(DRAFT) AGENDA
Regular Meeting - Bremerton Planning Commission
(Subject to PC approval)
January 17, 2012
5:30 P.M.
345 – 6th Street
Meeting Chamber – First Floor

I. CALL TO ORDER
II. ROLL CALL (quorum present)
III. APPROVAL OF THE AGENDA
IV APPROVAL OF MINUTES:
- November 15, 2011 Regular meeting.

V. PUBLIC MEETING

A. Call to the Public: Public comments on any item not on tonight's agenda

B. Workshop
1. Shoreline Master Program Update to discuss the Restoration Plan and Cumulative Effects Analysis

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VI. BUSINESS MEETING

A. Chair Report: Chairman Hoell

B. Director Report: Andrea Spencer.

C. Old Business:

D. New Business

VII. ADJOURNMENT: The next regular meeting of the Planning Commission is
February 21, 2012
Planning Commission meeting packets are available on-line at
www.ci.bremerton.wa.us

DRAFT
Subject to January 17, 2012 Approval

CITY OF BREMERTON

PLANNING COMMISSION
MINUTES OF REGULAR MEETING
November 15, 2011

CALL TO ORDER:

Chair Hoell called the regular meeting of the Bremerton Planning Commission to order at 5:30 p.m.

ROLL CALL

Commissioners Present	**Staff Present**
Chair Hoell	Andrea Spencer, Director, Department of Community Development
Vice Chair Cockburn	Nicole Floyd, Current Planner, Department of Community Development
Commissioner Jose	
Commissioner Lambert	
Commissioner Mosiman	
Commissioner Streissguth	
Commissioner Tift	

Quorum Certified

APPROVAL OF AGENDA

VICE CHAIR COCKBURN MOVED TO APPROVE THE AGENDA AS PRESENTED. COMMISSIONER STREISSGUTH SECONDED THE MOTION. THE MOTION CARRIED UNANIMOUSLY.

APPROVAL OF MINUTES

Commissioner Tift asked that the October 18th meeting be changed to indicate he arrived on time.

COMMISSIONER JOSE MOVED TO APPROVE THE MINUTES OF OCTOBER 18, 2011 AS AMENDED. COMMISSIONER LAMBERT SECONDED THE MOTION. THE MOTION CARRIED UNANIMOUSLY, WITH COMMISSIONER STREISSGUTH ABSTAINING.

PUBLIC MEETING

Call to the Public (public comments on any item not on the agenda)

Jackie Rossworn, Executive Director, Kitsap Alliance of Property Owners, announced that the Kitsap County Shoreline Master Program (SMP) was recently changed. The previous plan called for 100-foot buffers and 50-foot setbacks within the 200-foot shoreline jurisdiction, but the County has come to understand this is not a reasonable request for properties on the Shoreline. In addition, all existing structures that were developed with proper permits have been made conforming uses. The land associated with existing structures is now treated as a yard and considered conforming, as well. This change is consistent with Senate Bill 5451, which relieves the non-conforming status for properties along the shoreline so that

financing options are not impeded. She recommended that these changes also be incorporated into the City of Bremerton's SMP.

Kimberly Ingham, Bremerton, said that up to this point, she has paid her construction costs out of pocket and has not needed a loan. However, she was recently informed by her financial institution (Peninsula Credit Union) that it would be difficult, if not impossible, for her to obtain financing if her property is classified as "non-conforming" because it would prohibit 100% reconstruction in the event of total loss. She was told that in order to be eligible for loans, properties that would be designated as "non-conforming" under the currently proposed language, should be identified as either "legal grandfathered uses" or "legal, non-conforming grandfathered uses." This change would allow a structure to be replaced entirely, using the same footprint. She summarized the importance of avoiding the stigma of non-conforming properties and submitted an exhibit to staff to further illustrate her concerns. **Chair Hoell** asked if other property owners could experience this same problem. **Ms. Ingham** answered affirmatively. She said the Vice President of Lending from Peninsula Credit Union indicated that her loan would likely be rejected at the appraisal period and not even pass through the system if her property is labeled as non-conforming.

Mike House, Bremerton, noted the current draft of the City's SMP does not include a definition for "no net loss." **Chair Hoell** pointed out that this issue would be covered later on the agenda.

Chuck Shank, Vice President, Kitsap Alliance of Property Owners, suggested the Commission seek input from realtors about how the non-conforming status would impact land-owners along the shoreline. He urged them to carefully consider the non-conforming provisions to make sure they do not harm existing homeowners.

William Palmer, President, Kitsap Alliance of Property Owners, said that as a land-use consultant, he disagrees with the City Attorney's advice to staff that there is no significant difference between conforming and non-conforming uses, particularly with respect to the SMP. While conforming uses can have issues relative to expansion into buffer areas, they are not required to go away. On the other hand, a non-conforming use, by definition, is supposed to be phased out at some point in time. If a structure sustains significant damage as a result of an earthquake, fire, etc. and is not restored before the two-year time limit expires, the use would go away. He also asked that the Commission consider the recent changes made by Kitsap County as a result of Senate Bill 5451.

Abby Burlingame, Central Kitsap, said she works for the Kitsap Association of Realtors, but was present to speak on her own behalf. She urged the Commission to carefully review Senate Bill 5451 to better understand the problems associated with the non-conforming status. This bill provides an opportunity for local governments to declare structures and uses legally conforming. She noted that Senator Ranker sponsored the bill because issues in his district made the problem obvious, and the Washington Association of Realtors also testified on behalf of the bill. She summarized that the issue of non-conformance is a problem that will significantly affect homeowners in the area.

Workshop: Shoreline Master Program Update (Overview of Proposed Definitions and Shoreline Public Access Inventory)

Using a PowerPoint presentation, **Nicole Floyd, City Planner,** provided an update on the SMP elements that have been completed to date. She advised that the workshop would focus on the proposed definitions and the draft Shoreline Public Access Inventory. She announced that there would be no Commission meeting in December, and their last workshop discussion is scheduled for January 17th, at which time the Commission will discuss the proposed Restoration Plan and the Cumulative Impacts Analysis. There will be no meeting in February, and a public open house/public hearing has tentatively been scheduled for March 20th.

Ms. Floyd reviewed that the new code would only apply to new development within the first 200 feet from the shoreline. Remodeling, maintenance and repair of existing development would be exempt from the new code, as would minor expansions that are less than 500 square feet. In answer to public concerns, she clarified that the proposed language would allow a non-conforming structure to be rebuilt 100% if it is destroyed by fire, natural disaster, etc. Therefore, financing should not be a problem.

Ms. Floyd described the process staff used to update the definitions, which are a compilation of the technical terms used in the SMP document. She specifically noted the following:

- Staff reviewed the existing code and eliminated the words that were no longer used.
- Staff added words that are helpful for interpretation.
- To avoid future conflicts, duplicative words from other portions of the Bremerton Municipal Code were not included.
- Staff reviewed definitions from other jurisdictions that have already been through the process.
- The Citizen's Advisory Committee identified additional words to include in the definitions.
- Changes proposed by the Department of Ecology (DOE) were incorporated into the definitions.
- Upon the recommendation from DOE, "no net loss" has not been defined because it is determined on a case-by-case basis.

Ms. Floyd explained that because Bremerton is fully developed and there are not a lot of new places for public access, there are three ways for the City to evaluate and improve public access, which is one of the main goals of the SMP:

1. Require new commercial or redevelopment of commercial projects that are on the shoreline to include a public access feature. This is a requirement in the current code and further clarified in the updated language.
2. Require subdivisions of four or more lots that are on the shoreline to include a public access feature. This is an existing state requirement.
3. Improve existing City-owned facilities along the shoreline such parks, street ends, and sewer pump stations. The Parks Department has a plan for improving park facilities, but other city-owned properties are often overlooked for opportunities.

Ms. Floyd reported that staff created the draft Shoreline Public Access Inventory by reviewing the current condition of what is there now and how the area is currently developed, identifying potential opportunities for new and/or improved access, and identifying barriers to public access such as lack of space, environmental costs, and development costs. She reviewed maps and pictures from the draft Shoreline Public Access Inventory to illustrate existing conditions and identify potential opportunities for improving public access along the shoreline. At the conclusion of her presentation Ms. Floyd specifically invited the Commissioners to identify definitions that should be added or reworded, as well as existing public access areas and potential improvements that were not identified in the draft Shoreline Public Access Inventory.

Commissioner Tift asked if redevelopment of the property adjacent to the Chester Avenue street end would require improved public access. **Ms. Floyd** answered affirmatively. However, because the property is located on top of a high bank, it might not be viable to provide access to the beach. A viewing platform would be one option to improve public access.

Commissioner Cockburn noted three additional street ends that have opportunities for expanded public access to the shoreline: 11th Street, Nipsic Avenue, and one that he is not sure the exact location of.

Commissioner Cockburn asked why no-trespassing signs were put up around the existing pump stations. **Ms. Floyd** said the signs are in place because there is no safe public access from the pump stations to the shoreline. They are not opposed to improvements that provide safe public access.

Commissioner Jose asked staff to identify the definitions that were added at the recommendation of the DOE. **Ms. Floyd** agreed to provide this information. **Commissioner Jose** expressed frustration that no definition was provided in the code for "no net loss." He also pointed out that no definition was provided for "setback."

Chair Hoell asked for clarification of the term "photic zone." **Ms. Floyd** answered that "photic zone" refers to the area where plants will grow under water and is used in the language that talks about the amount of light a dock must penetrate. The definition was added upon the recommendation of the Citizen's Advisory Committee, and the DOE did not comment.

Chuck Shank, Vice President, Kitsap Alliance of Property Owners, said he has a degree in biology and helped develop the Near Shore Marine Waters Aspect Report for Water Quality for the National Commission on Water Quality. He advised that the term "ecological function" means the physical, chemical and biological characteristics of the near shore marine environment. Ecological function can vary widely, depending on conditions. Because it would take an army of people years

to establish all ecological functions along the varying shorelines, "no net loss of ecological function" would be nearly impossible to define.

Mike House, Bremerton expressed concern that because the rules are not clearly defined, it is left to the Community Development staff to interpret what is meant by no net loss, with no opportunity for property owners to argue the staff's decisions. He suggested it is inappropriate for the City to require property owners to hire biologists to complete habitat management plans when the proposed language appears arbitrary and does not provide enough information to clearly understand what the rules are.

Jackie Rossworn, Executive Director, Kitsap Alliance of Property Owners, suggested the Commission and/or staff contact Kitsap County Commissioner Charlotte Garrido to learn more about a proposed plan to construct a bicycle/walking trail from the shipyard all the way to Gorst Creek, and hopefully beyond into Port Orchard.

Abby Burlingame, Central Kitsap, urged the Commission to keep in mind that although the DOE has recommended there be no definition for "no net loss," they will not be responsible if the City is sued because the language is too broad. She suggested the City insert language that requires a biologist's study to determine the natural function of the property when it is purchased and to certify that what is built on the property will not damage the existing ecological functions. She cautioned against allowing staff to make arbitrary decisions on a case-by-case basis. She also cautioned that the more stringent the City's SMP, the more property tax dollars will be lost to neighboring jurisdictions that have chosen to address the issue differently so citizens can retain their property rights. She emphasized that she has never received an answer from staff about why they are opposed to declaring properties along the shoreline as "conforming" rather than "non-conforming."

Commissioner Streissguth asked staff to provide additional information to help the Commission understand the DOE's recommendation to not include a definition for "no net loss." She said she appreciates the public's concern about how this term will be interpreted without additional guidance in the SMP. While she is not convinced that including a definition for "no net loss" is the right approach, the Commission should have additional discussion about the best way to address the issue.

Chair Hoell agreed with Commissioner Streissguth. She reminded the Commission of their initial concern about making the SMP sensible, easy to read and understand, and easy for staff to implement. She also requested staff provide more information about Senate Bill 5451. **Commissioner Streissguth** further requested that the City Attorney be invited to speak to the Commission about the differences between the County's SMP and what is being proposed for the City's SMP. **Ms. Spencer** advised that staff would provide additional information about Senate Bill 5451 and issues related to "no net loss" as part of the public hearing for the draft SMP.

Commissioner Cockburn explained that "no net loss" must be addressed on both a macro (citywide) and a micro (individual lot) scale. Including language in the SMP from a macro scale will not necessarily address the micro scale issues raised by members of the public.

Commissioner Tift pointed out that the definition for "clearing" should read, "The removal of vegetation." He also suggested that a definition for "will" should be added.

Commissioner Jose pointed out that the State has mandated the City update their SMP. He asked staff to comment on what is required by State law and where the City has flexibility as far as implementing regulations, buffer requirements, non-conformities, etc. **Ms. Floyd** said that the draft regulations are intended to define how the City will achieve no net loss from a macro scale. The Cumulative Impact Analysis, which is the next step in the process, will review how well the proposed regulations will achieve no net loss. While the City has some flexibility, specific State criterion must be met. For example, because the City has chosen to require less buffer area, they must improve the function by requiring additional vegetation within the buffer areas so the end result is no net loss. **Commissioner Jose** pointed out that the DOE would reject an SMP update that allows development to occur right up to the shoreline with no buffers. **Ms. Floyd** agreed and reminded the Commission that the DOE has the final say on what the buffers must be.

Commissioner Streissguth said she likes the notion of engaging neighborhoods in future conversations about potential opportunities for public access. **Chair Hoell** commented that the pictures provided by staff helped her to visualize potential opportunities. Because of location, there did not appear to be a significant number of sites that could accommodate

additional amenities such as benches, tables, etc. **Commissioner Streissguth** asked if the draft Shoreline Public Access Inventory has been reviewed by the Parks and Recreation Department. **Ms. Floyd** said the Parks Planner reviewed the document and cautioned that it is appropriate to provide ideas but the inventory should not be too detailed.

Ms. Spencer summarized that the Commission has asked staff to provide more information about "no net loss," particularly the DOE's perspective on the issue. There is a concern that lack of guidance could lead to uncertainty for a permit applicant. The Commission has raised the question of whether it would be appropriate to create a definition for the term or create a guidance document. In addition, the Commission requested additional information about Senate Bill 5451 related to non-conformance. They also asked the Commission to add definitions for "will" and "setback." The Commission identified additional public access opportunities at the Nipsic Avenue and 11th Avenue street ends, and one more street end that will be identified by Commissioner Cockburn. Staff would also provide a list of the definitions that were recommended by the DOE.

Chair Hoell closed the public portion of the meeting and thanked the Citizen's Advisory Committee for their hard work.

BUSINESS MEETING

Chair Report

Chair Hoell did not have any items to report during this portion of the meeting.

Director Report

Ms. Spencer reviewed that Pam Bykonen served as Commission Clerk for seven years. As a result of budget cuts, her position will not be filled, and the minutes will be prepared by an independent minute writer. **Commissioner Streissguth** suggested the Commission send Ms. Bykonen a note to thank her for her many years of service.

Ms. Spencer announced that Commissioner Streissguth's term expires at the end of 2011, and she has decided not to seek another term. She thanked her for her many years of service as a Commissioner. Rather than a regular meeting on December 20th, the Commission agreed to have a holiday get together on December 13th at the Toro Lounge to say goodbye to Commissioner Streissguth. **Chair Hoell** commented that Commissioner Streissguth has been an excellent mentor for her. She thanked her for her service. **Commissioner Streissguth** said it has been an honor to serve with her fellow Commissioners and to serve the City. Planning is a great profession, and the Commissioners have a great honor, privilege and duty to think about the future of the City.

Old Business

There was no old business to discuss.

New Business

There was no new business to discuss.

ADJOURNMENT

The meeting was adjourned at 6:48 p.m.

Respectively Submitted by:

_____ _____

Andrea L Spencer
AICP, Executive Secretary

Lois Hoell
Chair, Planning Commission

Commission Meeting Date: January 17, 1012 Agenda Item: V.B.1

CITY OF BREMERTON, WASHINGTON
PLANNING COMMISSION AGENDA ITEM

AGENDA TITLE:	**Workshop to discuss the Restoration Plan and Cumulative Effects Analysis**
DEPARTMENT:	*Community Development*
PRESENTED BY:	*Nicole Floyd, City Planner and David Sherrard, Parametrix*

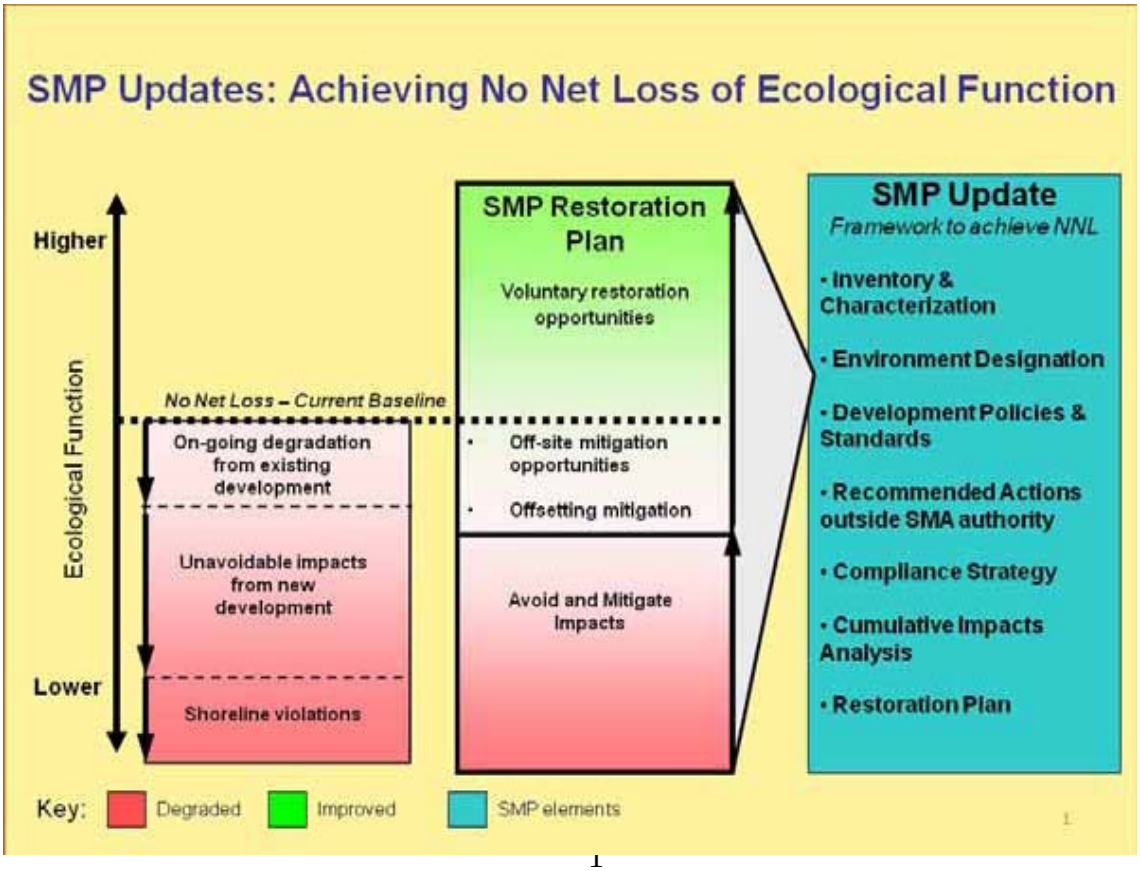
SUMMARY:
This workshop is part of a series of workshops to discuss the Draft Shoreline Master Program (SMP) update. Each workshop focuses on a different set of topics and or sections of the code. This workshop will focus on the following topics:

- Restoration Plan
- Cumulative Effects Analysis

Bremerton's current SMP does not have either of these sections, as they are newly required by the Department of Ecology. Both of these sections directly relate to achieving No Net Loss of ecological functions.

Restoration Plan:

The restoration plan is a document that lists restoration projects and provides potential restoration opportunities within the City. It is a voluntary program to help ensure habitat functions are not depleted over time. The plan does not require restoration on private property nor does it commit privately owned land for restoration purposes without the willing cooperation and participation of the affected landowners.



Landowners may choose to implement actions noted in this plan to meet their mitigation obligations when doing development if they want. Typically restoration activities are undertaken by the public, private, and non-profit organizations. It is through these actions that the City expects to see the greatest improvements to ecological functions.

Cumulative Effects Analysis:

This document is intended to evaluate SMP to determine if the regulatory and non-regulatory requirements will achieve No Net Loss. The document relies on three considerations for evaluating potential long term impacts on ecological functions.

1. Current circumstances as outlined in the Inventory and Characterization Report.
2. Description of foreseeable future development.
3. Beneficial effects of regulatory programs.

Based on this extensive review City and consultant staff have found that the proposal will achieve No Net Loss of ecological functions as required by the State.

Proposed Timeline for Upcoming Meetings:

Staff proposes the following timeline for the Planning Commissions review and recommendation of the Shoreline Master Program.

February 21, 2012 – Workshop to discuss revisions, such as, but not limited to:

- Mapping revisions
- Buffer and setback Averaging
- Residential height limits

March 20, 2012 – Workshop to discuss nonconformities and House Bill 5451

April 17, 2012 – Public Hearing

ATTACHMENTS:
Attachment I: Restoration Plan
Attachment II: Cumulative Effects Analysis

City of Bremerton
Shoreline Master Program

Draft

Restoration Plan

Prepared for

City of Bremerton
Community Development
345 6th Street
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Bremerton, WA 98337-1873

This report was funded in part through a grant from
The Washington Department of Ecology.

