassified Use or Shoreline Variance must be appealed to the Shoreline Hearing Board.

Commented [NG17]: Permit requirements and non-conforming standards have been codified at TMC 18.44.

Commented [NG18]: Enforcement provisions have been codified in TMC 18.44.

15. MASTER PROGRAM REVIEW AND AMENDMENTS

15.1. This Master Program shall be periodically reviewed and adjustments shall be made as are necessary to reflect changing local circumstances, new information or improved data, and changes in State statutes and regulations. This review process shall be consistent with WAC 173-26 and shall include a local citizen involvement effort and public hearing to obtain the views and comments of the public.

15.2 Any provision of this Master Program may be amended as provided for in RCW 90.58.080 and WAC 173-26-090. Amendments or revisions to the Master Program, as provided by law, do not become effective until 14 days following written approval by the Washington State Department of Ecology.

15.3 Proposals for shoreline environment re-designations (i.e. amendments to the shoreline maps and descriptions) must demonstrate consistency with the criteria set forth in WAC 173- 26-040 and this program.

16. LIABILITY

16.1. Liability for any adverse impacts or damages resulting from work performed in accordance with a Permit issued on behalf of the City within the City limits, shall be the sole responsibility of the owner of the site for which the Permit was issued.

16.2 No provision of or term used in the Master Program is intended to impose any duty upon the City or any of its officers or employees that would subject them to damages in a civil action.