Prepared by

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December 2011 | 553-1896-088(02/2.2)

CITATION

Parametrix. 2010. City of Bremerton
Shoreline Master Program
Draft Restoration Plan. Prepared by
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ACRONYMS AND ABBREVIATIONS

BMC	Bremerton Municipal Code
BMP	best management practice
BP	before present
City	City of Bremerton
DAHP	Washington State Department of Archaeology and Historic Preservation
DDT	dichloro-diphenyl-trichloroethane
DO	dissolved oxygen
Ecology	Washington State Department of Ecology
EKNHA	East Kitsap Nearshore Habitat Assessment and Inventory
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
GIS	Geographic Information System
GMA	Growth Management Act
HCP	Habitat Conservation Plan
LWD	large woody debris
NCDC	National Climate Data Center
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OHWM	ordinary high water mark
PAA	Potential Annexation Area
PAH	polynuclear aromatic hydrocarbon
PCB	polychlorinated biphenyl
PSBRT	Puget Sound Biological Review Team
PSNERP	Puget Sound Nearshore Ecosystem Restoration Project
RCW	Revised Code of Washington
RM	river mile
ROW	right-of-way
SASSI	Salmon and Steelhead Stock Inventory
SKIA	South Kitsap Industrial Area
SMA	Shoreline Management Act

ACRONYMS AND ABBREVIATIONS (CONTINUED)

SMP	Shoreline Master Program
TMDL	total maximum daily load
UGA	Urban Growth Area
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington Department of National Resources
WRIA	Water Resource Inventory Area
WSDOT	Washington State Department of Transportation

1. INTRODUCTION

1.1 PURPOSE

The City of Bremerton (City) is conducting a comprehensive Shoreline Master Program (SMP) update with the assistance of a grant administered by the Washington State Department of Ecology (Ecology) (Shoreline Master Act [SMA] Grant No. G1000007). Cities and counties are required to update their SMPs to be consistent with the state SMA, Revised Code of Washington (RCW) 90.58 and its implementing guidelines, the Shoreline Management Guidelines, Washington Administrative Code (WAC) 173-26.

Washington's SMA was passed by the State Legislature in 1971 and adopted by the public in a referendum. The SMA was created in response to growing concerns about the effects of unplanned and unregulated development on the state's shoreline resources. The central goal of the SMA is 'to prevent the inherent harm in an uncoordinated and piecemeal development of the state's shorelines'.

The SMP Restoration Plan is intended to be coordinated with other existing plans in the area, and provide additional potential projects focused on opportunities identified in the SMP Inventory/Characterization and coordinated with SMP policies and regulations..

1.2 SMP RESTORATION PLAN GOALS

The goals of the Restoration Plan are

- Continue to work collaboratively with other jurisdictions and stakeholders in WRIA 15 to implement the Salmon Habitat Protection and Restoration Strategy.
- Use the scientific foundation and the identification of opportunities and constraints in the SMP Inventory/Characterization together with other watershed, fish, and flood control plans as a resource to identify restoration strategies and projects.
- Use the comprehensive list of projects and other actions consistent with the Salmon Habitat Protection and other programs as sources of potential site-specific projects.
- Coordinate land use decisions, particularly mitigation required of development projects, with the comprehensive list of project actions for coordinated implementation of the most effective restoration strategy.
- Encourage voluntary restoration by homeowners and other shoreline property owners, in addition to agency funded and project related actions as well as resource friendly daily actions such as vegetation selection and management, pesticide/herbicide use, car washing and other activities.
- Provide for management of City-owned parks and other facilities to provide for ecological restoration, along with recreation, flood control and other goals.
- Seek funding for restoration actions and programs from a variety of sources and by working with other WRIA 15 stakeholders to seek federal, state, grant and other funding opportunities.

1.3 ROLE OF RESTORATION IN THE SMP UPDATE

The City of Bremerton's Shoreline Master Program (SMP) applies to activities and uses within its area of Shoreline Management Act (SMA) jurisdiction. Activities which produce adverse impacts on shoreline ecological functions must have mitigation for those impacts to

assure no net loss of shoreline ecological functions. By law, development within the area of SMA jurisdiction is not required to improve the affected shoreline beyond the baseline condition at the time the activity takes place. How then can shoreline ecological functions be improved over time in areas where the baseline condition is marginally, or even severely, degraded?

Section 173-26-201(2)(f) of the Washington Administrative Code (WAC) she Shoreline Management Guidelines addresses restoration with the following:

> Master programs shall include goals and policies that provide for restoration of such impaired ecological functions. These master program provisions shall identify existing policies and programs that contribute to planned restoration goals and identify any additional policies and programs that local government will implement to achieve its goals. These master program elements regarding restoration should make real and meaningful use of established or funded non-regulatory policies and programs that contribute to restoration of ecological functions, and should appropriately consider the direct or indirect effects of other regulatory or non-regulatory programs under other local, state, and federal laws, as well as any restoration effects that may flow indirectly from shoreline development regulations and mitigation standards.

Degraded shorelines are not exclusively a result of pre-SMP activities, but also of unregulated activities and exempt development. The new Guidelines also require that, "Local master programs shall include regulations ensuring that exempt development in the aggregate will not cause a net loss of ecological functions of the shoreline" (173-26-186(8)(b)(ii) WAC). While some actions within shoreline jurisdiction are exempt from a permit, the SMP should hold that permit exempt developments must still comply with the Shoreline Management Act (SMA) or the local SMP.

Because the shoreline environment is also affected by activities taking place outside of a specific local master program's jurisdiction (e.g., shoreline areas upstream of the City and otherwise outside of City limits), assembly of interlocal agreements, forums, programs, and policies can be essential for understanding how the City fits into the larger watershed framework. Watershed-wide goals and objectives are critical for the improvement of highly interconnected regional environments.

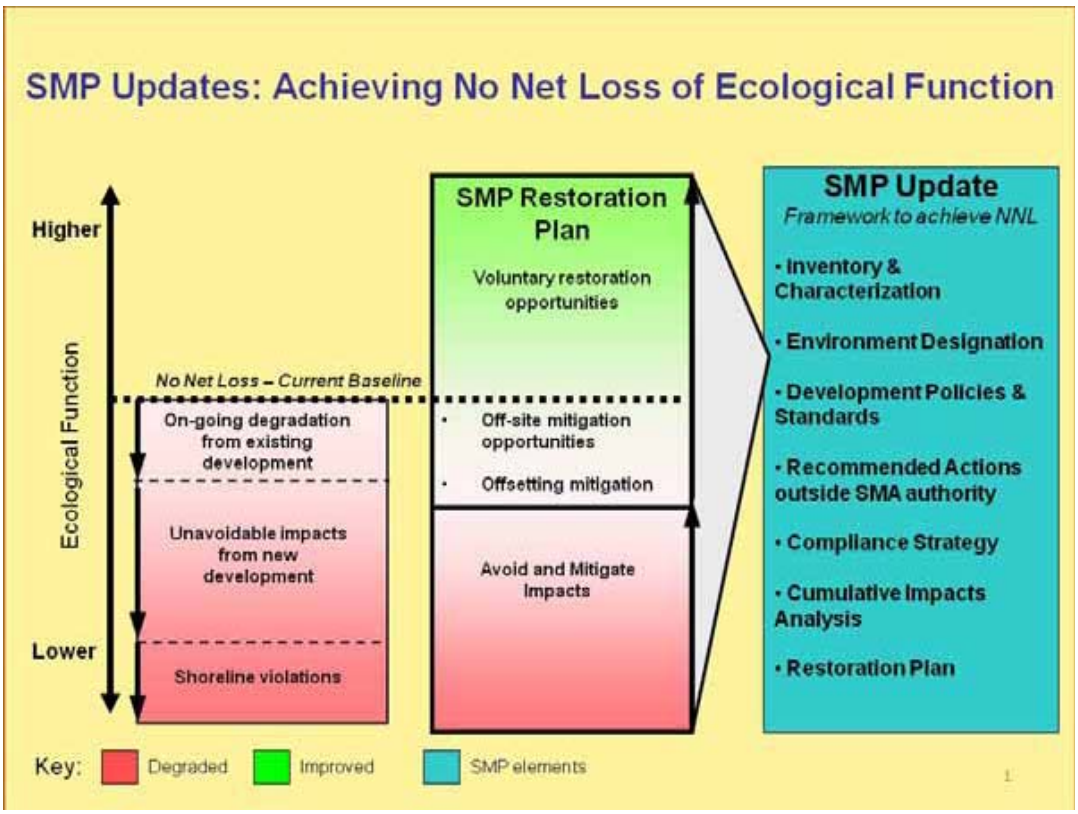
As indicated by the Guidelines, the following discussion provides a summary of existing or baseline shoreline conditions, lists restoration objectives both regionally and locally, evaluates ongoing programs and restoration projects, provides potential restoration opportunities within the City of Bremerton, and sets standards and goals for implementation and monitoring. Careful adherence to the Restoration Plan will allow the City to maintain and begin restoring ecological functions to shorelines, thus meeting SMP Guidelines.

This Restoration Plan is also intended to support grant funding of restoration projects by the City and/or non-governmental organizations. Additionally, it can provide resources for public and/or non-governmental organizations interested in engaging in restoration activities with the City.

Both regulatory programs, and non-regulatory programs such as voluntary restoration activities, contribute to environmental protections. Generally speaking, however, regulatory programs are designed simply to achieve no net loss of ecological functions. Restoration activities undertaken by the public, private, and non-profit organizations are expected to provide the primary source of improvements to ecological functions. Many of the restoration opportunities noted in this plan affect private property. This plan does not require restoration on private property or to commit privately owned land for restoration purposes without the

willing cooperation and participation of the affected landowners. In addition, private landowners who are required to provide mitigation for development related impacts may wish to implement actions noted in this plan to meet their mitigation obligations on their own land or make arrangement with others to purchase rights for off-site mitigation.

The difference between the role of regulatory and non-regulatory programs in achieving no net loss and restoration of ecological functions is illustrated below in Figure 1-1.



Source: Washington Department of Ecology

Figure 1-1. Role of the Restoration Plan in the SMP Update

1.4 ELEMENTS OF RESTORATION

WAC 173-26-020(27) defines Restoration as "the reestablishment or upgrading of impaired ecological shoreline processes or functions. This may be accomplished through measures including, but not limited to, revegetation, removal of intrusive shoreline structures and removal or treatment of toxic materials. Restoration does not imply a requirement for returning the shoreline area to aboriginal or pre-European settlement conditions".

The guidelines require that "provisions should be designed to achieve overall improvements in shoreline ecological functions over time, when compared to the status upon adoption of the master program". These definitions emphasize the repair of past damage to natural resources and habitats, but not necessarily re-creating pristine or historic conditions. In addition, addressing the ecosystem processes and functions- not simply recreating the habitat or structure- is important for successful restoration.

Therefore, this Plan emphasizes restoring impaired processes and protecting those which are currently functioning. Restoration tends to go beyond following regulations, to taking steps to improve the existing conditions and resources of the shoreline.

Restoration may be non-regulatory, voluntary, and undertaken by public agencies, environmental stewardship groups, or local governments often in partnership with private landowners.

The same actions may also be undertaken as mitigation required as part of permit approval to achieve the no net loss of ecological functions standard for new development on she shoreline.

There are a number of potential strategies for restoration:

Protection and Preservation is achieved in the SMP through:

- Shoreline Environment Designations have identified the shorelines which retain their ecological functions as Natural or Urban Conservancy. The policies and development standards for those designations provide increased protection of those existing processes and functions.
- Performance standards for mitigation in SMP 20.16.xx provide for protection and preservation as the first priority in mitigation of any adverse impacts.

Restoration and Mitigation is achieved through

- Policies and development standards applied to individual, permitted project.
- Mitigation, which is typically a required sequence of actions to offset impacts on ecological functions by taking steps to avoid and minimize project impacts prior to compensating for unavoidable losses.
- In the case of compensatory mitigation, restoration projects are generally a component.

1.5 RESTORATION AND NO NET LOSS

WAC 173-26-186(8) directs Shoreline Master Programs to "include policies and regulations designed to achieve no net loss of those ecological functions". No net loss (NNL) means that, over time, the existing condition of the shoreline ecological functions should remain the same as they were when the SMP update was adopted. The major component in achieving NNL is through regulatory compliance.

Restoration planning is a separate mandate which involves improving ecological conditions and is designed to correct and compensate for past actions that have led to current levels of environmental degradation. Restoration is also needed to compensate for on-going degradation from existing development or past actions.

2. BACKGROUND

2.1 PLANNING AREA

The City of Bremerton is located on the western side of Puget Sound, in the central portion of Kitsap County, about 15 miles west of Seattle as indicated in Figure 2-1 . Jurisdictional shorelines in the City lie within Water Resource Inventory Area [WRIA] 15, which encompasses all of Kitsap County and portions of Mason, Pierce, and King Counties (Vashon Island). Bremerton is located in the eastern portion of WRIA 15, or the East Kitsap Watershed, and most of the area is comprised of numerous small drainages flowing directly into Puget Sound. The study area for freshwater shorelines includes drainage areas or sub-basins for the major streams and lakes, such as Gorst Creek, Kitsap Lake, and the Union Reservoir as indicated in Figure 2-1. Portions of the study area to the west and southwest of Gorst drain into the Union River and ultimately into Hood Canal.

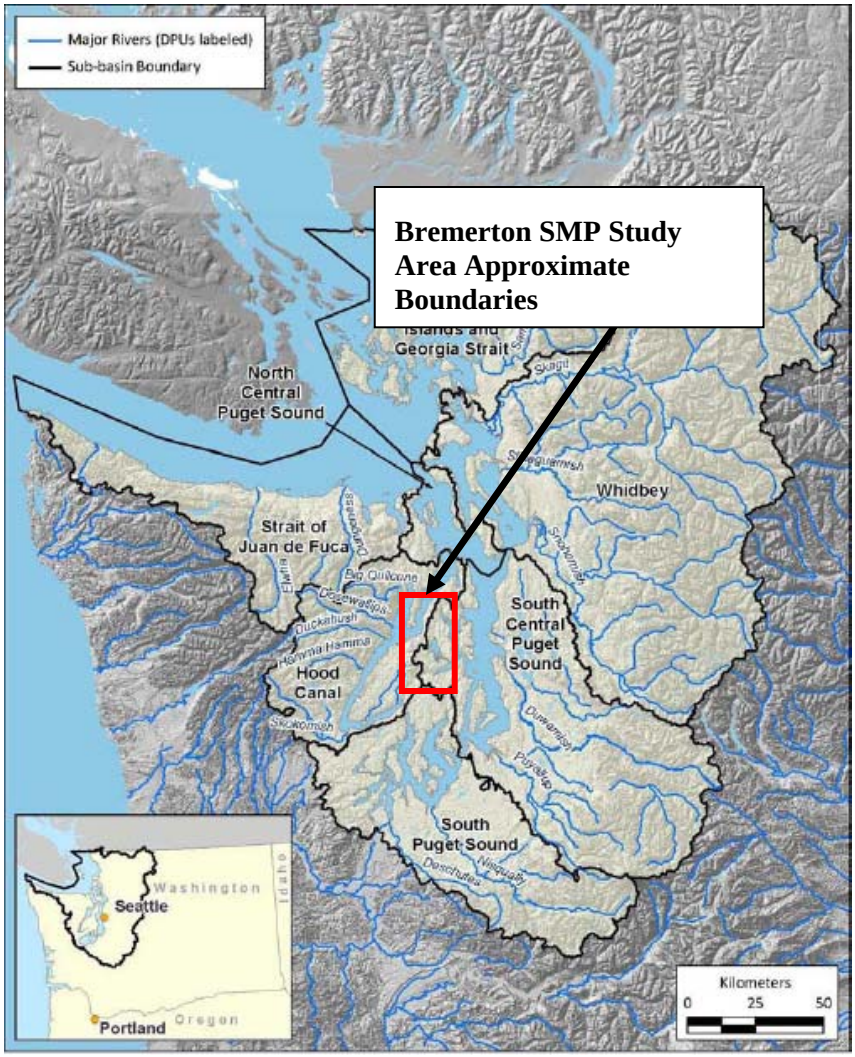


Figure 2-1. Puget Sound Context of Bremerton shorelines.

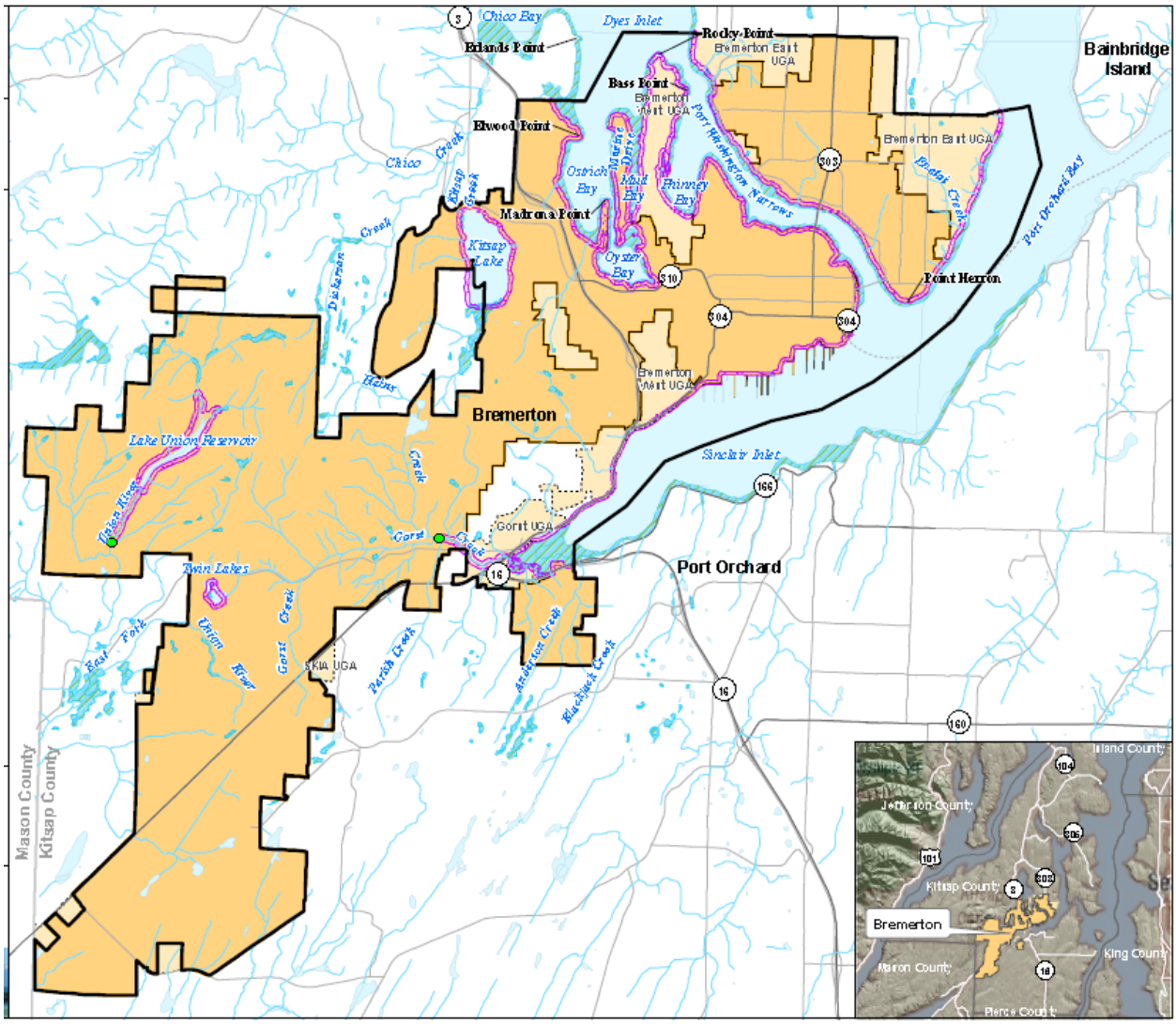


Figure 2-2. Study area for the ecosystem characterization of Bremerton shorelines.

The marine waters of Puget Sound have been divided into sub-basins based on geography, oceanographic conditions (circulation, bathymetry, wave exposure), and common socio-economic issues and interests. Sub-basins, however, are classified somewhat differently by different studies. For this ecosystem-wide characterization, the study area for marine shorelines encompasses Dyes and Sinclair Inlets, as well as the Port Washington Narrows, which connects Dyes and Sinclair Inlets, and a portion of Port Orchard Bay north of Sinclair Inlet.

Table 2-1. City of Bremerton Shoreline Planning Area

Shoreline Water Body	Reach Numbers[1]	East Kitsap Inventory Unit ID Numbers	General Description	Approximate Size in acres[a] (Shoreline Length in feet)	Approximate Percentage of City's Shoreline (including PAA)
FRESHWATER SHORELINES					
Kitsap Lake	All	NA	Entire Lake	548 (14,000)	2
Twin Lakes	All	NA	Twin Lakes shoreline.	17 (3,800)	<1
Union Reservoir	All	NA	Entire Union Reservoir shoreline.	64 (14,000)	2
Union River	All	NA	Reach of the Union River downstream of the reservoir to McKenna Falls.	17 (3,800)	<1
Lower Gorst Creek	All	NA	Reach of Gorst Creek upstream of the estuary to point upstream where flows are below 20 cfs (within shoreline jurisdiction).	24 (5,250)	<1
MARINE SHORELINES					
Dyes Inlet					
Chico Bay		430, 431, 432, 433, 434	Chico Bay	188 (9,758)	In study area but outside City & PAA
Ostrich Bay Erlands Point	51, 89, 52, 53	424, 426, 427, 428, 429,	From embayment to Erland's Point and into east side of Chico Bay	211 (7,270)	Erlands Point
Ostrich Bay East	ALL	416, 417, 419, 420, 421, 422, 423[2]	Western shore of Ostrich Bay to embayment north of Elwood Point	242 (11,766)	6
Ostrich Bay Marine Drive	87	391, 392, 393, 394	Marine Drive Peninsula	113 (6,473)	4
Ostrich Bay Marine Drive North	86, 44	386, 387, 388, 389	Tip of Marine Drive peninsula (between Mud Bay and Ostrich Bay)	99 (4,156)	2
Ostrich Bay Marine Drive	87	391, 392, 393, 394	Marine Drive Peninsula	113 (6,473)	4
Oyster Bay	ALL	396, 399, 400, 401, 403, 408, 409, 411, 412, 413, 414	Inner portion of Oyster Bay to small peninsula separating Oyster Bay from Ostrich Bay	227 (14,725)	8
Mud Bay	42, 43	380, 382, 383, 385	Mud Bay	86 (7,385)	4
Sinclair Inlet					
Blackjack Creek	Blackjack Creek	Blackjack Creek	Blackjack Creek	Blackjack Creek	Blackjack Creek

[1] Reach numbers for marine shorelines correspond to drift cell numbers used in the East Kitsap County Nearshore Habitat Assessment.

[2] Northern limit of planning area.

Shoreline Water Body	Reach Numbers[1]	East Kitsap Inventory Unit ID Numbers	General Description	Approximate Size in acres[a] (Shoreline Length in feet)	Approximate Percentage of City's Shoreline (including PAA)
Gorst Estuary	Gorst Estuary	Gorst Estuary	Gorst Estuary	Gorst Estuary	Gorst Estuary
Puget Sound Naval Shipyard (PSNS)	Puget Sound Naval Shipyard (PSNS)	Puget Sound Naval Shipyard (PSNS)	Puget Sound Naval Shipyard (PSNS)	Puget Sound Naval Shipyard (PSNS)	Puget Sound Naval Shipyard (PSNS)
Phinney Bay	Phinney Bay	Phinney Bay	Phinney Bay	Phinney Bay	Phinney Bay
Port Washington Narrows					
Port Washington Narrows West	35, 149, 151, 150, 36	351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 509	West side of Port Washington Narrows, Bremerton Waterfront to Phinney Bay	315 (14,263)	8
Port Washington Narrows Phinney Bay	37, 38, 85, 39	365, 366, 367, 368, 369, 370, 371, 372	Phinney Bay	266 (14,889)	8
Port Washington Narrows East	137, 108, 135, 107	459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 470[3], 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 228	Windy Point to Point Herron on east shore of Port Washington Narrows	634 (29,250)	11
Port Orchard Bay, Point Herron	55, 56A	229, 230	Point Herron to current city limits	140 (4,388)	2
Port Orchard Bay	56B	231, 232, 507, 233, 234, 235[4], 236, 237, 239, 240	Shorelines along Bremerton side of Port Orchard Bay	247 (8704)	5
Sinclair Inlet					
Downtown Bremerton	35	200, 202, 203, 502, 204, 504, 205, 503	South side of Sinclair Inlet east of Puget Sound Naval Shipyard	303 (14,752)	In study area but outside City & PAA
Puget	34A	221, 222,	Puget Sound Naval	383	18

[3] Start of planning area limit.

[4] End of planning area limit.

Shoreline Water Body	Reach Numbers[1]	East Kitsap Inventory Unit ID Numbers	General Description	Approximate Size in acres[a] (Shoreline Length in feet)	Approximate Percentage of City's Shoreline (including PAA)
Sound Naval Shipyard (PSNS)		223, 224, 225	Shipyard	(32,914)	
Gorst Estuary	34B	206, 505, 207, 208, 209[5], 210, 211, 212, 213, 506, 214, 215, 216, 217, 218, 219, 220	Sinclair Inlet Gorst Estuary to the PSNS	605 (28,605)	16
Blackjack Creek	34C	200, 202, 203, 502, 204, 504, 205, 503	South side of Sinclair Inlet east of Gorst	303 (14,752)	In study area but outside City & PAA

a Nearshore areas based on assessment units defined in the East Kitsap Nearshore Habitat Assessment and is larger than the area within shoreline jurisdiction; freshwater area Includes floodways, and floodplains within 200 feet of floodways based on existing mapping sources.

2.2 PLANNING AREA CHARACTERISTICS

The following is a summary from the SMP Inventory and Analysis. Please refer to that document for additional details.

Climate: Bremerton's climate is influenced by the temperate maritime patterns that define the overall climate of the Puget Sound lowlands (Mass 2009). In general, the climate is characterized by mild, wet winters, and warm, dry summers.

Precipitation is strongly seasonal, with about two thirds of the rain falling between November and March. Precipitation typically occurs as frequent, low-intensity, and long-duration storms. Annual precipitation in the Puget Sound Lowlands typically ranges from 32 to 37 inches. Bremerton precipitation averages about 39 inches per year, with higher precipitation (about 50 inches per year) falling at Green Mountain (Haring 2000). Snow is rare at the relatively low elevations within the study area.

Geology: The East Kitsap Watershed is geologically and topographically similar to other areas in the Puget Sound region, reflecting the influences of mountain building and glacial activity. During the Eocene Epoch (approximately 38-55 million years ago), the East Kitsap Watershed was located at the western edge of the North American continent. Sediments were deposited in the coastal environment to the west of North America.

The Pleistocene Epoch (or Ice Age), which began about 2 million years ago, formed most of the geologic features present in the watershed today. Cordilleran Ice Sheets, which originated in the coast and insular mountains of British Columbia, moved south to the southern end of the Puget Sound basin near Olympia. Up to 3,500 feet of glacial ice covered the Kitsap Peninsula. Geologic units from at least five major and several minor glacial advances have been identified in the Puget Sound basin, although only three are exposed (visible) in Kitsap County.

[5] Approximate eastern limit of planning area; just to west of Anderson Creek.

Surface geology in the study area is a complex mix of glacial deposits, which include unconsolidated silts, sands and gravels and typically cover a hardpan lying just below the surface. In the study area watersheds (Chico Creek, Gorst Creek, Union River), bedrock underlies the upper sections of watershed tributaries whereas the lower areas are underlain by glacial till, recessional outwash, and advance outwash deposited during the last ice-sheet advance. Following the final retreat of the Fraser Glaciation, more recent alluvial deposits from weathering, erosion and sedimentation have continued to shape the landscape (Sossa 2003). Bluffs along the Puget Sound are being eroded and re-deposited as beaches and spits. Streams are eroding their banks and then depositing sediments in floodplains, wetlands, and bays. Soils in the region were formed from the complex deposits of the most recent glaciation and are relatively young.

Seismic Activity: The Puget Sound region as a whole is in an area of active plate tectonics and seismic activity. Puget Sound is part of the Cascadia subduction zone, where the Juan de Fuca plate is moving under the North American plate. Several fault lines cross Puget Sound and are associated with seismic activity. Movement along the quaternary fault lines that cross Bremerton or other seismic events could cause liquefaction of the relatively loose soils that are commonly present along river and stream channels, lakes, and stream deltas and some marine shorelines. Soil liquefaction is a phenomenon in which pore pressure in loose, saturated, granular soils increases during ground shaking resulting in a reduction of shear strength of the soil (a quicksand-like condition).

Topography, Bathymetry, Geomorphology: Most of the upland and freshwater portions of the study area consist of low, rolling hills with moderate slopes. Higher areas occur in the upper watershed of Sinclair Inlet to the west of Bremerton with some steep slopes (>50% slopes). The highest point is Green Mountain at about 1,500 feet. The most dramatic feature of the study area is the long marine shoreline of Puget Sound, formed by several inlets and many smaller bays.

Puget Sound itself is a large, fjord-like estuary where freshwater from numerous rivers mixes with saltwater from the Pacific Ocean. The Sound contains many sub-estuaries where larger rivers and small streams enter the Sound and create a mix of tidal freshwater, brackish, and salt marsh wetlands. As is typical of fjord-like estuaries elsewhere, Puget Sound is characterized by relatively deep basins that drop off steeply from a narrow fringe of shallow nearshore areas adjacent to the shoreline. Most of the Puget Sound shoreline in the study area has moderate to low banks, or areas with no appreciable bank – bays and estuaries, although higher, steep sloping bluffs occur along Port Washington Narrows.

Major upland and freshwater landforms in the study area include (Montgomery and Buffington 1998, Buffington et al. 2003)

- rolling uplands;
- stream valleys with typical pool-riffle morphology, channel migration zones, and small floodplains;
- wetlands in topographic depressions, on lakeshores, and on slopes; and
- lakes with deeper open water and shallow littoral zones.

Hydrology: The East Kitsap Watershed lies between the backbones of the Kitsap Peninsula and Bainbridge Island, resulting in a narrow strip of land with many short streams that drain to the west side of Central Puget Sound. Streams in the study area are typical lowland type streams with generally moderate gradients. Upper reaches of streams are typical Puget Lowland headwater streams with low gradients that originate with perched groundwater in lakes and wetlands on upland plateaus and hills. Numerous wetlands occur in the study area. Considerable deciduous growth, interspersed with stands of conifers, farmland, and

urban/suburban development is common on all streams. None of the streams are supported by snow runoff, as the maximum elevation in East Kitsap is less than 500 meters.

Stream power is generally low, limiting the ability of streams to transport sediment. Where streams flow off the higher rolling hills and plateaus down to the shore of the Sound, steeper ravines can create confined channels with greater sediment transport capacity Due to the small size of most streams, large, extensive floodplains are not found in the study area. Water can be transported to storage areas via hyporheic (i.e., flow through streambeds and soils near stream channels) and overbank flow.

Alternatively, precipitation can infiltrate the soil to recharge groundwater. Water is lost by flowing out of the watershed into the adjacent watershed or marine waters, and through evapotranspiration. Water directly evaporates from the surface of lakes and marine waters. Plants pull water up from the soil through their roots and transpire large amounts of water vapor back into the atmosphere during photosynthesis.

3. IDENTIFICATION OF SITES AND PROGRAMS WITH RESTORATION POTENTIAL

In general, emphasis for protection and restoration depends on land-use and the degree to which the area supports ecosystem-wide processes (Figure 3-1). The two criteria for rating functions result in three general categories:

Areas with the highest priority for protection and preservation are the areas with a moderate to high importance for processes and moderate to low levels of alteration which have the highest priority to allow the processes to continue with minimal change in existing conditions.

Areas for restoration may have a range of importance for processes and a range of alteration. Figure 3-1 indicates that priority is generally based on the importance of the process, rather than the extent of alteration. Some areas of high alteration may have high potential for restoration if the affected processes are important.

Areas with low importance for processes and high levels of alteration generally are those areas with the greatest suitability for development for human use, which generally entails loss of ecological processes.

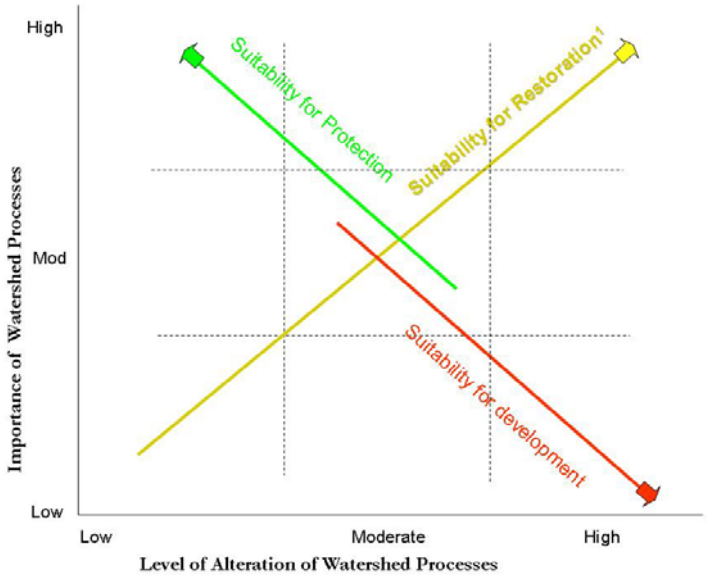


Figure 3-1. Rating of Priority Areas for Process-based Protection and Restoration

The following are resources which have been used for identifying restoration opportunities in this report, and which may be used to identify and prioritize future restoration projects.

3.1 MARINE PROJECT REFERENCES

Primary sources which could be used to identify degraded areas and areas with restoration /protection potential for the marine and estuarine shoreline include:

- *East Kitsap County Nearshore Habitat Assessment and Restoration Prioritization Framework and West Kitsap Addendum (Battelle, 2009).* Nearshore Assessment Units (sub-drift cell units of shoreline) were scored as being best suited for Protection, Restoration, Enhancement, Creation or Restoration of site processes, depending on the likelihood of success based on current ecosystem processes and functions.
- *Priority Habitats and Species (Washington Dept. of Fish and Wildlife).* This dataset is updated periodically to identify where important and unique habitats are located and where species of federal, state and local importance may be found. These areas should be restored and protected to the greatest extent feasible.
- *Priority Shoreline Conservation Areas, Kitsap Alternative Futures (2011).* Bin 1 (top 20% of Kitsap shoreline) is the most ecologically intact or important and is a compilation of regional assessments, PHS data, Nearshore Assessment scores, and other local studies. These areas should be restored and protected to the greatest extent feasible.
- *Habitat Work Schedule.* Online database, organized according to Lead Entity Region (West Sound and Hood Canal) which includes identified, proposed, and ongoing restoration and protection projects. Projects seeking salmon restoration funds will often first need to be identified in HWS. Projects on the Lead Entity's state-mandated Three-Year Work Plan, which are reviewed and scored by a Technical Advisory Group, are also listed in HWS.
- *Kitsap County Transportation Improvement Plan / Stormwater Improvement Plans.* These annually updated improvement plans identify and prioritize projects such

as replacement or repair of undersized or fish-passage barrier culverts, where to implement LID retrofits or restoration of floodplains for storage and habitat improvements.

3.2 FRESHWATER PROJECT REFERENCES

Primary sources which could be used to identify degrades areas and areas with restoration /protection potential for the freshwater shoreline include:

- *PSNERP Puget Sound Watershed Characterization Project: Water Flow Processes* (Dept. of Ecology, 2010). This assessment produces a "watershed management" map showing where protection and restoration actions are more likely to succeed and will most benefit the water flow processes of the watershed. Habitat and other scored elements to follow.
- *Priority Habitats and Species (WDFW).* This dataset is updated periodically to identify where important and unique habitats are located and where species of federal, state and local importance may be found. These areas should be restored and protected to the greatest extent feasible.
- *Habitat Limiting Factors Analyses* (Harring, 2000 and Kuttel, 2003). These reports, done for each Water Resource Inventory Area (WRIA), identified the current riparian conditions, health, biological attributes and the factors which are limiting the proper functioning of each mapped stream.
- *Habitat Work Schedule.* Online database, organized according to Lead Entity Region (West Sound and Hood Canal) which includes identified, proposed, and ongoing restoration and protection projects. Projects seeking salmon restoration funds will often need to be identified in HWS. Projects on the Lead Entity's mandatory Three-Year Work Plan, which are reviewed and scored by a Technical Advisory Group, are also listed in HWS.
- *Kitsap County Transportation Improvement Plan(TIP) / Stormwater Improvement Plan(SIP).* These annually updated improvement plans identify and prioritize items such as replacement or repair of undersized or fish-passage barrier culverts, where to implement LID retrofits or restoration of floodplains for storage and habitat improvements.

3.3 IDENTIFIED RESTORATION AND PROTECTION PROJECTS

The tables below list specific restoration and protection projects which have been identified in one of the above resources within the Bremerton SMP or within water bodies that would contribute to overall ecologic functions in Dyes Inlet, Port Washington Narrows, Sinclair Inlet, Port Orchard Bay and related water bodies, including upstream watersheds. The tables identify the general location, the primary impacted processes, functions or species, a description of the specific identified project(s) addressing those impacts, and finally the current plan for that project.

The marine and estuarine projects are a subset of projects identified on a WRIA 15 basis that relate to water bodies within or affected by Bremerton Shorelines. Chapter 5 goes into greater detail in identifying restoration strategies within specific watersheds and reach areas in Bremerton.

Table 3-1 Marine and Estuarine Shoreline Projects

Project Location	Impacted Process/Function/Species	Project Description	Status / Priority
Chico Bay (Drift Cell 90)	Tidal Erosion and fluvial deposition impacted by pilings, armoring and groins; Chinook, chum, coho, steelhead	Remove bulkhead at "Place of Salmon" park; remove invasive/re-establish native vegetation; Kittyhawk Rd. abandonment and culvert removal; estuary acquisitions	Kittyhawk Dr., 2012; Enhance
Anna Smith Park (Drift Cell 137)	Sediment source and transport impacted by pilings and armoring	Remove bulkhead, restore shoreline and access	Parks ; Enhance, Create and Restore site process
Mosher Creek (Drift Cell 137)	Fluvial deposition	Replace/remove culvert at Mosher Creek crossing	Not planned; Enhance
Gorst Estuary (Drift Cell 34)	Tidal erosion, fluvial deposition, sediment transport, water quality; forage fish, chinook, chum, coho, steelhead, waterfowl/shorebirds, shellfish	Acquisitions/easements	Enhance, Create and Restore site process
Retsil (Drift Cell 34) Sinclair Inlet	Wave deposition impacted by pilings, armoring and marinas; water quality; chum, coho, surf smelt, sand lance	Replace undersized culvert; restore natural shoreline processes near boat ramp	Enhance, Create and Restore site process
Beach Drive (Drift Cell 84) Sinclair Inlet	Fluvial Deposition (NAU 486) impacted by armoring ; Wave Deposition/Energy (NAU 188) impacted by armoring, pilings; chum, coho, surf smelt, sand lance, waterfowl concentrations	Replace culvert at Sacco Lane.; fix Waterman dock and restore shoreline; evaluate culvert size at Waterman Point	Conserve, Restore and Restore site process
Illahee (Drift Cell 56)	Fluvial and wave deposition; Critical Aquifer Recharge;	Protect remaining salt marsh; Implement Illahee regional stormwater treatment facility	Stormwater, 2016; Enhance
Illahee State Park/ Enetai (Drift Cell 56)	Sediment source and transport impacted by pilings and armoring	Investigate soft-bank armoring alternatives	Not planned; Create and Restore site process
Illahee (Drift Cell 56)	Fluvial and wave deposition; Critical Aquifer Recharge;	Protect remaining salt marsh; Implement regional stormwater treatment facility	Stormwater, 2016; Enhance

The freshwater projects below are a subset of projects identified on a WRIA 15 basis that relate to water bodies within or affected by Bremerton Shorelines. Many of these projects relate to marine water bodies because freshwater inputs are a critical element of marine

ecology. Chapter 5 goes into greater detail in identifying restoration strategies within Bremerton.

Table 3-2 Freshwater Shoreline/Watershed Projects

Project Location	Impacted Process/Function/ Species	Project Description	Status / Priority
Lower Chico Creek	High impairment of surface water storage, groundwater recharge and discharge; culverts are velocity barriers ; weirs are low flow barriers	- Implement LID - Replace culverts at Kittyhawk Rd., SR 3 and Golf Club Hill Rd. -Remove DOT trash rack after bridges in place - Improve riparian and channel conditions, especially at Erlands Point Park - Continue creating off-channel habitat for salmonid rearing and nesting; - Implement other recommendations of the Chico Creek Alternative Futures Plan (Including at Time Oil site) - Continue to monitor and remove knotweed and other invasive plants	
Upper Chico Creek and Wetland		-Protect existing functions; -Assess impacts of Seabeck Hwy culverts and replace where needed - Decommission trails in sensitive areas at Newberry Heritage Park; add or improve other trails -Remove invasive plants/replant appropriate wetland shrubs or trees	
Kitsap Lake and Wetland		Implement LID retrofits	
Union River		-Maintain riparian forest buffers and improve LWD abundance -Reestablish natural cover -Retrofit existing structures with permeable pavement and rain gardens	

3.4 PROGRAMMATIC RESTORATION ACTIONS

Certain restoration actions should be broadly and comprehensively implemented on a programmatic basis to help achieve restoration goals. The following programmatic actions are recommended for shorelines within Kitsap County as funding permits. Which entities will take the lead on these actions will be determined in the future. Kitsap County and its current and potential partners will continue to coordinate with each other on restoration activities. The funding mechanism for many of these actions has not yet been identified.

Education and Incentives

- Continue to educate shoreline property owners about shoreline processes, alternatives to armoring, benefits of native plants, etc. through various methods, including workshops, newsletters, websites and Beach Watchers / Stream Stewards classes.
- Identify feeder bluff locations and prioritize outreach on bulkhead removal or alternatives; provide support and incentives such as faster permitting or cost-shares.
-

Planning

- Develop and implement a planning-by-watershed approach, incorporating land use, low impact development, restoration, protection and public access.
- Utilize the Kitsap Alternative Futures model to support decisions on code modifications, policy, and prioritization of protection / restoration and development locations.
-

Infrastructure

- Continue to identify and replace undersized culverts or bridges for the passage of 100 yr. flood events, fish and wildlife and nutrients, including large woody debris of the average size tree from that watershed.
- Continue to identify and conduct Low Impact Development Stormwater Retrofits.
- Remove and restore locations with state identified leaking underground storage tanks, etc.

4. EXISTING PROGRAMS AND FUNDING SOURCES

4.1 GOVERNMENT AND NGO PROGRAMS

There are many existing government and private Non-governmental organizations (NGO) programs and funding sources which implement the Restoration and Enhancement goals and policies of this SMP update. Most restoration efforts are implemented because citizens, tribes, non-government entities and local, state and federal resource agencies collaborate to solve problems and achieve shared goals. Continued collaboration at all levels is needed if the goals of this plan are to be achieved.

Table 4-1 identifies Existing Governmental Restoration Programs. Table 4-2 identifies Private and NGO Restoration Programs. Table 4-3 identifies potential funding resources.

Table 4-1. Existing Governmental Restoration Programs

Organization and Program	Mission and Scope	Role in Future Restoration Efforts	Examples of Restoration Projects
Kitsap Co. Dept. of Community Development	• To enable the development of quality, affordable, structurally safe and environmentally sound communities. • Environmental Programs Division combines permit review with long range, environmental planning and restoration grant	• Grant administration • Planning and Prioritizing restoration and enhancement	• Chico Creek In-stream Restoration and Main-stem / estuary acquisitions • Kitsap Nearshore Assessment and Restoration Prioritization Framework

Organization and Program	Mission and Scope	Role in Future Restoration Efforts	Examples of Restoration Projects
	administration.		• Kitsap Regional Shoreline Restoration Demonstration Project
Kitsap Co. Health District (partial SSWM funds)	• Striving to make Kitsap County the healthiest place on the planet to live, work and play • Environmental Health Division: identifies and prioritizes clean-up of surface water (marine and fresh) • Pollution Identification and Correction (PIC) Program • Review of appropriate OSS placement • Stream, Lake, and Marine (shellfish) health monitoring and reports	• Coordinate restoration projects with PIC priority areas to enhance public awareness and participation	• Dyes Inlet Restoration Project • Other Pollution Identification and Correction (PIC) projects (Liberty Bay, Hood Canal, Yukon Harbor, etc.)
Kitsap Conservation District (partial SSWM funds)	• Farm Plans (BMPs) • Rain Garden Program • Backyard Habitat Grants (Stream and Shoreline restoration funds for communities)	• Coordinate Rain garden implementation with priority watersheds and projects • Prioritize habitat grants based on the priorities of this Report	
WSU Kitsap Extension	• Beach Watchers / Stream Stewards • Noxious Weed Control Program	• Provide outreach to shoreline property owners that is non-regulatory • Provide project monitoring • Provide technical support to landowners	
University of Washington Sea Grant	• Research and Education		• Geoduck aquaculture research • Public beach walks • State of the Oyster (shellfish sample analysis) • Educational materials
U.S. Navy	• ENVVEST		• U.S. Navy, Sinclair and Dyes Inlet studies to identify

Organization and Program	Mission and Scope	Role in Future Restoration Efforts	Examples of Restoration Projects
			and demonstrate alternative, long-term, cost-effective strategies for protecting these water-bodies
West Sound Watersheds Council (WSWC)	• East Kitsap Lead Entity for Salmon Recovery (WA State RCO) • 3 yr. Work Plan for Salmon Recovery		• Prioritizes state-funded salmon recovery and restoration projects carried out by other entities
Washington Department of Fish and Wildlife (WDFW)	• Habitat Work Schedule • Permitting	• Assist local jurisdictions in identifying local priority species • Provide technical assistance in project identification and prioritization	• Priority Habitats and Species (PHS) mapping and data collection • Conservation Plans
Washington Department of Ecology (DOE)	• Grants • Permitting • Washington Conservation Corps		
Suquamish Tribe	*It is the mission of the Suquamish Fisheries Department to preserve, protect and enhance treaty reserved resources within the Tribal usual and accustomed grounds and stations for subsistence, cultural and commercial benefits for present and future generations of Suquamish Tribal Members.*		• Project lead or team for projects on Dogfish, Gorst, Salmonberry, Barker, Chico, Carpenter and Cowling Creek
Port Gamble S'klallam Tribe	The HCCC prioritizes and disperses over $2 million dollars annually for salmon restoration across their planning area.		
Point No Point Treaty Council			• Riparian Vegetation Study (2010)
Point No Point Treaty Council			• Riparian Vegetation Study (2010)

Table 4-2. Private and NGO Restoration Programs

Organization and Program	Mission and Scope	Role in Future Restoration Efforts	Examples of Restoration Projects
Great Peninsula Conservancy	*The Conservancy works in partnership with landowners, community groups and local governments, providing the tools and expertise to enable landowners to preserve forever the special landscapes of the Great Peninsula region. The Conservancy conserves land through donations of conservation easements or gifts of land, or by purchase with donated funds, and counsels property owners on preservation techniques available to them.*	• Manage protection and restoration easements and acquisitions • Work with communities to identify restoration or protection projects in their neighborhood	• Stewardship of shoreline easements and owner of acquisitions, including Indianola Waterfront Preserve and Clear Creek Trail. • Conserved over 5700 acres of land
The Mountaineers	*the premier Northwest outdoor recreation club, dedicated to the responsible enjoyment and protection of natural places*	• Host classes and field trips for Stream Stewards or other workshops/training • Partner in future acquisitions in Chico watershed	• Preservation of thousands of acres of Chico Creek watershed • Education through Salmon Safari for youth, outdoor programs
Mid Sound Fisheries Enhancement Group			
Fish America Foundation	*The conservation and research foundation of the American Sportfishing Association—keeping our nation's fish and waters healthy* *FishAmerica provides grants to non-profits, conservation minded groups to enhance fish populations, restore fisheries habitat, improve water quality and advance fisheries research to improve sportfishing opportunities and success.*		
Wild Fish Conservancy			West Sound fish-typing surveys (North Kitsap)

Table 4-3. Potential Funding Sources

Agency	Grant or Fee Name
Washington State Recreation and Conservation Office / WDFW	Estuary and Salmon Restoration Program (ESRP) Grants
Washington State Recreation and Conservation Office	Salmon Recovery Funding Board Grants
Washington State Recreation and Conservation Office	Land and Water Conservation Fund (LWCF)
?	Washington Wildlife Recreation Program
National Fish And Wildlife Foundation	Community Salmon Fund Grants
WA Dept. of Fish and Wildlife	Aquatic Lands Enhancement Account (ALEA) Grants
WA Dept. of Natural Resources	Family Forest Fish Passage Program
Kitsap Conservation District/SSWM	Backyard Habitat Grants SSWM Fee
Washington Department of Ecology	Coastal Protection Fund / Terry Husseman Grants
Burley Lagoon Shellfish Protection District	Shellfish Protection District Fee
Kitsap County Public Works-Roads	Property Tax (~13% to Roads), and State Gas Tax
Environmental Protection Agency	Puget Sound Watershed Management Assistance Program

4.2 CITY OF BREMERTON PROGRAMS

Bremerton participates in West Sound Watersheds (East Kitsap) which covers the entire eastern portion of WRIA 15 and is the Lead Entity for Salmon Recovery

Other agencies involved in the project include Kitsap County departments, tribes, non-profit groups and the cities of Poulsbo, Bainbridge Island, Gig Harbor and Port Orchard. In addition, the City has a variety of programs by various departments that contribute to salmon recovery.

City programs relating restoration are administered by a variety of City departments.

Public Works and Utilities Department

Surface and Stormwater Management Program

This program includes a variety of efforts that aid restoration including:

- The City, along with regional partners, The Kitsap Peninsula Clean Runoff Collaborative (KPCRC) has a regional education and outreach program in addition to

providing education and focus on proper pet waste disposal, promotion of water quality hot lines, and promotion of the regional "Puget Sound Starts Here" campaign.

- The City participates in the Kitsap County Stormwater Management Advisory Committee. The committee consists of 18 members representing citizens, water related public agencies, tribal governments, and the four Kitsap County cities and advises on program direction and implementation, to address storm water control and quality issues, and to promote interagency and interjurisdictional coordination.
- The City has regulations and monitoring programs to prevent illegal discharge into the stormwater system.
- The City regulates stormwater in new development through adoption of the Stormwater Management Manual for Western Washington (SWMMWW), latest edition as the guiding criteria for the planning, design, and construction of stormwater facilities
- The City encourages low impact development through the Low Impact Development (LID) Guidance Manual - A Practical Guide to LID Implementation in Kitsap County as the guiding criteria for the planning, design, and construction of low impact development.
- The City reduces storm water impacts associated with runoff from streets through participating in the Regional Road Maintenance Endangered Species Act Program.
- The City addresses application of fertilizer, pesticides, and herbicides through nutrient management and integrated pest management plans for all parks and other facilities.

The City's Public Works and Utilities Forestry & Natural Resources Division manages 8,300 acres of Water Utility forest lands for watershed protection, timber harvest, reforestation, biosolids utilization and salmon restoration. The division also coordinates fishery and other environmental issues on Water Utility Forestlands and provides education such as an annual salmon viewing and Kid's Fishing Day.

Park and Recreation Department

The City's Parks, Recreation and Open Space Plan include specific a specific recommendation regarding the department's role in preservation and restoration of important natural areas:

> It is highly recommended that Bremerton identify potential natural area acquisitions and locate funding sources to help purchase additional natural area properties. Priority for natural land acquisitions may include undeveloped marine shoreline, second growth conifer forests (known habitat for eagles, osprey, great blue heron, harbor seals and harlequin ducks), parcels offering connectivity between protected upland habitat and bodies of water, and parcels that enlarge intact riparian buffer zones along of creeks and streams to increase water quality for salmon. This proactive stance will ensure that additional natural areas are preserved to accommodate or offset partial development at the existing undeveloped parks and that the current ratio of natural areas and undeveloped parkland acres to population is kept intact as the number of people residing in the City increases.

Other relevant policies of the plan include:

> Goal 3 Protect and manage the City's natural resources, scenic areas and environmentally-sensitive lands to highlight their unique attributes.
>
> 3.1 Identify and inventory the City's scenic, natural resource and environmentally-sensitive lands.

3.2 Develop a prioritized plan to protect and/or acquire the most valuable properties to provide access and passive recreation, as appropriate.

3.3 Manage vegetation in natural areas to enhance or maintain native plant species, habitat function and other ecological values. Remove and control nonnative or invasive plants as appropriate.

3.4 Develop management and restoration plans for significant community greenspaces and facilitate community-based volunteer restoration.

3.5 Develop forest management plans and contract with an arborist to improve the tree health in N.A.D., Forest Ridge, Sheridan, Stephenson Canyon, East Park and other forested parks.

Gorst Creek

A variety of programs have been implemented by the City in cooperation with other agencies for salmon recovery.

In 2001 the Gorst Creek Restoration Project replaced 750 feet of concrete channel with 1000 feet channel that replicates a more natural stream system and provides spawning, rearing and riparian habitat for salmonid species as well as other wildlife.

In 2010 the Comprehensive Watershed Plan for Sustainable Development and Restoration of the Gorst Creek Watershed was initiated with US Environmental Protection Agency grant funding as well as local funding and participation by Bremerton and Kitsap County, with assistance from Ecology, WDFW, the Kitsap County Health District, and other stakeholders.

The project consists of the following major tasks:

- Watershed Characterization Study and Comprehensive Watershed Plan,
- Land Use Plan and Development Regulations,
- Planned Action EIS,
- Stormwater Plan,
- Capital Improvement and Corrective Action Plan, including an EECA for correction of the Private Landfill within a major tributary of Gorst Creek, and
- Outreach and Information Transfer program.

The current study is expected to be completed in 2012.

5. RESTORATION PRIORITIES

The SMP Restoration Plan is intended to complement and not replace other plans such as salmon recovery plans.

This plan is also designed to be coordinated with efforts of other agencies through salmon recovery and other programs.

5.1 RESTORATION STRATEGY

The City's overall restoration strategy is to pursue restoration projects with multiple stakeholders that provide multiple benefits. Such programs have the greatest potential for cost effective and successful restoration of ecological functions.

The City should pursue the following opportunities:

- Pursue water quality and habitat restoration opportunities as part acquisitions and capital improvements for stormwater utility, transportation, parks and other projects.

- Manage City assets such as the Union River and Reservoir, City parks and other facilities for multiple uses, including restoration of ecologic functions where feasible.

- Cooperate with Kitsap County and other agencies in watershed based restoration programs in recognition that ecologic functions cross jurisdictional boundaries.

- Partner with others in WRIA 15 to coordinate salmon recovery actions with mitigation efforts by future development when such development is required to incorporate ecologic enhancement as part of non-water-dependent development or when development produces impacts that are most effectively addressed off-site.

- Make minor improvements to buffer area and vegetation as properties undergo remodeling and redevelopment to address ongoing adverse impacts, such as from runoff that carries herbicides and pesticides into water bodies.

5.2 RESTORATION STRATEGY BY WATER BODY

This section summarizes potential restoration strategies by the individual water bodies identified in the Shoreline Master Program Inventory and Analysis.

5.2.1 Dyes Inlet

Dyes Inlet is the marine embayment of west Puget Sound which includes the northerly portion of the Bremerton Urban Growth Area (UGA).

The Dyes Inlet watersheds drain an area of 30,289 acres, including the creeks that flow into the inlet. It has approximately 22 miles of marine shoreline and 90 stream miles that include ten named streams. Approximately 40% of the watershed is within the urban area (12,231 acres) designated by Kitsap County. Within the study area, about 16 miles of marine shoreline with contributing drainage areas occur in Dyes Inlet. Bremerton and Silverdale are the major urban areas, with smaller retail centers at Chico, Tracyton, and Kitsap Lake. The Jackson Park Navel Reservation, Camp Wesley Harris, and parts of the Bangor Naval Reservation are located within the watershed.

The Kitsap County Health District conducted the Dyes Inlet Restoration Project from 2005 to 2009 which addressed Fecal Coliform (FC) contamination which resulted in a substantial improvement in biological water quality due to identification and elimination of sources from on-site sewage disposal (OSS), sewer systems and stormwater. As a result of the program, the State Department of Health (DOH) reclassified Chico Bay from “restricted” to “conditionally approved” for commercial shellfish harvest due to water quality improvements.

Specific subareas considered in this plan include:

- Ostrich Bay (with several subareas)
- Oyster Bay
- Mud Bay

5.2.1.1 Ostrich Bay

Ostrich Bay is a large embayment in Dyes Inlet. It supports coho, chum, and cutthroat. A concentration of surf smelt spawning areas is mapped around Elwood Point. Patchy eelgrass

and salt marsh occur at a few scattered locations in Ostrich Bay. Bald eagle nests and foraging areas are associated with much of the Ostrich Bay shoreline

Land cover surrounding Ostrich Bay is a mix of high intensity residential, low intensity residential, mixed forest, evergreen and deciduous forest, urban grasses, and small areas of commercial/industrial. Land cover is mostly developed (66 to 80% developed) and impervious surface is relatively high; impervious surface is 30% or above over most of the contributing area.

Shoreline modifications include tidal barriers (3% of shoreline length), armoring (57% of shoreline area, roads (13% of shoreline area), and nearshore fill (2% of shoreline area). Overwater structures are concentrated in a few locations and cover less than 1% of shoreline area.

Water quality impairments include fecal coliform, mercury, and dissolved oxygen listings for 303(d) list Category 5. Most of Ostrich Bay is a Prohibited Shellfish Growing Area.

5.2.1.2 Ostrich Bay North

Ostrich Bay North includes the small embayment north of Elwood Point and the east and north side of Erlands Point, just into Chico Bay. The southern half of the embayment is the limit of the City's planning area, but the entire reach is described here.

Chico Creek is the most important source of freshwater inputs to this area, and the entire west and south portion of Ostrich Bay.

The predominant land use in the area is single-family residential. There is U.S. Navy and public ownership of the south side of the Chico Creek Estuary.

Restoration Strategy

Chico Creek and estuary restoration activities are likely to contribute to a number of processes relative to the marine environment, including freshwater inputs and sediment inputs. Efforts that directly affect the marine shoreline include the Chico Estuary Restoration Project including driveway and, roadway culvert removal, and channel restoration as well as future acquisitions and restoration in the estuary. Other restoration activities would include improvement of riparian conditions, especially at Erlands Point Park. Kitsap County is the lead agency for Chico Creek restoration.

Naval ownership of a large portion of this area provides the potential for enhancement of the marine nearshore and upland.

5.2.1.3 Ostrich Bay South

Ostrich Bay South includes the portion of the bay within the City. The primary land uses are the US Navy Hospital, the Navy Jackson Park residential community, the City's NAD Marine Park, and residential use.

Ostrich Bay Creek enters at the south end of the bay. It has a watershed area of about 450 acres in developed urban land uses. There is a pocket estuary at the delta of the stream. This stream supports coho, chum, and cutthroat. Fish passage barriers occur at Kitsap Way, SR 3, and Price Road. Fecal coliform bacteria levels in the stream have resulted in placement by the Kitsap Health District on a Public Advisory of waters that public should avoid contact with.

A seal and sea lion haulout area is mapped at Elwood Point A concentration of surf smelt spawning areas is mapped around Elwood Point. Patchy eelgrass and salt marsh occur at a few scattered locations in Ostrich Bay. Bald eagle nests and foraging areas are associated with much of the Ostrich Bay shoreline.

Land cover surrounding Ostrich Bay is a mix of high intensity residential, low intensity residential, mixed forest, evergreen and deciduous forest, urban grasses, and small areas of commercial/industrial. Land cover is mostly developed (66 to 80% developed) and impervious surface is relatively high; impervious surface is 30% or above over most of the contributing area. Shoreline modifications include tidal barriers (3% of shoreline length), armoring (57% of shoreline area, roads (13% of shoreline area), and nearshore fill (2% of shoreline area). Overwater structures are concentrated in a few locations and cover less than 1% of shoreline area. Water quality impairments include fecal coliform, mercury, and dissolved oxygen listings for 303(d) list Category 5 In addition, all of Ostrich Bay is a Prohibited Shellfish Growing Area.

Restoration Strategy

Chico Creek and estuary restoration activities are likely to contribute to a number of processes relative to the marine environment, including freshwater inputs and sediment inputs as the largest tributary on the west side of Dyes Inlet.

The City may contribute to water quality in the bay through incremental improvements in the storm drainage system and in public education that reduces discharge of nutrients and toxins into the system. This is especially the case for the tributary area of Oyster Bay Creek which has current bacterial and other contaminants.

Efforts that directly affect the marine shoreline include improvement of riparian conditions, especially at Erlands Point Park

Naval and City ownership of a large portion of this area provides the potential for enhancement of the marine nearshore and upland.

The City's NAD Marine Park is planned for largely passive use and will likely continue to provide a range of positive inputs to the nearshore.

Navy lands can be enhanced primarily by expansion of buffer areas and management to develop mature native vegetation along the marine frontage of the hospital, the park and the residential area. Removal or reduction in size of the inactive munitions pier would reduce impacts of over-water structures.

The developed primarily single-family area provides primarily lawn and ornamental vegetation at the shoreline with ongoing adverse impacts of discharge of runoff containing sediment, and toxins from pesticides and herbicides. Public education is likely the most effective means of changing existing practices.

The addition of native vegetation buffers adjacent to the water to provide filtering and uptake of pollutants and provide shading to reduce desiccation of the nearshore may be addressed by educational and voluntary planting of buffers. As individual properties undergo major remodeling or redevelop minimal buffers on the shoreline are required. Cumulatively these efforts are likely to benefit both water quality and nearshore habitat.

Existing docks and moorage facilities are limited, but will require enhancement to include grading for light penetration and less surface coverage as they reach the end of their useful life and require major repair or replacement.

The City may contribute to water quality in the bay through incremental improvements in the storm drainage system and in public education that reduces discharge of nutrients and toxins into the system. This is especially the case for the tributary area of Oyster Bay Creek which has current bacterial and other contaminants.

5.2.1.4 `East Ostrich Bay

East Ostrich Bay include Madrona Point, the Marine Drive Point and the westerly portion of Rocky Point above Mud Bay. Rocky Point is currently outside of the Bremerton city limits but in the UGA. This is a generally older residential area where most of the parcels were platted and developed prior to existing OSS regulations. The natural physical conditions of the area, primarily the surface and ground water conditions and the soil types and depths are not generally conducive for the utilization of "standard gravity" OSS. Development patterns along the shoreline and adjacent uplands include land cover is about 40 to 48% natural and 60 to 55% developed, with some mixed forest, deciduous forest, and urban grasses. Impervious surfaces are mostly below 30% in the contributing drainage.

Restoration Strategy

The developed single-family areas on Madrona Point and along Marine Drive provide primarily lawn and ornamental vegetation at the shoreline with ongoing adverse impacts of discharge of runoff containing sediment, and toxins from pesticides and herbicides. Public education is likely the most effective means of changing existing practices.

The addition of native vegetation buffers adjacent to the water to provide filtering and uptake of pollutants and provide shading to reduce desiccation of the nearshore may be addressed by educational and voluntary planting of buffers. As individual properties undergo major remodeling or redevelop minimal buffers on the shoreline are required. Cumulatively these efforts are likely to benefit both water quality and nearshore habitat.

Existing docks and moorage facilities are limited in number, but will require enhancement to include grading for light penetration and less surface coverage as they reach the end of their useful life and require major repair or replacement.

The City may contribute to water quality in the bay through incremental improvements in the storm drainage system and in public education that reduces discharge of nutrients and toxins into the system.

5.2.1.5 Oyster Bay

Oyster Bay is a shallow protected embayment with a relatively narrow opening to Ostrich Bay. Oyster Bay has no significant tributary streams. Most water is from runoff from a relatively narrow area surrounding the bay and from tidal flows. Oyster Bay has shallow habitat areas supporting high primary productivity and a diverse assemblage of benthic invertebrates and fish and provide potential for habitats, such as eelgrass. Oyster Bay as a low water exchange environment is particularly vulnerable to alterations that affect water quality including excess nutrients, pathogens, and toxins that tend to accumulate or have longer residence times due to limited flushing.

Water quality impairments include fecal coliform, mercury, and dissolved oxygen listings for 303(d) list Category 5. All of Oyster Bay is a Prohibited Shellfish Growing Area.

The majority of land in the bay is single-family residential with a small commercial area at the south end. Land cover is mostly developed (about 70% developed and 30% natural), with most of the contributing area with high levels of impervious surface (>50% impervious surface). The south shore of Oyster Bay has the highest level of development and impervious surface. Shoreline modifications include significant alteration to tidal action (11% of shoreline length with tidal barriers), moderate to high levels of armoring (50% of shoreline length), roads affecting the shoreline (13% of shoreline area), and relatively low levels of nearshore fill and overwater structures (less than 1% shoreline area).

Restoration Strategy

The commercial area near the south end of the bay has the potential for some restoration of the shoreline as part of future non-water-dependent development which requires shoreline restoration and public access. The existing development in this area is not water-dependent and it is doubtful that water dependent uses would be appropriate given the shallow nature of the bay and the proposed "Aquatic Conservancy" designation.

The developed primarily single-family area provides primarily lawn and ornamental vegetation at the shoreline with ongoing adverse impacts of discharge of runoff containing sediment, and toxins from pesticides and herbicides. Public education is likely the most effective means of changing existing practices.

The addition of native vegetation buffers adjacent to the water to provide filtering and uptake of pollutants and provide shading to reduce desiccation of the nearshore may be addressed by educational and voluntary planting of buffers. As individual properties undergo major remodeling or redevelop minimal buffers on the shoreline are required. Cumulatively these efforts are likely to benefit both water quality and nearshore habitat.

Existing docks and moorage facilities are limited, but will require enhancement to include grading for light penetration and less surface coverage as they reach the end of their useful life and require major repair or replacement. New over-water and in-water structures are limited by the proposed "Aquatic Conservancy" designation.

There is little public land in this reach and little opportunity for public enhancement projects on the shoreline.

Redevelopment of the 83-acre Bay Vista site (the Bremerton Housing Authority Westpark Community) is likely to result in improved water quality discharge to Oyster Bay through application of current stormwater management practices, although the redevelopment area is only a part of the tributary watershed draining into the bay.

The City may contribute to water quality in the bay through incremental improvements in the storm drainage system and in public education that reduces discharge of nutrients and toxins into the system.

5.2.1.6 Mud Bay

The east side of Mud Bay is currently outside of the Bremerton city limits but in the UGA. It is surrounded by relatively large residential lots.

Mud Bay completely empties at lower tides and supports a mud flat with high primary productivity contributing a diverse assemblage of benthic invertebrates to the food chain. It is a low water exchange environment that is particularly vulnerable to alterations that affect water quality including excess nutrients, pathogens, and toxins that tend to accumulate or have longer residence times due to limited flushing. Most parcels were platted and developed prior to existing OSS regulations. The natural physical conditions of the area, primarily the surface and ground water conditions and the soil types and depths are not generally conducive for the utilization of "standard gravity" OSS leading to potential high nutrient levels.

Land cover is about 40 to 50 % natural and 50 to 60% developed, with some mixed forest, deciduous forest, and urban grasses. The contributing drainage area is very limited. Shoreline modifications are limited, as one would expect in a low energy environment. a moderate to high amount of shoreline armoring (55% of shoreline length), some barriers to tidal flow (2% of shoreline length), and roads (8% shoreline area). In addition, numerous overhanging docks and piers, and pilings are scattered along the shoreline. However, this reach lacks large overwater structures and the low energy areas in Mud Bay are generally not

armored. Riparian vegetation is lacking for most of the shoreline, but areas along the eastern shore of Mud Bay and some areas along Rocky Point have intact riparian vegetation.

Restoration Strategy

The developed single-family area provides a variety of buffer conditions varying from wide buffers of native trees to lawn and ornamental vegetation. Where ornamental vegetation predominate, s adverse impacts of discharge of runoff containing sediment, and toxins from pesticides and herbicides are likely most effectively addressed by public education.

Many lots have the potential for subdivision when urban serves such as sewers are provided. The SMP buffer requirements are likely to result in preservation of existing buffers and some enhancement of where buffers are not currently maintained. The addition or enhancement of native vegetation buffers adjacent to the water (to provide filtering and uptake of pollutants and provide shading to reduce desiccation of the nearshore) may be addressed by educational and voluntary planting of buffers. As non-subdividable properties undergo major remodeling or redevelop minimal buffers on the shoreline are required. Cumulatively these efforts are likely to benefit both water quality and nearshore habitat.

Existing docks and moorage facilities are limited in number and size, but will require enhancement to include grading for light penetration and less surface coverage as they reach the end of their useful life and require major repair or replacement. New over-water and in-water structures are limited by the proposed "Aquatic Conservancy" designation.

5.2.2 Port Washington Narrows

Port Washington Narrows is a tidal strait connecting Port Orchard Bay with Dyes Inlet. Tidal currents attain velocities in excess of 4 knots at times. The formal boundaries are Rocky Point to the northeast and Point Turner on the southwest side and Point Herron on the southeast side. For the purpose of this discussion, the Tracyton Beach area is formally within Dyes Inlet will be included in discussion of the east side of the Narrows.

5.2.2.1 Phinney Bay

Phinney Bay is a large embayment at the western end of Port Washington Narrows and eastern end of Dyes Inlet and extends from Rocky Point to N. Lafayette Avenue.

Phinney Bay has some high bank areas on the eastern shore, but is mostly low bank and/or marsh lagoon shoreforms, with mud, sand, and gravel substrates dominating. One surf smelt spawning location is mapped on the northeast side of Phinney Bay. Non-floating kelp occurs along the northeastern side, with continuous eelgrass along most of the Bay shoreline, and patchy salt marsh at the southern end and in the lagoon in the western side of the Bay. Eelgrass is mapped in continuous distribution along the south and west shores of Phinney Bay. Some oyster beds occur at the north end of the Bay, although Phinney Bay is currently classified as a Prohibited Shellfish Growing area. Water quality issues include fecal coliform, and possibly dissolved oxygen. Phinney Creek is listed by the Kitsap Health District on a Public Advisory of waters that public should avoid contact with. The bay has a large number of stormwater outfalls, especially on the western side.

The eastern side of Phinney Bay (to Corbet Dr. NW) is currently outside of the Bremerton city limits but in the UGA. The primary land use is single family residential, but there is one marina, the Bremerton Yacht Club on the eastern shore. About 30% of the drainage area contributing to Phinney Bay has impervious surfaces greater than 50%, but a relatively large portion of the drainage area (55%) is covered by less than 10% impervious surface. This is due to the mostly natural land cover and cover is mostly low intensity residential but with some mixed forest.

Shoreline modifications include moderately high levels of shoreline armoring (64% of shoreline length), roads affecting the shoreline (8% of shoreline area), and overwater structures (5% of shoreline area). Most of the overwater structure area is contributed by the single large marina.

Restoration Strategy

The east side of the bay (currently unincorporated Kitsap County) contains large single-family lots with a variety of buffer conditions varying from wide buffers of native trees to lawn and ornamental vegetation. On the west side of the bay smaller urban lots generally have more limited buffer and predominantly lawn and ornamental vegetation. Where non-native vegetation predominates, adverse impacts of discharge of runoff containing sediment, and toxins from pesticides and herbicides are likely most effectively addressed by public education.

Many lots on the east side have the potential for subdivision when urban serves such as sewers are provided. The SMP buffer requirements are likely to result in preservation of existing buffers and some enhancement of where buffers are not currently maintained. For existing lots, the addition or enhancement of native vegetation buffers adjacent to the water may be addressed by educational and voluntary planting of buffers. As non-subdividable properties undergo major remodeling or redevelop minimal buffers on the shoreline are required. Cumulatively these efforts are likely to benefit both water quality and nearshore habitat by providing filtering and uptake of pollutants and providing shading to reduce desiccation of the nearshore.

Existing docks and moorage facilities will require enhancement to include grading for light penetration and less surface coverage as they reach the end of their useful life and require major repair or replacement. New over-water and in-water structures in the far south end of the bay are limited by the proposed "Aquatic Conservancy" designation.

The City may contribute to water quality in the bay through incremental improvements in the storm drainage system and in public education that reduces discharge of nutrients and toxins into the system.

5.2.2.2 Port Washington Narrows West

This area extends from N. Lafayette Avenue to Point Turner (which for convenience we will consider at 6th Street in downtown Bremerton.) This area has complex urban land uses including single-family and multi-family residential, industrial, and parkland. A few locations for surf smelt spawning are mapped along this reach. Most of the shoreline is mapped with continuous non-floating kelp, but no eelgrass or marsh vegetation is mapped here. Hardshell clam areas occur along the Narrows, but mostly associated with the eastern shore. Waterfowl concentrations occur at the entrance to the Narrows, between the ferry docks and Evergreen Park.

Shoreline modifications include heavily armored shorelines (80% shoreline length), numerous roads (12% of shoreline area), and fill within the nearshore (2% of the area) In addition, numerous overhanging structures; piers, docks, and floats; and old pilings occur along the Narrows shoreline.

Impervious surfaces along shoreline are mostly above 50% and 90-100% at some locations including along the Bremerton waterfront, where the Warren Avenue Bridge crosses the Narrows, and just east of Anderson Cove. Land cover is predominantly high intensity residential or commercial industrial, with small areas of low intensity residential.

Restoration Strategy

Single-family lots in this area generally have little or no native vegetation buffer. Public education is the primary means of influencing individuals to change vegetation management to include more native vegetation along the shoreline and has the potential to influence a much greater proportion of the shoreline. As single-family properties undergo major remodeling or redevelop, minimal buffers on the shoreline are required. Cumulatively education and regulatory requirements are likely to benefit both water quality and nearshore habitat by providing native vegetation that contributes filtering and uptake of pollutants and providing shade to reduce desiccation of the nearshore.

Existing docks and moorage facilities will require enhancement to include grading for light penetration and less surface coverage as they reach the end of their useful life and require major repair or replacement.

There are very limited areas of industrial and multi-family zoning which may provide opportunities for enhancement of the shoreline upon redevelopment. The industrial area near Pennsylvania Ave. has the potential for some restoration of the shoreline as part of future non-water-dependent development which requires shoreline restoration and public access. The extent of restoration required would depend on the extent of water-dependent development and the extent that mitigation may be required to meet criteria for no net loss of ecological functions.

The multi-family area within the Downtown Subarea will be redeveloped with medium to high density residential with a strong relationship to the street. The high bank waterfront limits other than visual access to the water in most cases. As part of redevelopment buffer areas will be augmented and feeder bluff function enhanced.

Public parks provide a variety of opportunities for enhancement of native riparian vegetation depending on topography and other conditions implemented as part of ongoing park management. Enhancement opportunities, however, must be balanced with goals of providing public visual and physical access to the shoreline.

The City may contribute to water quality in the bay through incremental improvements in the storm drainage system and in public education that reduces discharge of nutrients and toxins into the system.

5.2.2.3 Port Washington Narrows East

The far northerly portion of Port Washington Narrows is characterized by large lot rural development in the area north of Sheridan Road which is in unincorporated Kitsap County and within the UGA. The balance of the reach is single-family, multi-family, commercial and park use. (For convenience, the area south of Manette Bridge on Point Herron is considered in the discussion of Port Orchard Bay.)

Three streams discharge into this area, but most of the natural conveyances have been covered and are contained in culverts, however. Parmann and Moser Creeks north of Tracyton Beach Road still have continuous vegetation along much of the riparian area.

A few locations for surf smelt spawning are mapped along this reach. Most of the shoreline is mapped with continuous non-floating kelp, but no eelgrass or marsh vegetation is mapped here. Hardshell clam areas occur along the eastern shore, however the area is closed to shellfish harvest. Waterfowl concentrations occur at the entrance to the Narrows. Sheridan Park, Lyons Park, and East Park occur along this reach.

Shoreline modifications include heavily armored shorelines (80% shoreline length), numerous roads (12% of shoreline area), and fill within the nearshore (2% of the area). In addition, numerous overhanging structures; piers, docks, and floats; and old pilings occur along the Narrows shoreline.

Impervious surfaces along shoreline are mostly above 50% and mostly 90-100% at some locations including where the Warren Avenue Bridge crosses the Narrows. Land cover is predominantly high intensity residential or commercial industrial, with small areas of low intensity residential.

Restoration Strategy

Single-family lots with shoreline frontage predominate only in the currently unincorporated area north of Tracyton Beach Road. Most lots have no native vegetation at the shoreline with lawns and ornamental vegetation the primary ground cover. Many of these lots have the potential for subdivision when urban serves such as sewers are provided. The SMP buffer requirements implemented at subdivision are likely to result in provision and enhancement of where native vegetation buffers. In the interim, and for properties not subdividable, educational may lead to some changes in vegetation management leading to voluntary establishment of limited buffers. Cumulatively education and regulatory requirements are likely to benefit both water quality and nearshore habitat by providing native vegetation that contributes filtering and uptake of pollutants and providing shade to reduce desiccation of the nearshore.

There are extensive areas of commercial and multi-family zoning in this reach which are likely to provide opportunities for enhancement of the shoreline upon redevelopment. The most extensive probable redevelopment area is the Bremerton Gardens multi-family community between Magnuson Way and 16th Street which will provide the opportunity for setbacks and buffers to allow feeder bluffs and adjacent areas to function more naturally. The commercial area along Campbell and Wheaton Way south of the Warren Avenue Bridge will likely redevelop incrementally. Because non-water-dependent development requires shoreline restoration and public access, buffer areas will be augmented and feeder bluff function enhanced.

Existing docks and moorage facilities will require enhancement to include grading for light penetration and less surface coverage as they reach the end of their useful life and require major repair or replacement.

Public parks provide a variety of opportunities for enhancement of native riparian vegetation depending on topography and other conditions implemented as part of ongoing park management. Enhancement opportunities, however, must be balanced with goals of providing public visual and physical access to the shoreline.

The extensive, but narrow corridor between the shoreline and Tracyton Beach Road may be enhanced by augmentation of native vegetation.

The City may contribute to water quality through incremental improvements in the storm drainage system and in public education that reduces discharge of nutrients and toxins into the system.

5.2.3 Sinclair Inlet

Sinclair Inlet is the arm of Port Orchard Bay west of Port Washington Narrows. It includes the Bremerton Downtown, the US Navy Puget Sound Shipyard, Gorst Estuary and the City of Port Orchard on its south side.

The Sinclair Inlet watershed drains an area of 27,492 acres, including the creeks that flow into Sinclair Inlet (primarily along the southern shore) and the Beaver Creek watershed to the east. The watershed includes 57 miles of saltwater frontage, approximately 46 lakes with 9.7 miles of shoreline, and about 62 miles of streams. The watershed is characterized by many small streams that drain relatively small areas. Gorst and Blackjack creeks are the main dischargers of freshwater into the Inlet. Estimates of freshwater runoff into Sinclair Inlet

range from 335 cfs in January to 5 cfs in August. The contribution of groundwater flow to the inlet is unknown but thought to be substantial. The currents of Sinclair Inlet are relatively weak, at only 0.8 knots. The estimated total flushing time is approximately 14 days.

5.2.3.1 Downtown Bremerton

The area from 6th Street to the Puget Sound Naval Shipyard within the Downtown Subarea will be redeveloped with an array of residential, office and mixed uses with strong connections and views to the waterfront. Most of this area has been redeveloped with only a few additional lots available. This area has high bluffs along the waterfront that precludes water-dependent use. Because non-water-dependent development requires shoreline restoration and public access, buffer areas will be augmented and feeder bluff function enhanced.

The City may contribute to water quality through incremental improvements in the storm drainage system and in public education that reduces discharge of nutrients and toxins into the system.

Restoration Strategy

Restoration potential in this reach are limited due to intense urban development.

Future development in the downtown will preserve and enhance steep slopes resulting in augmentation of vegetation and feeder bluff function.

The City may contribute to water quality through incremental improvements in the upstream storm drainage system and in public education that reduces discharge of nutrients and toxins into the system.

5.2.3.2 Puget Sound Naval Shipyard

This reach is heavily modified by the development of the Naval Shipyard. Impervious surface along shoreline is more than 80% and frequently more than 90% along the entire shoreline. More than 90% of the shoreline length is armored and overwater structures affect approximately 50% of the shoreline area.

Restoration Strategy

Restoration potential in this reach is limited due to intense development.

The major opportunity for enhancement is continuing efforts by the Navy to improve to water quality through improvements process water and runoff.

5.2.3.3 Gorst estuary and Gorst Creek

Gorst Estuary is the largest estuary in the planning area and provides significant shoreline functions to Sinclair Inlet and Puget Sound. The estuary receives freshwater flows from Gorst Creek, as well as several small independent drainages nearby. Wright Creek is about 1.2 miles long and enters Sinclair Inlet between Gorst and Bremerton. Tributary streams support a variety a species including coho, chum, cutthroat, and steelhead.

Gorst estuary itself is shallow, with fringing marshes and mud flats that provide excellent production of prey for salmonids. Biological resources in the estuary include waterfowl concentrations at the mouth and along the north and south shorelines of Sinclair Inlet, and shorebird concentrations along the north shore. Continuous mixed marsh and patchy salt marsh occurs along the inner estuary and north and south shorelines of Sinclair Inlet. Patchy eelgrass occurs between the edge of the marsh vegetation and adjacent mud and sand flats. Surf smelt spawning areas are mapped along the north and south shore if Sinclair Inlet just

east of the estuary. Bald eagle nests are associated with the estuary along the south shore of Sinclair Inlet with nest management and foraging areas within the entire estuary.

Shoreline modifications include significant alteration to tidal processes, with tidal barriers affecting 6% of shoreline length. Shoreline armoring affects 88% of shoreline length, road density is high (18% shoreline area), overwater structures affect 4% of shoreline area, and nearshore fill affects 20% of shoreline area. These modifications are reflected in the loss of habitats. Estimates of the loss of historic shoreforms include 100% of former barrier estuaries, 65% of coastal inlets, and more than 80% of tidal wetlands.

About 1,500 feet of estuarine shoreline on the north side of the inlet were rehabilitated in the early 2000s through grants from the Salmon Recovery Board and funding by local sources.

Restoration Strategy

The City of Bremerton is in the process of developing the Gorst Creek Watershed Comprehensive Plan which will outline development opportunities and preservation and enhancement opportunities. The plan is not yet final, but generally will:

- Identify portions of the watershed which should be conserved and managed to protect the City's water supply.
- Identify areas that should be preserved for enhancement of water supply to the watershed and estuary, including wetlands and other areas.
- Identify areas that should be preserved and enhanced for habitat value score and as salmon refugia.
- Identify areas more appropriate for higher density development based on identification of areas with lower water resource and habitat value.

There are extensive areas of commercial development generally south of Gorst Creek that are subject to redevelopment in the future. Because non-water-dependent development requires shoreline restoration and public access, buffer areas will be augmented and proximity impacts to the estuary reduced.

The City may contribute to water quality through incremental improvements in the storm drainage system in developed portions of the estuary and in public education that reduces discharge of nutrients and toxins into the system.

5.2.4 Port Orchard Bay

5.2.4.1 Point Herron/Shore Drive

For purposes of this analysis, this reach extends from the Manette Bridge to the northeasterly end of shore Drive. The northerly end of this reach is occupied by the Boat House Restaurant and multi-family development. The balance of the reach is single family lots about 50 feet wide and between 70 and 100 feet deep. The shoreline is more than 50% impervious surface. The watershed area is also single-family residential. There is a large pier at the Boat House Restaurant and half a dozen marine railways at single family residences, although not all are currently functioning. Almost the entire shoreline is armored with rip-rap and concrete bulkheads. There are virtually no trees along the shoreline and in many places very narrow lawns or ornamental plantings

Restoration Strategy

There are few opportunities for restoration in the reach.

The Boat House Restaurant is likely to retain its existing non-conforming status, even if other tenants occupy it. In the long term, the existing pier would be reconstructed when it required major repair or replacement to include grading for light penetration and less surface coverage which will enhance nearshore ecological functions.

If the multi-family development were to redevelop, very minor buffers might be included.

The proposed provisions of the SMP to provide minimal buffers when residences undergo major renovation and replacement may reduce somewhat the discharge of nutrients and toxins from fertilizers and herbicides/pesticides, but is unlikely to provide shading that will affect upper beach desiccation.

The City may contribute to water quality through incremental improvements in the storm drainage system and in public education that reduces discharge of nutrients and toxins into the system.

5.2.4.2 Port Orchard Bay East

The area east of Shore Drive in Bremerton is characterized by large single-family lots with extensive forested uplands. Portions of the areas are within the City, the balance is in the UGA. Percent impervious within 200 feet of the marine shoreline ranges from 8% to 17%, while forest cover within the 200 foot shoreline area averages less than 2%. Over 50% of the shoreline is armored, with 6% of the shoreline affected by roads.

A small independent creek (Dee/Enetai) enters Port Orchard Bay approximately 1.0 mile northeast of Point Heron. The creek currently supports chum, coho, and cutthroat in the lower reaches. There are a number of fish passage barriers in this watershed. Riparian condition upstream of Trenton Avenue is poor, with little remaining riparian vegetation. Riparian condition in the steep ravine reach downstream of Trenton Avenue is considered to be generally good. Flows are very flashy, likely the result of the intense development in the watershed with no stormwater controls. This creek also has a fecal bacterial problem.

The eastern part of this reach in the UGA is largely undeveloped within the UGA with development above the steep bluff that begins at the shoreline.

Restoration Strategy

The preservation of existing undeveloped shoreline in the eastern part of the reach is likely to be accomplished by the proposed Urban Conservancy designation with likely future development concentrated at the top of the slope.

Large lots in this area have a variety of buffer conditions varying from wide buffers of native trees to lawn and ornamental vegetation. Where non-native vegetation predominates, adverse impacts of discharge of runoff containing sediment, and toxins from pesticides and herbicides are likely most effectively addressed by addition or enhancement of native vegetation buffers adjacent to the water through educational and voluntary planting of buffers. As non-subdividable properties undergo major remodeling or redevelop minimal buffers on the shoreline are required. Cumulatively these efforts are likely to benefit both water quality and nearshore habitat by providing filtering and uptake of pollutants and providing shading to reduce desiccation of the nearshore.

The City may contribute to water quality in the bay through incremental improvements in the storm drainage system that discharges into Dee/Enetai Creek and in public education that reduces discharge of nutrients and toxins into the system. Installation of a public sewer system as recommended by the Health District in areas served by failing OSS would address the major source of fecal contamination.

5.2.5 Kitsap Lake

Kitsap Lake is within the Chico Creek drainage. The lake is approximately 238 acres in size and the shoreline includes land within the City of Bremerton, as well as land within unincorporated Kitsap County. There is a large wetland at the south end of the lake which is larger in public ownership. Most of the lake shoreline is single-family residential lots , with numerous docks, large areas of modified shoreline, and very little riparian vegetation. There is a large wetland on the south side of the lake, a City park, and an Navy park on the west side of the lake.

The lake supports resident cutthroat, coho, steelhead, and pink salmon. There is one bald eagle nest and foraging area along the shoreline.

Restoration Strategy

The major restoration activity that will contribute to water quality in the lake is protection and restoration of the upstream tributaries which are addressed in the Chico Creek Management Strategy.

Public parks owned by the City, the county and the navy provide a variety of opportunities for enhancement of native riparian vegetation depending on topography and other conditions implemented as part of ongoing park management. Enhancement opportunities, however, must be balanced with goals of providing public visual and physical access to the shoreline.

Single-family lots with shoreline frontage predominate on the shoreline. Lots are relatively small and narrow. Most lots have no native vegetation at the shoreline with lawns and ornamental vegetation the primary ground cover. Few of these lots have the potential for subdivision. Educational may lead to some changes in vegetation management leading to voluntary establishment of limited buffers. Where substantial remodeling or replacement occurs, minimal buffers are required. Cumulatively education and regulations are likely to benefit both water quality and nearshore habitat by providing native vegetation that contributes filtering and uptake of pollutants. It is doubtful that such minimal buffers will provide much shade or woody debris.

The majority of the lake shoreline is armored. As bulkheads need replacement in the future, regulations will require consideration of softer armoring, which may lead to more natural shoreline conditions supporting a more productive food web and other functions.

Existing docks and moorage facilities will require enhancement to include grading for light penetration and less surface coverage as they reach the end of their useful life and require major repair or replacement.

5.2.6 Union River and Union River Reservoir

The Union watershed flows into Hood Canal, is 24 square miles with 10 miles mainstem and 30 miles of tributaries. The stream originates on the south and eastern sides of Gold Mountain. It flows through managed but undeveloped forest area to The City of Bremerton Union River Reservoir (the City's major water supply). The Union River reservoir has a surface area of about 40 acres. Shoreline reaches include the entire lake shoreline, as well as the Union River below the reservoir from McKenna Falls to the lake. The combined lake and river shoreline area is approximately 98 acres. The upper watershed and the reservoir are within the City's protected watershed area with deciduous, evergreen and mixed forest as the predominant land cover.

The Union River system supports chinook, pink, coho, fall-winter chum, summer chum, steelhead, and cutthroat. The Union River is the only basin on the Kitsap Peninsula to currently have a viable native population of summer chum salmon. The lake and river reaches

within shoreline jurisdiction support resident cutthroat with the potential of presence of coho and steelhead. The Kitsap Refugia report rated the instream habitat and riparian conditions for the river as a whole as generally fair to good Riparian conditions in the lake and river reaches within shoreline jurisdiction are in good condition, with forested riparian zones on both sides of the river and around the lakeshore. The upper watershed has numerous headwater wetland complexes, providing extensive rearing habitat for salmonids. McKenna Falls is a natural barrier to fish passage upstream, and is located just downstream of the Union Reservoir dam.

Water quality impairments include low dissolved oxygen and pH in the shoreline reaches downstream of the reservoir.

The reservoir and river reach within shoreline jurisdiction are surrounded by the City's 3,000 acre protected watershed area. The Public Works and Utilities Department, Forestry & Natural Resources Division manages the utility owned forest lands for watershed protection, timber harvest, reforestation, biosolids utilization and salmon restoration.

Restoration Strategy

No restoration needs have been identified in the City-owned portion of the Union River. There are numerous downstream restoration programs included in the Hood Canal Coordinating Council's Habitat Recovery Strategy for the Hood Canal and Eastern Strait of Juan de Fuca, version 09-2005

5.2.7 Twin Lakes

Twin Lakes together are approximately 21.7 acres in size and lie within the City's utility area. Twin Lakes are maintained by a diversion of water from the Union River Reservoir. The lakes are on the hydrologic boundary between the Union River and Gorst Creek watersheds. There is no surface drainage out of the Twin Lakes. Studies by the City of Bremerton indicate that approximately half of the groundwater flow out of the Twin Lakes is to the Union River watershed and half to the Gorst Creek watershed. Twin Lakes is located towards the western end of the Gorst Creek Aquifer Recharge area. In recognition of the importance of the lake to groundwater recharge, BMC 20.14.430(6)(b)(8) prohibits use of pesticides, and fertilizers above agronomic rates within 1600 feet of Twin Lakes. The area around Twin Lakes is zoned primarily as utility lands, with some area of low density residential zoning immediately to the east, and the industrially zoned South Kitsap Industrial Area is immediately to the south. Twin Lakes shorelines are currently designated as Urban Conservancy.

Restoration Strategy

No restoration needs have been identified in the Twin Lakes Watershed.

5.3 PROJECT IMPLEMENTATION, MONITORING, AND REVIEW

To remain consistent with restoration framework and guidance for SMP development, project implementation and monitoring will survey available funding sources, guide development of project timelines and benchmarks, and document progress of restoration projects.

5.4 BENCHMARKS AND MONITORING

Under WAC 173-26- 201(2)(f)(vi), the development of a jurisdiction's SMP must, "Provide for mechanisms or strategies to ensure that restoration projects and programs will be implemented…in meeting the overall restoration goals."

A restoration framework developed in part by Palmer et al (2005) provides several tasks for assessing restoration actions and revising the planning process to meet restoration goals. The following actions include:

- Adaptively manage restoration projects;
- Summarize restoration progress including grant applications and funds secured;
- Monitor post-restoration conditions;
- Revise the planning process to reflect changes in objectives and policy re-evaluation; and
- Use monitoring and maintenance results to inform future restoration activities.

To document progress toward restoration goals regionally within WRIA 15 and locally within the City, annual assessments should occur to determine how well restoration criteria are met and how effectively the goals of this restoration plan are achieved.

5.5 SMP REVIEW

To ensure that restoration goals are being met, it is important for the City to evaluate the effectiveness of this plan and to adapt to changing conditions. To establish the SMP benchmark for implementation effectiveness, the legislature provided a timeframe for jurisdiction amendments to the SMP. This was amended in 2011 to provide an eight year update schedule.

The 8-year period starts once the City of Pacific amends its SMP (RCW 90.58.080 (4)(a)). While the review period is taking place, an ongoing assessment of project successes and limitations must still occur as restorations are planned and implemented within the City.

6. REFERENCES

See

City of Bremerton, Shoreline Master Program, Revised Shoreline Inventory and Analysis. Prepared by Parametrix, Bellevue, Washington. December 2010

http://www.ci.bremerton.wa.us/forms/communitydev/smp/ShorelineInventory_Analysis.pdf

City of Bremerton
Shoreline Master Program Update
DRAFT
Shoreline Cumulative Effects Analysis

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ACRONYMS

BAP	Best Available Practices
BMP	Best Management Practices
CREP	Conservation Reserve Enhancement Program
FEMA	Federal Emergency Management Agency
GIS	Geographic Information Systems
HPA	Hydraulic Project Approval
LWD	Large Woody Debris
MRC	Marine Resources Committee
NPDES	National Pollutant Discharge Elimination System
OFM	Office of Financial Management
RMC	City of Bremerton Municipal Code
SEDs	Shoreline Environment Designations
SMA	Shoreline Management Act
SMP	Shoreline Management Plan
UGA	Urban Growth Areas
USFWS	United States Fish and Wildlife Service
WAC	Washington Administrative Code
RMC	City of Bremerton Municipal Code
WDFW	Washington Department of Fish and Wildlife
WMU	Watershed Management Unit

1. SUMMARY

This report supports City of Bremerton's Shoreline Management Program (SMP) update. The City's SMP, also known as Title 16 of the City of Bremerton Code (BMC), is being updated to comply with the Washington State Shoreline Management Act (SMA or the Act) requirements (RCW 90.58), and the state's shoreline guidelines (Washington Administrative Code [WAC] 173-26, Part III), which were adopted in 2003.

The SMP update process involves the following steps:

1. Reviewing and revising shoreline goals and policies
2. Inventorying and analyzing shoreline conditions
3. Determining shoreline environment designations (SEDs)
4. Assessing cumulative impacts of shoreline development
5. Preparing a restoration plan

This element assesses the cumulative impacts of shoreline development under the current proposed revisions to the SMP.

This work was funded in part through a grant from the Washington State Department of Ecology.

The key criteria this analysis of cumulative effects addresses is avoidance of a net loss of ecological functions. Specific direction includes:

> Local master programs shall evaluate and consider cumulative impacts of reasonably foreseeable future development on shoreline ecological functions and other shoreline functions fostered by the policy goals of the act. To ensure no net loss of ecological functions and protection of other shoreline functions and/or uses, master programs shall contain policies, programs, and regulations that address adverse cumulative impacts and fairly allocate the burden of addressing cumulative impacts among development opportunities.(WAC 173-26-186(8)(d))

In general, the findings of this analysis, as it applies to Bremerton shorelines are:

- Freshwater aquatic resources in Bremerton largely consist of relatively small watersheds that discharge directly into marine waters. In these watersheds urbanization has led to changes in land use and vegetation cover that result in substantial changes to the hydrologic and water quality character of inputs of fresh water to both fresh water and marine systems.
- Marine shorelines in Bremerton vary greatly in character. Some are very protected inlets such as Oyster Bay are shallow with little freshwater recharge and limited tidal flushing, others such as Port Washington Narrows experience substantial flows from tidal action.
- Marine shorelines in Bremerton are largely developed. In most cases native vegetation has been removed and other components that support natural ecological processes altered. The full range of natural ecological functions does not take place in those areas. Important ecological functions, however, continue and support the general ecological productivity of the local and regional aquatic and marine ecosystems.
- There are three relatively undeveloped freshwater watersheds in Bremerton partially under Shoreline Management Act Jurisdiction. Two of these, the Union River and

Reservoir and Twin Lakes have been protected for water supply. The third, Gorst Creek is subject to future urban development. At the current time, all of these have relatively intact native land cover and vegetation cover that preserve a natural hydrologic cycle emphasizing interflow and moderating peak flows as well as preserving riparian corridor interactions between aquatic and upland resources.

- It is not known, at this time, whether general trends in ecological degradation from human disturbance are continuing to result in incremental degradation of ecological functions or whether localized ecosystems have reached a stable condition. There is no scientific consensus on appropriate indicators of ecological productivity and no comprehensive means of monitoring. Based on the continuing trends of declines in key aquatic species in Puget Sound over several decades the most justifiable conclusion is that existing land use and practices within watersheds and along shorelines are continuing to degrade habitat and trends will continue unless substantial changes in practices are implemented in many areas.
- Specific ongoing contributions to degradation of the nearshore that are present and will likely continue, unless substantial changes are made too physical facilities include
- Existing ornamental vegetation typical management practices including use of fertilizers, herbicides and pesticides affect not only the nearshore food chain but also have identified impacts on the central pervious system functions of fish, including salmonids;
- Shoreline bulkheads have negative impacts on substrate through interfering with natural recruitment sources, especially on feeder bluffs, in some cases they produce a high energy environments because of reflective wave action and also contribute to the absence of shoreline vegetation;
- The lack of native vegetation on the shoreline likely contribute to the absence of a near-shore food chain and also result in higher nearshore temperatures due to the lack of shade;
- Current docks and other moorage facilities contribute to predation and also may cause avoidance behavior in salmonids forcing them out of nearshore environments and into environments where food and shelter are less available and where predation is increased.

Actions in Bremerton, in conjunction with other jurisdictions, are likely to be important in slowing or reversing trends related to human induced changes. These include:

- Restoring water quality functions by providing buffer areas in which sediment, nutrients, pathogens and other pollutants can be removed or entrained;
- Providing urban stormwater management to address hydrologic functions such as peak flows as well as water quality
- Moderating temperature in intertidal and stream environments through restoring riparian vegetation;
- Restoring the water quality and habitat functions of wetlands and estuaries
- Restoring wetlands and estuaries displaced by other uses;

Such efforts however will be effective only if undertaken system-wide and address ongoing impacts of existing uses.

Overall, the combined results of the Shoreline Master Program (SMP) on properties immediately adjacent to shorelines, the Critical Areas regulations which address upstream conditions in watersheds not under SMP jurisdiction and a variety of restoration activities on shorelines and in watersheds is likely to result in no net loss of ecological functions on Bremerton shorelines and will likely result in improvement over time.

1.1 REPORT PURPOSE

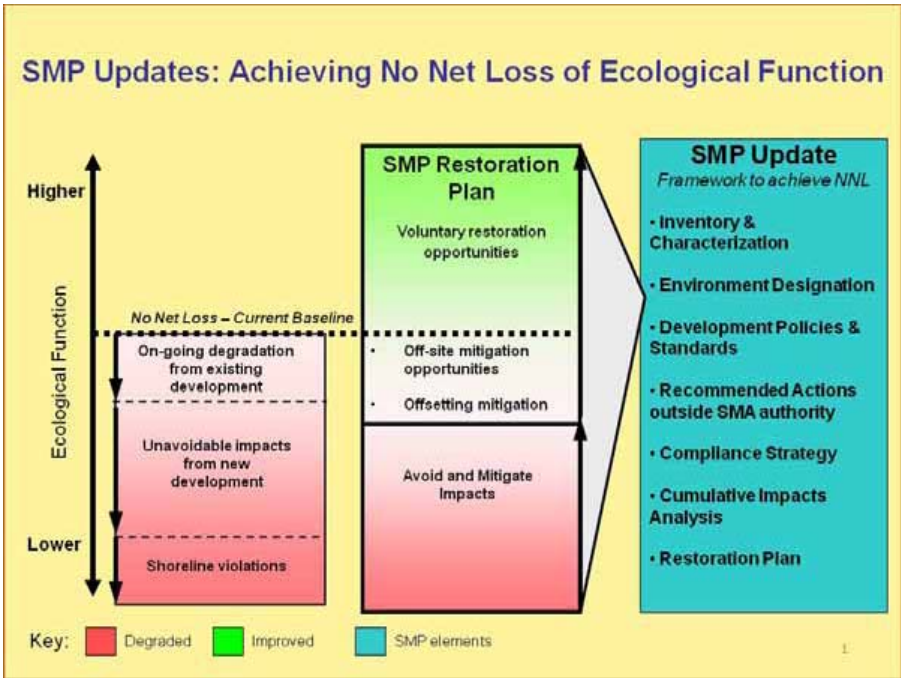
The Shoreline Management Act Guidelines (WAC 173-26-18683)(d) require analysis of cumulative impacts "to ensure no net loss of ecological functions and protection of other shoreline functions and/or uses.

The principle that regulation of development shall achieve no net loss of ecological function requires that master program policies and regulations address the cumulative impacts on shoreline ecological functions that would result from future shoreline development and uses that are reasonably foreseeable from proposed master programs.

The guidelines provide specific guidance on the concept of no net loss in WAC 173-26-201(2)(c) and the relation between regulations and other programs:

> When based on the inventory and analysis requirements and completed consistent with the specific provisions of these guidelines, the master program should ensure that development will be protective of ecological functions necessary to sustain existing shoreline natural resources and meet the standard. The concept of "net" as used herein, recognizes that any development has potential or actual, short-term or long-term impacts and that through application of appropriate development standards and employment of mitigation measures in accordance with the mitigation sequence, those impacts will be addressed in a manner necessary to assure that the end result will not diminish the shoreline resources and values as they currently exist. Where uses or development that impact ecological functions are necessary to achieve other objectives of RCW 90.58.020, master program provisions shall, to the greatest extent feasible, protect existing ecological functions and avoid new impacts to habitat and ecological functions before implementing other measures designed to achieve no net loss of ecological functions.
>
> Master programs shall also include policies that promote restoration of ecological functions, as provided in WAC 173-26-201 (2)(f), where such functions are found to have been impaired based on analysis described in WAC 173-26-201 (3)(d)(i). It is intended that local government, through the master program, along with other regulatory and nonregulatory programs, contribute to restoration by planning for and fostering restoration and that such restoration occur through a combination of public and private programs and actions. Local government should identify restoration opportunities through the shoreline inventory process and authorize, coordinate and facilitate appropriate publicly and privately initiated restoration projects within their master programs. The goal of this effort is master programs which include planning elements that, when implemented, serve to improve the overall condition of habitat and resources within the shoreline area of each city and county.

This difference between the role of regulatory and nonregulatory programs is illustrated conceptual form in Exhibit 1-1, below.



Source: Washington Department of Ecology

Figure 1-1. Achieving No Net Loss through Regulations and Restoration

1.2 APPROACH

Evaluation of cumulative impacts is required to consider (WAC 173-26-186(8):

- Current circumstances affecting the shorelines and relevant natural processes;
- Reasonably foreseeable future development and use of the shoreline; and
- Beneficial effects of any established regulatory programs under other local, state, and federal laws."

This cumulative impacts assessment uses these three considerations as a framework for evaluating the potential long-term impacts on shoreline ecological functions and processes that may result from development or activities under the proposed SMP over time. The methodology used in this cumulative analysis is based on:

- Current circumstances affecting the shorelines and relevant natural processes are based on the findings outlined in the Inventory/Characterization Report
- Description of foreseeable future development is addressed in Section 2 of this report
- Beneficial effects of any established regulatory programs under other local, state, and federal laws and this SM: is addressed in Section 2 and addresses:

- Projection of the likely effects of future development on shoreline and watershed functions utilizing the "Landscape Analysis" provided in the Inventory and Characterization
- Projection of the likely beneficial effects of any established regulatory programs under other local, state, and federal laws as well as non-regulatory

Existing conditions are addressed in the landscape characterization provided in the City of Bremerton Draft Inventory and Characterization Report, December 2010. A brief summary of the methodology is provided below. Please refer to Part I of the Inventory and Characterization Report for more detail.

1.3 STUDY AREA CHARACTERISTICS

The City of Bremerton is located on the western side of Puget Sound, in the central portion of Kitsap County, about 15 miles west of Seattle as indicated in Figure 1-2. Jurisdictional shorelines in the City lie within Water Resource Inventory Area [WRIA] 15, which encompasses all of Kitsap County and portions of Mason, Pierce, and King Counties (Vashon Island). Bremerton is located in the eastern portion of WRIA 15, or the East Kitsap Watershed, and most of the area is comprised of numerous small drainages flowing directly into Puget Sound.

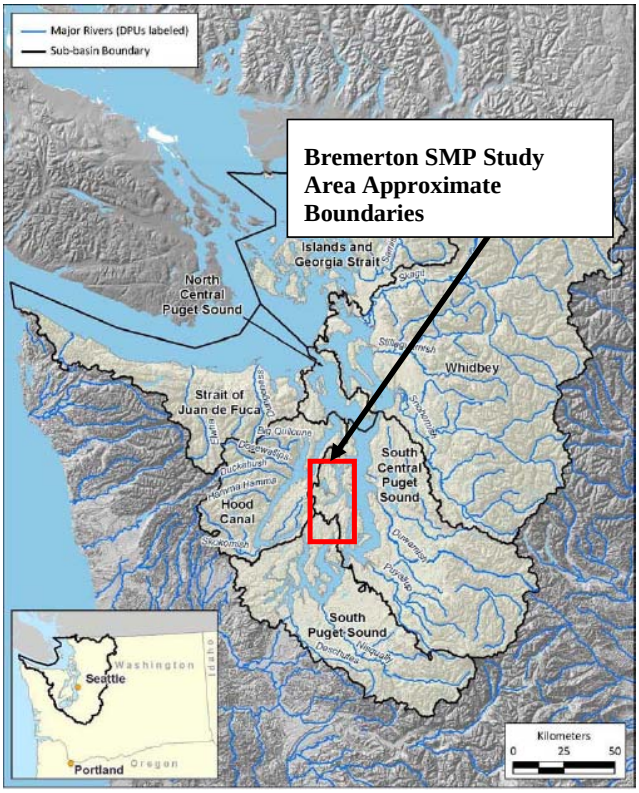


Figure 1-2. Puget Sound Context of Bremerton shorelines.

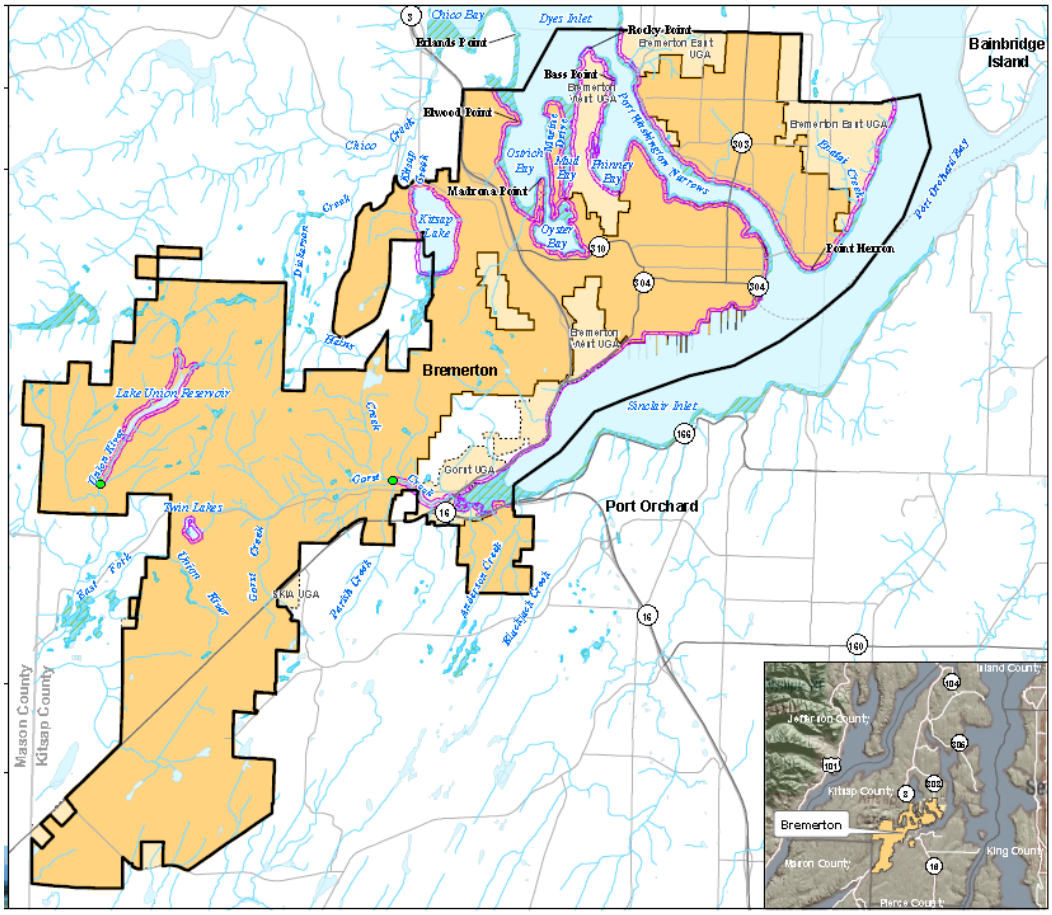


Figure 1-3. Study area for the ecosystem characterization of Bremerton shorelines.

The study area for freshwater shorelines includes drainage areas or sub-basins for the major streams and lakes, such as Gorst Creek, Kitsap Lake, and the Union Reservoir (Figure 1-3). Portions of the study area to the west and southwest of Gorst drain into the Union River and ultimately into Hood Canal.

The marine waters of Puget Sound have been divided into sub-basins based on geography, oceanographic conditions (circulation, bathymetry, wave exposure), and common socio-economic issues and interests. Sub-basins, however, are classified somewhat differently by different studies. For this ecosystem-wide characterization, the study area for marine shorelines encompasses Dyes and Sinclair Inlets, as well as the Port Washington Narrows, which connects Dyes and Sinclair Inlets, and a portion of Port Orchard Bay north of Sinclair Inlet.

There are a number of features of the local context that are important in understanding the context in which the SMP and other programs will operate.

1.3.1 Geology

The East Kitsap Watershed is geologically and topographically similar to other areas in the Puget Sound region, reflecting the influences of mountain building and glacial activity. The Pleistocene Epoch (or Ice Age), which began about 2 million years ago, formed most of the geologic features present in the watershed today. Cordilleran Ice Sheets, which originated in the coast and insular mountains of British Columbia, moved south to the southern end of the Puget Sound basin near Olympia. Up to 3,500 feet of glacial ice covered the Kitsap Peninsula. Geologic units from at least five major and several minor glacial advances have been identified in the Puget Sound basin, although only three are exposed (visible) in Kitsap County.

Surface geology in the study area is a complex mix of these glacial deposits, which include unconsolidated silts, sands and gravels and typically cover a hardpan lying just below the surface. In the study area watersheds (Chico Creek, Gorst Creek, Union River), bedrock underlies the upper sections of watershed tributaries whereas the lower areas are underlain by glacial till, recessional outwash, and advance outwash deposited during the last ice-sheet advance. (Sossa 2003). Bluffs along the Puget Sound are being eroded and re-deposited as beaches and spits. Streams are eroding their banks and then depositing sediments in floodplains, wetlands, and bays. Soils in the region were formed from the complex deposits of the most recent glaciation and are relatively young.

1.3.2 Topography, Bathymetry, Geomorphology

Most of the upland and freshwater portions of the study area consist of low, rolling hills with moderate slopes. Higher areas occur in the upper watershed of Sinclair Inlet to the west of Bremerton with some steep slopes (>50% slopes). The highest point is Green Mountain at about 1,500 feet. The most dramatic feature of the study area is the long marine shoreline of Puget Sound, formed by several inlets and many smaller bays.

Puget Sound itself is a large, fjord-like estuary where freshwater from numerous rivers mixes with saltwater from the Pacific Ocean. The Sound contains many sub-estuaries where larger rivers and small streams enter the Sound and create a mix of tidal freshwater, brackish, and salt marsh wetlands. As is typical of fjord-like estuaries elsewhere, Puget Sound is characterized by relatively deep basins that drop off steeply from a narrow fringe of shallow nearshore areas adjacent to the shoreline. Most of the Puget Sound shoreline in the study area has moderate to low banks, or areas with no appreciable bank – bays and estuaries, although higher, steep sloping bluffs occur along Port Washington Narrows.

Bremerton lies within the Central Basin of Puget Sound, which includes the area between the southern tip of Whidbey Island and Commencement Bay. The study area is relatively more sheltered and shallow than most of the Central Basin. Two small sub-basins occur in the study area: Dyes Inlet and Sinclair Inlet. The main basin of Dyes Inlet is deepest near the center, at about 150 feet, but the many bays are generally shallow (<35 feet). Sinclair Inlet is deepest at the eastern end (about 130 feet) while the head of the bay is <10 feet deep.

1.3.3 Hydrology

The East Kitsap Watershed lies between the backbones of the Kitsap Peninsula and Bainbridge Island, resulting in a narrow strip of land with many short streams that drain to the west side of Central Puget Sound. Streams in the study area are typical lowland type streams with generally moderate gradients. Upper reaches of streams are typical Puget Lowland headwater streams with low gradients that originate with perched groundwater in lakes and wetlands on upland plateaus and hills (Williams et al. 1975, Buffington et al. 2003).

Stream power is generally low, limiting the ability of streams to transport sediment. Where streams flow off the higher rolling hills and plateaus down to the shore of the Sound, steeper ravines can create confined channels with greater sediment transport capacity Due to the small size of most streams, large, extensive floodplains are not found in the study area.

The glacial deposits described above create a complex mix of layers of permeable deposits that rapidly infiltrate water (aquifers), with impermeable deposits such as compacted till, silts and clays that limit or prevent the infiltration of water (aquitards). As a result of this complex mix of deposits, the study area contains several aquifers and aquitards within the subsurface.. This mix of layers therefore controls subsurface water movement from the upland to the lowland, as well as water movement to the streams and creeks that occupy former glacial outwash channels (Deeter et al. 1979).Groundwater flow into Sinclair and Dyes Inlets has not been documented but is thought to be 'substantial' (Lincoln and Collias 1975, PSCRBT 1990).

1.3.4 Oceanographic Processes

The marine nearshore area of the study area is irregular and composed of numerous bays, harbors, and lagoons, with varied topography and slope. Combined, there are approximately 53 miles of marine shoreline in Shoreline Management Act (SMA) jurisdiction.

The protected nature of the marine waters means that tidal currents and flows are important in driving local circulation patterns and water exchange. Low tides expose numerous small to moderate-sized tide flats in the bays and at the head of the inlet. Currents are generally weak except for in the Port Washington Narrows (about 4 knots; NOAA 1988). Flushing time for marine waters is about four days. Tideflats at the head of the inlet are exposed during low tides. Currents in Sinclair Inlet are relatively weak – about 0.8 knots, resulting in a low flushing rate with an estimated flushing time of about 14 days. The low flushing rates in both Dyes and Sinclair Inlets means that contaminants entering the inlets are not flushed out but can remain in place and become concentrated, degrading water quality and habitat.

1.3.5 Sediment/Substrate

Streams in the study area are relatively small with moderate gradients and do not move large amounts of sediments compared to the larger river systems in Puget Sound. Steep slopes in the upper watersheds west of Gorst are moderately erosive and contribute sediment to floodplains, stream channels, and stream mouth estuaries (Map 3A and Map 4B). Tidal currents erode and deposit sediment in flats, marshes, and estuaries, creating complex channel networks. These channel networks redistribute organic matter, influence salinity gradients in estuaries, and provide access and refugia for fish and invertebrates.

The sediment that forms beaches and other shoreforms throughout Puget Sound, and in the study area, is predominantly from eroding coastal bluffs. Some areas of the steep coastal bluffs along Port Washington Narrows and in Bremerton East are highly erodible and are important sources contributing sediment to the nearshore (Figure 3-6). Sediment is eroded, moved, and deposited in a series of littoral drift cells. In areas where shorelines are protected from wave energy, streams entering the nearshore deposit fine sediments such as muds and sands. The large, relatively enclosed areas of Dyes Inlet and Sinclair Inlet has no appreciable net transport of sediment due to weak currents and limited wave action.

1.4 REASONABLY FORESEEABLE FUTURE DEVELOPMENT AND USE OF THE SHORELINE

1.4.1 Methodology

Description of foreseeable future development and use of the shoreline through:

- Projection of allowed uses, density, general character of uses and number of units provided by existing zoning on a buildout basis.
- Existing land use patterns affecting cultural and economic trends in response to the opportunities and constraints of the zoning.
- Projection of likely development within the affected area over a 20 year planning horizon based on OFM projections and the county's Comprehensive Plan.
- Projection of water-dependent, water oriented and non-water-dependent uses

These factors are discussed in more detail in Section 3.2.

1.4.2 General Trends

The 2011 estimate by the state Office of Fiscal Management (OFM) population of City of Bremerton was 37,729 persons. This compares with a 2010 Census population of 38,790. The OFM estimates 17,044 housing units, of which 9,071 are single family.

Population in Bremerton between 2000 and 2011 has varied from 37,259 in 2000 to as low as 34,580 in 2005. The City population has reflected general trends in Kitsap County population which is characterized by OFM as characterized by slow growth partly associated with the loss of one aircraft carrier and several support vessels at the Bremerton Naval Installation—resulting in a decline of approximately 2,000 "ashore" and "afloat" naval personnel. OFM projects that expected population growth in Kitsap County is subject to uncertainty due to transportation, military changes, and other issue.

OFM projects Kitsap County Growth over the 20 year period from 2010 to 2030 of about 9 percent.

Based on forecasts of population and employment growth, the City has determined that they will continue to plan for a six-year increment increase of 2,778 units and 9,300 jobs for the 2007 to 2012.

1.4.3 Shoreline Land Use Trends

The projection of land use trends on the shoreline includes the following conclusions:

- Most shoreline use will continue to be stable single-family residential neighborhoods.
- Relatively little change in shoreline conditions will result from new development, or redevelopment of existing sites.
- Very minor improvements will occur at a slow pace as individual properties undergo substantial remodeling or as docks and other over water structures reach the end of their life span and are replaced with new facilities that have relatively less impact. A more detailed assessment by watershed or marine area is included in Section 2.

1.5 BENEFICIAL EFFECTS OF ANY ESTABLISHED REGULATORY PROGRAMS UNDER OTHER LOCAL, STATE, AND FEDERAL LAWS

The beneficial effects of established regulatory programs consist of the following:

- Provisions of existing county land use and development regulations
- State and federal programs
- The beneficial effects of regulations in the SMP
- The beneficial effects of conservation and restoration programs

1.6 GENERAL CONCLUSIONS

This assessment is based on the description of existing ecological functions in the Inventory and Characterization prepared for the Shoreline Management Plan.

Relatively small areas of the Bremerton Shoreline are expected to redevelop over the near future. As they do there will be marginal improvements from the following provisions.

- No Net Loss Criteria: The single most stringent provision of the SMP is the no net loss criteria in SMP 20.16.630. This provision subjects all shoreline use, development, and re-development to a performance standard that all such activities prevent or mitigates adverse impacts to ensure no net loss of ecological functions and processes. This provides a performance standard that must be met in addition to any restriction or permission of a use and in addition to performance standards for individual uses of for shoreline modification.
- Restoration requirements for non-water-dependent uses. The Shoreline Management Act establishes a preference for water-dependent uses. Non-water-dependent uses SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Because most new development is not likely to be water-dependent, this provisions will ensure at least some improvement to ecological conditions from major projects.
- Native vegetation preservation on new lots and development is addressed in SMP 20.16.610 – Buffers and Setbacks, 20.16.620 – Vegetation Conservation, 20.16.650 – Water Quality, Stormwater, and Non-Point Pollution but has limited influence on the majority of lake shoreline which is already developed. Provisions for vegetation conservation for expansion or alteration of single family development in 20.16.620(2) will provide a minimal buffer but will have limited effect on ecological processes on an individual basis. Over the long term, education programs in conjunction with regulatory programs may lead to changes by land owners in how they maintain shoreline vegetation with beneficial consequences.
- Hard shoreline armoring in the form of rip-rap or concrete or wood structures are common throughout the Bremerton shoreline. Provisions encouraging softer solution to shoreline stabilization are provided in SMP 20.16.870. These provision, however, will apply only as existing structures fail or require major modification. It is unlikely that these provisions will lead to a substantial change in currently armored shorelines. These provisions, however, will prevent further degradation of relatively unaltered shorelines.
- Adverse impacts of inwater structures are addressed by SMP 20.16.820 Docks, Piers, and In-Water structures, 20.16.750 Marinas and Boating Facilities, and: 20.16.760

Recreational Development. These provisions contain specific performance standards that will reduce impacts. Existing in-water facilities will be gradually upgraded over time as they need to be replaced.

Overall, the combined results of the Shoreline Master Program (SMP) on properties immediately adjacent to shorelines, the Critical Areas regulations which address upstream conditions in watersheds not under SMP jurisdiction and a variety of restoration activities on shorelines and in watersheds is likely to result in no net loss of ecological functions on Bremerton shorelines and will likely result in improvement over time.

2. METHODOLOGY

The analysis of the cumulative effects of the Shoreline Management Program, together with other programs is summarized in Table 3-8. Matrix for Evaluation of Cumulative Effects of Shoreline Management Plan on Ecological Functions. This table considers the type of effects of a variety of human activities on a cross section of ecological functions and assesses the probable beneficial effects of:

- The Shoreline Management Program
- The Critical Areas Regulations adopted in December 2005.
- Other state and federal regulatory programs
- Non-regulatory enhancement efforts

This assessment is based on the description of ecological functions in the Inventory and Characterization prepared for the Shoreline Management Plan. The "landscape analysis" methodology used in that analysis analyses a number of processes that are important for aquatic resource management—hydrology, sediment, water quality (e.g., nutrients, pathogens, toxins/metals), organic matter, and heat/light. Because that analysis provides the basis of the assessment of cumulative effects, it is summarized below.

2.1 LANDSCAPE CHARACTERIZATION

The landscape characterization approach used in the Bremerton Shoreline Inventory and Characterization, September 2010 examines specific processes including the movement of water, sediment, nutrients, pathogens, toxicants, organic matter, and energy or heat that form and maintain the landscape over a large geographic scale. These processes interact with landscape features to create the structure and function of aquatic resources (Ecology 2005).

The analysis uses a coarse-grained approach for integrating landscape processes into shoreline management, restoration planning, and other land use planning efforts (Ecology 2005). The purposes of the analysis are to highlight the relationship between key processes and aquatic resource function and to describe the effects of land use on those key processes. This approach is not intended to quantify landscape processes and functions. Rather, the goal is to: 1) identify and map areas on the landscape important to processes that sustain shoreline resources; 2) determine their degree of alteration; and 3) identify the potential for protecting or restoring these areas.

2.1.1 General Framework and Conceptual Model

The watershed analysis approach attempts to answer four questions:

1. What are the key landscape processes that maintain aquatic/shoreline resources and their functions?
2. Which geographic areas within watersheds are most important for maintaining each key process?
3. How have human activities/land use altered important process areas and to what extent have the key processes been impaired?
4. Which areas have potential for sustaining or improving resource function through protection and/or restoration?

The processes that are most important for aquatic resource management are summarized below in Tables 2-1 and 2-2 (In the Inventory, Characterization, these are Tables 4-2 and 4-3)

Table 2-1. Maine Nearshore Processes, Process Important Areas, and Process Alterations

Process	Process Important Areas	Alterations
Freshwater Inputs	Streams and estuaries Contributing watershed for stream or shoreline Seepage zones in bluffs or banks	Changes in flow regime from dams, diversions, withdrawals, increased impervious areas (changed magnitudes, timing, frequency, duration) Increase in impervious area in watershed (increased peak flows, change in timing of peak flows) Stormwater outfalls in nearshore Constrictions of river flows or encroachment into estuary/delta (e.g., road crossings/culverts at river mouths, filling of floodplains and estuarine wetlands) Armoring or fill in nearshore that cuts off movement of groundwater into beach sediments
Tidal Flows	Rocky shores Beaches Stream deltas Estuaries and pocket estuaries (barrier estuaries) Barrier lagoons/marshes Open coastal inlets	Shoreline armoring/alteration of beach profile Tidal constrictions – tide gates, culverts, bridges, weirs Tidal encroachment – filling of tidal wetlands, dikes/levees, roads within tidal wetlands Increased impervious surfaces in watershed – increased flashiness/peak flows, higher river flows during winter (changes extent of tidal salt wedge intrusion into estuarine habitats and distribution of salt, brackish, and freshwater habitats)
Water Storage	Tidal and distributary channels Estuaries Coastal marshes	Tidal encroachment – filling of tidal wetlands, dikes/levees, loss of tidal channels, roads within tidal wetlands Shoreline armoring/alteration of estuarine/marsh profile Tidal constrictions – tide gates, culverts, bridges, weirs
Sediment Supply	Coastal bluffs Streams	Armoring of shorelines Dams Filling of estuaries, floodplains Tidal restrictions – dikes, tide gates, roads
Sediment Transport	Beaches in transport zones Estuaries (tidal and distributary channels)	Armoring, jetties/groins Fill in intertidal or upper shoreline Overwater structures (associated piers, pilings, seawalls) Tidal restrictions – dikes, tide gates, roads
Sediment Accretion & Deposition	Barrier beaches Stream deltas Estuaries and coastal marshes	Armoring
Habitat Formation – distributary and tidal channels	Estuaries Barrier lagoons/marshes Open Coastal inlets	Shoreline armoring/alteration of beach profile Tidal constrictions – tide gates, culverts, bridges, weirs Tidal encroachment – filling of tidal wetlands, dikes/levees, roads within tidal wetlands
Habitat Connectivity and Movement/Exchange of Organisms	Estuaries Beaches/bluffs Marine riparian vegetation	Fill in intertidal, estuaries, coastal marshes Shoreline armoring, jetties, groins Overwater structures, piers, pilings Impervious surfaces on bluffs; removal of riparian vegetation Tidal restrictions – tide gates, dikes/levees, culverts, road/railroad fill
Water Quality (nutrients, pathogens, toxins)	Land uses/land cover adjacent to surface waters discharging to marine shorelines	Removal of forest cover in contributing watershed Agricultural land uses – dairy, pasture, feed lots, manure sources Impervious surfaces and stormwater runoff from roads,

Table 2-1. Maine Nearshore Processes, Process Important Areas, and Process Alterations

Process	Process Important Areas	Alterations
	Wetlands adjacent to marine shorelines Semi-enclosed bays/heads of bays with low flushing rates Marine riparian vegetation	residential lawns Wildlife/domestic animal concentrations Failing septic systems Filling of wetlands adjacent to surface waters discharging to marine environment; Filling of wetlands adjacent to marine shorelines Removal of riparian vegetation Contaminated sediments; point discharges of toxins
Light Energy	Marine riparian Upper beach/shallow intertidal areas Eelgrass beds	Removal of riparian vegetation Shoreline armoring Overwater structures (docks, marinas) Nighttime lighting adjacent to shore (marinas, terminals, roadways)
Organic Imports/Exports, Carbon Cycling, LWD	Marine riparian Feeder bluffs Accretion shoreforms Estuaries and coastal marshes	Removal of riparian vegetation Removal of marsh vegetation Fill in coastal wetlands Shoreline armoring Constrictions in estuaries or pocket estuaries – presence of culverts, tide gates, bridges, or piers

Table 2-2. Freshwater process important areas and alterations.

Process	Important Areas	Alterations
Water Delivery	Forested uplands Vegetated uplands	Removal forest cover Impervious surfaces
Water Movement (infiltration/recharge, surface runoff, peak flows, groundwater flow/discharge)	Forested/vegetated uplands Channel migration zones Floodplains Aquifer recharge areas	Impervious surfaces Removal of forest cover Channel confinement Filling of floodplains Levees
Water Storage	Floodplains Wetlands Lakes	Levees Channel confinement Filling or draining wetlands, floodplains, or lakes
Water Loss	Lakes Vegetated areas/forest cover Deep groundwater flows	Removal of vegetation Impervious surfaces
Sediment Supply/Delivery	Steep slopes Bare ground/early seral stage vegetation Channel migration zones	Removal of vegetation cover/loss of forest vegetation Impervious surfaces Bank armoring
Sediment Transport	River/stream channels Floodplains Channel migration zones	Bank Armoring Dams
Sediment Storage	Floodplains Channel migration zones Lakes Wetlands	Filling of floodplains and wetlands
Channel Migration	Channel Migration Zone Floodplain	Channel confinement Bank armoring Fill in floodplain

		Altered flow regime (water diversion, dams, impervious surface)
Floodplain/hyporheic Connectivity	Floodplain Channel Migration Zone Forested Contributing Watershed	Channel incision Channel confinement Bank armoring Fill in floodplain Altered flow regime (water diversion, dams, impervious surface)
Habitat Connectivity and Movement/Exchange of Organisms	Streams/floodplains Riparian zones Channel migration zones	Dams Roads Culverts Channel confinement/levees Removal of vegetation/loss of native vegetation cover
Nutrient Management/Nitrogen and Phosphorous Retention and Cycling	Hyporheic zones/floodplains Lakes Wetlands Riparian zones	Removal of forest cover/riparian vegetation Channel confinement Filling or draining of wetlands
Pathogen and Toxin Removal/Processing	Hyporheic zones/floodplains Wetlands	
Carbon Cycling/Sequestration	Forested/vegetated uplands Vegetated riparian zones Soils/organic soils	
Organic Matter Export and Import/LWD	Steep slopes/landslide prone areas Riparian forests Floodplains/hyporheic zones Wetlands	Removal of vegetation/loss forest cover Channel confinement/levees Fill in floodplains and wetlands Bank armoring
Solar Incidence/Light Energy	Riparian forests Lakes Wetlands River channels	Removal of vegetation/loss of forests Loss of LWD Overwater structures Artificial nighttime light sources
Disturbance Regime	Steep slopes Channel migration zones Floodplains Forested contributing watersheds Riparian forests Wetlands	Removal of vegetation/loss forest cover Channel confinement/levees Bank armoring Fill in floodplains Alteration in flow regimes – water diversion, dams, impervious surfaces
Establishment Native Vegetation	Upland, wetland, and aquatic habitats Riparian zones	Alteration of water processes Alteration of sediment processes Removal of native vegetation Introduction of non-native vegetation Impervious surfaces Habitat fragmentation/loss of connectivity Increased inputs of nutrients, toxins
Establishment of Invasive Species	Disturbed or bare ground	Removal of vegetation cover/loss of forests Increased nutrient inputs Altered flow regimes Filling or draining wetlands Impervious surfaces

2.2 EXISTING CONDITIONS

Reference should be made to the City of Bremerton Inventory and Characterization Report for a detailed description of existing conditions.

2.3 REASONABLY FORESEEABLE FUTURE DEVELOPMENT

This section provides a general assessment of:

- General growth in population and employment projected to 2022.
- Shoreline use and development trends

2.3.1 General Population Trends

The State of Washington Office of Fiscal Management (OFM) identifies the military sector as the largest contributor to the economy of Kitsap County – specifically, the U.S. Navy. Naval facilities in the area include the Puget Sound Naval Shipyard (PSNS) in Bremerton, Naval Submarine Base (Bangor), and the Naval Undersea Warfare Engineering Station (Keyport).

Much of the private employment in the county is related to military activities. The United States Department of Defense actually employs more civilians in Kitsap County, than it does uniformed personnel. There are approximately 10,500 military personnel stationed throughout Kitsap County and nearly 13,000 civilians in its various military installations, the majority represented by the nearly 8,000 civilians working at the PSNS in downtown Bremerton. The defense-related economy in Kitsap

Most recently, there has been growth in the number of people who live locally but work in the Seattle area, using the state ferry system connecting Bremerton (and Winslow on Bainbridge Island) to downtown Seattle. With Bremerton's less diversified job market, yet lower cost of living, the "bedroom community" phenomenon is recognizable.

About 50% of the land in Bremerton is in residential zoning designations, with about 10 percent in commercial/industrial designations. There is about 9,240 acres of public lands, including federal lands (which overlaps land use designations).

Bremerton projects growth of an additional population of 13,000 by 2023 in a variety of single family and multi-family settings. The City projects that it has sufficient properly zoned land area to accommodate the additional residents projected by the Comprehensive Plan, but recognize a number of market constraints. Some of the constraints are regional or national economic conditions including availability of financing for new construction and home-ownership, weak "curb appeal" of available sites, availability of business-related financing, strength of the job market, etc. Other constrains relate to the willingness of owners to convert lands. Many oversized lots and other vacant infill sites are enjoyed by their owners for yard areas, additional off-street parking or RV storage, or to protect views and other amenities. These areas are not readily given up by many resident homeowners. Investors, however, may be more financially-inclined and willing to maximize the development potential of these properties.

2.3.2 Demand for Water Dependent Uses

The demand for water dependent use is affected by a wide variety of economic and social factors.

2.3.2.1 Historic Market Demand for Waterfront Areas

The historic need for industrial uses to have water access for ease and cost of transporting cargo and raw materials has undergone a transition in the past 30 to 50 years. In the past, central business districts and industrial areas in the Pacific Northwest tended to be collocated where rail and water transportation system linked. A number of trends have weakened the link between industrial centers and waterfronts, including globalization of manufacturing, off-shoring, containerization, telecommunications, the interstate highway system, and general improvements in the technology of transportation. At the same time the attraction of waterfronts for access and location of non-industrial uses including residential, tourism and recreation, as well as just being able to view water, of any kind, has grown. Market demand for any real estate is a complex set of factors generally influenced by demographic, economic and cultural preferences. An important dynamic of real estate markets is that once demand factors produce specific real estate development, it is resistant to change unless there are very strong market pressures that can overwhelm the costs and risks for redevelopment. (ECS 2008)

Industrial-commercial and other non-residential real estate or land uses tend primarily to be either location or price sensitive. Occasionally other non-economic factors influence the demand for industrial-commercial real estate. For instance, a business owner wanting to locate their firm close to their residence, their yacht or with views can overcome or influence the trade-offs between location and price sensitivity. Demand for these non-residential land uses is considered to be derived demand. Industrial-commercial land derives its value from how and what the land can be used for to generate income for businesses. The use of land to build shelter for households or facilities for recreation directly satisfies consumer demand. Private for-profit recreation businesses, including marinas are also the result of derived demand.

As a practical matter, the primary industrial-commercial land uses that are now water-dependent or water-related are those that still require transportation by ship, ship containers, barges, large outdoor facilities for processing, storing, lay-down assembling/manufacturing space and typically need easy and ready access to rail facilities for over land shipment of same and containers. Even uses long associated with waterfronts, such as fish-processing and small boat manufacture and repair can and do locate where land and buildings are cheaper, not necessarily on waterfront parcels. Water and waterfront areas for vessel moorage, haul-out, dry storage are among those that remain water-dependent uses.

2.3.2.2 Marine Cargo

Marine cargo use in the Puget Sound is dominated by the Port of Seattle and Tacoma Container Terminals. Both Seattle and Tacoma also have substantial bulk terminals for the movement of grain and products such as pulp and cement. The Ports of Olympia, Everett and Bellingham have almost no container cargo use but serve a variety of specialty materials such as pulp, wood products, cement and steel.

Bremerton has no significant marine cargo use on its shoreline.

There are not sufficient vacant or redevelopable shoreline areas currently available on the Bremerton shoreline to accommodate marine cargo.

2.3.2.3 Ship and Boat Building and Repair

Ship and Boat Building and Repair in the Puget Sound is concentrated in Seattle and Tacoma with smaller facilities in a variety of locations including Olympia, Everett, Bellingham, Port Townsend and Whidbey Island building smaller vessels and barges.

Ship building and repair in Bremerton is generally limited to the US Navy Puget Sound Shipyard which largely repairs navy ships. There are no private commercial boat builders in Bremerton.

There are limited sufficient vacant or redevelopable shoreline areas that could be available for non-federal boat building or repair currently available on the Bremerton shoreline. The area could likely accommodate small facilities, but may not be able to compete with other areas where support infrastructure is in place. If portions of the US Navy shipyard are underutilized in the future, portions of the site could be made available through the Enhanced Use Leasing (EUL) program to private use. Such a transfer of use, however, would not change the amount of the shoreline devoted to this use.

2.3.2.4 Commercial Moorage

Commercial Moorage in the Puget Sound is dominated by moorage for the fishing industry. The majority of fishing vessels home ported in Puget Sound are at commercial fishing ports located in Seattle, Bellingham Bay, and Blaine with smaller ports in Friday Harbor, Anacortes, La Conner, Everett, Tacoma, Olympia, and Shelton. (TRW 2008) About half of the fishing vessels in Puget Sound are oriented to the Alaska fishery. (BST 2007)

There is very little moorage devoted to fishing vessels in Bremerton. The lack of related facilities for servicing and repair will likely limit moorage to fishing vessels owned by residents of the Kitsap Peninsula who moor in the area for convenience. Those vessels moored in the area are largely accommodated by existing marinas.

2.3.2.5 Recreational moorage

Recreational moorage demand in Puget Sound has typically been characterized as a situation where demand is in excess of supply. The relative demand for in-water storage of vessels, however is also affected by the supply, convenience and cost of other alternatives, including self-launching of small boats and dry storage alternatives. The options for larger boats however are more limited since many large boats are impractical for self-launching or dry storage. Moorage space in the Puget Sound tends to lag behind the growth of vessel registrations and waiting lists are typical. Large boats, over 30’, can expect to wait 5-7 years smaller boats typically a year or more.

Bremerton currently has about many recreational moorage spaces and marinas. At the Port of Bremerton marina downtown, the supply of slips typically exceeds demands except at the peak summer boating season. This likely reflects current economic conditions rather than long term trends.

In the long term, the demand for marina space is likely to be related both to the total number of boats owned in the area as well as the cost of in-water moorage as it compares to self-launching and dry storage. It is likely that the most consistent demand in the future will be moorage for larger boat which have fewer alternatives and whose owners are likely to be more able to afford moorage, even if rates increase.

Moorage demand in Bremerton also is likely to be affected by the supply in neighboring communities nearby, such as Port Orchard, but also is affected by the willingness of owners to factor travel time into their choice of location.

The supply, convenience and cost of boat launches also affects the extent to which alternatives to moorage are available to smaller boats that are trailered and launched to the water as well as by hand launched small boats such as kayaks..

2.3.2.6 Boat Dry Storage

As an alternative to wet moorage use of dry storage facilities have been developed in a variety of locations including Edmonds, Everett, Port of Everett's Port Gardner Wharf, Lake Union in Seattle, the Thea Foss Waterway in Tacoma and at the Twin Bridges Marina near Anacortes,. Such facilities general accommodate boats of up to 30 feet in length.

Bremerton has no current dry storage facilities.

There are not limited vacant or redevelopable shoreline areas currently available on the Bremerton shoreline to accommodate this use. The most likely potential site is the industrial area in the vicinity of Pennsylvania Avenue.

2.3.2.7 Passenger Vessels

The passenger vessel market is divided between very large vessels and a variety of markets served by smaller vessels.

The large cruise ship market is differentiated between homeports and ports of call. A homeport refers to a vessel's home base when it is in a particular market area. Homeports are chosen for their ability to smoothly transfer passengers that fly-in or drive-in with the cruise ship. This generally requires a large local market with strong airport/highway capacity. For example, Vancouver B.C. and Seattle are the homeports for vessels in the Alaskan cruise market. A port of call is one of the ports that will be visited during a cruise itinerary or when the vessel is re-positioning from one market to another. Cruise vessels ports of call, for the Alaska market include Juneau, Ketchikan, Sitka, and other ports of call.

It is extremely unlikely that Bremerton would be able to compete with other large seaports for large cruise ships as either a homeport or a port of call.

There is also a fleet of smaller cruise ships that serves the Pacific Northwest market including the Victoria Clipper high speed service to Victoria and the San Juan Islands. Another example is the American West Steamboat Company operation of s two modern paddlewheel vessels, the Empress of the North and the Queen of the West. Both vessels are homeported in Portland. Empress of the North spends the summer plying Alaskan waters, before returning to Portland for the winter. Queen of the West spends the entire year operating on the Columbia, Snake and Willamette Rivers, and is joined on this route by the Empress of the North during the winter.

Charter Boats, Excursions and Dinner Boats are an additional sector of the passenger vessel market. Argosy Cruises has 11 vessels ranging in size from 35 to 280 lineal feet operating in Elliott Bay, the Ship Canal, Lake Union, and Lake Washington. They offer public and private sightseeing tours and host weddings, corporate events, and community activities. There also are a number of smaller specialty boats, including sailboat cruises. The Virginia V steam powered historic vessel is owned by a foundation and provides charter service.

It is possible that such services could be provided out of Bremerton, but they likely would use existing marinas rather than develop new facilities.

2.4 WATER-RELATED AND MIXED USES

The use of the terminology "mixed-use" differs substantially between the Shoreline Management Act (SMA) application and the general real estate market. The SMA usage refers to a mix of water-dependent and non-water-dependent uses. The real estate market usage refers to the mix of commercial, office and residential uses.

The typical real estate market characterization of mixed-use development in the Puget Sound area is some combination of residential over retail or office over retail in multi-storied buildings (vertical mixed-use). This type of mixed-use development has become common throughout much of the metropolitan region. There are some combinations that occur in single storied multi-use buildings called 'flex-tech' buildings. These buildings can contain horizontal mixes of uses including office, retail, restaurant, commercial, small assembly/service/storage, and showrooms. These 'flex-tech' types of buildings/uses tend to occur in business and office parks in suburban areas.

The growth in commercial space in the form of mixed-use is a response to the growth in employment in the finance, insurance, real estate, business, professional and medical-dental industries and the administrative offices of firm who are engaged in more industrial activities. One of the key determinants of where this type of vertical mixed-use locates is land values. Higher land values will support the vertical mixed-use type of development. Typically waterfront areas have higher land values.

Typically the mixed-use building developments have three components: office space with some retail or service to supplement office business; parking (surface, structured or underground) and whatever landscaping and amenities are typical for the market area or required by local regulations. This type of development can be accommodated into waterfront locations where communities value access to and views of the water or waterfront. In order to comply with the Shoreline Management Act and Shoreline Guidelines, public access and water-related uses can be included with little adverse effect on the economic viability of the development. There is potential for complementary use of project elements such as parking to serve water-related uses and public access in evenings and on weekends when office demand is reduced and most visitors or oriented to recreational use or amenities. (ECS 2008)

The Bremerton downtown waterfront has a large mixed use development incorporating the ferry terminal and intermodal center, the marina, and the navy ship as water –dependent uses. A large area of public open space provides water-enjoyment uses and as well as some restaurants with water views. The balance of the area includes hotels, office and other uses that relate to the amenities of the water. Residential development north of Burwell Street are oriented to amenities of the waterfront, including views, but have not water-dependent or water-oriented uses and are isolated from the water by a steep bluff. They do provide public access and views of the water by a trail at the top of the bluff.

Other locations in Bremerton for a mix of water-dependent and other uses are limited by topography and upland zoning. Most of the shoreline is designated for residential use, which provides little opportunity for water-dependent uses. Commercial areas along the water that provide some potential for a mix of water-dependent and other uses have a variety of limitations outlined below.

The small commercial area on Oyster Bay off Kitsap Way has upland zoning and a shoreline designation that would support water-dependent and other uses. The shallow character of Oyster Bay and its designation as an Aquatic Conservancy area are likely to substantially limit the potential for water-dependent uses.

The commercial area along Wheaton Way east of the Warren Avenue Bridge is largely located along a bluff that isolates the upland from shoreline frontage. Critical Area regulations designed to protect from landslides and protection of the feeder bluff likely preclude water access for most of this area. A small area along Campbell Way has existing commercial development adjacent to the water and may provide for a mix of water-dependent and other uses.

The commercial area at the head of Sinclair Inlet has zoning that would allow a mix of water-dependent and other uses; however the sensitivity of the Gorst Estuary likely would preclude water-dependent use at this location.

2.5 SHORELINE USE AND DEVELOPMENT TRENDS

Uses allowed in each of the Shoreline Areas (Shoreline Environmental Designations) are provided in the Shoreline Management Plan and provide the basis for future development trends. The projection of potential future use is also based on overview of the existing uses and probable market conditions.

The following section outlines presumed development trends in specific geographic areas.

2.5.1 Dyes Inlet

Dyes Inlet is the marine embayment of west Puget Sound which includes the northerly portion of the Bremerton Urban Growth Area (UGA).

The Dyes Inlet watersheds drain an area of 30,289 acres, including the creeks that flow into the inlet. It has approximately 22 miles of marine shoreline and 90 stream miles that include ten named streams. Approximately 40% of the watershed is within the urban area (12,231 acres) designated by Kitsap County. Within the study area, about 16 miles of marine shoreline with contributing drainage areas occur in Dyes Inlet. Bremerton and Silverdale are the major urban areas, with smaller retail centers at Chico, Tracyton, and Kitsap Lake. The Jackson Park Navel Reservation, Camp Wesley Harris, and parts of the Bangor Naval Reservation are located within the watershed.

Specific subareas considered in this analysis include:

- Ostrich Bay (with several subareas)
- Oyster Bay
- Mud Bay

Ostrich Bay

Ostrich Bay is a large embayment in Dyes Inlet. It supports coho, chum, and cutthroat. A concentration of surf smelt spawning areas is mapped around Elwood Point. Patchy eelgrass and salt marsh occur at a few scattered locations in Ostrich Bay. Bald eagle nests and foraging areas are associated with much of the Ostrich Bay shoreline

Land cover surrounding Ostrich Bay is a mix of high intensity residential, low intensity residential, mixed forest, evergreen and deciduous forest, urban grasses, and small areas of commercial/industrial. Land cover is mostly developed (66 to 80% developed) and impervious surface is relatively high; impervious surface is 30% or above over most of the contributing area.

Shoreline modifications include tidal barriers (3% of shoreline length), armoring (57% of shoreline area, roads (13% of shoreline area), and nearshore fill (2% of shoreline area).

Overwater structures are concentrated in a few locations and cover less than 1% of shoreline area.

Ostrich Bay North`

Ostrich Bay North includes the small embayment north of Elwood Point and Chico Bay. The area is outside of the City's planned annexation area but is important to ecological functions.

Chico Creek is the most important source of freshwater inputs to this area, and the entire west and south portion of Ostrich Bay.

The U.S. Navy and the public own the southerly portion of Chico Bay.

No change in land use is expected in this area. It is likely to remain a Rural Residential area under the Kitsap County Comprehensive Plan.

Ostrich Bay South

Ostrich Bay South includes the portion of the bay within the City. The primary land uses are the US Navy Hospital, the Navy Jackson Park residential community, the City's NAD Marine Park, and residential use.

Ostrich Bay Creek enters at the south end of the bay. It has a watershed area of about 450 acres in developed urban land uses. There is a pocket estuary at the delta of the stream. Fecal coliform bacteria levels in the stream have resulted in placement by the Kitsap Health District on a Public Advisory of waters that public should avoid contact with.

The majority of land use is single-family residential. Lots are moderate in size, there is relatively little potential for additional subdivision along the shoreline. It is presumed that the Navy will not change shoreline uses in their ownership and any future hospital expansion or residential development takes place in the upland outside of shoreline jurisdiction.

East Ostrich Bay

East Ostrich Bay include Madrona Point, the Marine Drive Point and the westerly portion of Rocky Point above Mud Bay. Rocky Point is currently outside of the Bremerton City limits but in the UGA. These areas are generally older residential developments with moderate to large lot sizes. A few lots are in the range of 3 to 5 acres.

Single-family land use in this area is not likely to change. There is some potential for subdivision of larger lots.

Oyster Bay

Oyster Bay is a shallow protected embayment with a relatively narrow opening to Ostrich Bay. Oyster Bay has no significant tributary streams. Oyster Bay has shallow habitat areas supporting high primary productivity and a diverse assemblage of habitat.

The majority of land in the bay is single-family residential with a small commercial area at the south end along Kitsap Way.

The commercial area near the south end of the bay has the potential for redevelopment in the future. It is unlikely to consist of water-dependent use given the shallow nature of the bay and the proposed "Aquatic Conservancy" designation. Future non-water-dependent or mixed-use development would require shoreline restoration and public access.

Redevelopment of the 83-acre Bay Vista site (the Bremerton Housing Authority Westpark Community) is likely to result in improved water quality discharge to Oyster Bay through application of current stormwater management practices, although the redevelopment area is only a part of the tributary watershed draining into the bay.

Mud Bay

The east side of Mud Bay is currently outside of the Bremerton city limits but in the UGA. It is surrounded by relatively large residential lots.

Single-family land use in this area is not likely to change. There is some potential for subdivision of larger lots when sewer service is extended to the area.

2.5.2 Port Washington Narrows

Port Washington Narrows is a tidal strait connecting Port Orchard Bay with Dyes Inlet. Tidal currents attain velocities in excess of 4 knots at times. The formal boundaries are Rocky Point to the northeast and Point Turner on the southwest side and Point Herron on the southeast side. For the purpose of this discussion, the Tracyton Beach area is formally within Dyes Inlet will be included in discussion of the east side of the Narrows.

Phinney Bay

Phinney Bay is a large embayment at the western end of Port Washington Narrows and eastern end of Dyes Inlet and extends from Rocky Point to N. Lafayette Avenue.

The eastern side of Phinney Bay (to Corbet Dr. NW) is currently outside of the Bremerton city limits but in the UGA. The primary land use is single family residential, but there is one marina, the Bremerton Yacht Club on the eastern shore.

Single-family land use in this area is not likely to change. Expansion of the marina would require evaluation of impacts and must meet no net loss criterion, which likely would require on-site and/or off-site mitigation.

Port Washington Narrows West

This area extends from N. Lafayette Avenue to Point Turner (which for convenience we will consider at 6th Street in downtown Bremerton.) This area has complex urban land uses including single-family and multi-family residential, industrial, and parkland including Evergreen Park. There is one marina.

Single-family land use in this area is not likely to change.

Expansion of the marina would require evaluation of impacts and must meet no net loss criterion, which likely would require on-site and/or off-site mitigation.

Redevelopment of the shoreline in the industrial area in the vicinity of Pennsylvania Avenue would be required to meet no net loss criterion, which likely would require on-site and/or off-site mitigation.

The multi-family area within the Downtown Subarea will be redeveloped with medium to high density residential with a strong relationship to the street. The high bank waterfront limits other than visual access to the water in most cases. Future non-water-dependent or mixed-use development would require shoreline restoration which like would include buffer augmentation with feeder bluff functions enhanced.

Port Washington Narrows East

The far northerly portion of Port Washington Narrows is characterized by large lot rural development in the area north of Sheridan Road which is in unincorporated Kitsap County and within the UGA. The balance of the reach is single-family, multi-family, commercial and park use. (For convenience, the area south of Manette Bridge on Point Herron is considered in the discussion of Port Orchard Bay.)

Single-family land use in this area is not likely to change. There is some potential for subdivision of larger lots when sewer service is extended to the area.

There are extensive areas of commercial and multi-family zoning in this reach which are likely to provide opportunities for enhancement of the shoreline upon redevelopment. The most extensive probable redevelopment area is the Bremerton Gardens multi-family community between Magnuson Way and 16th Street which will provide the opportunity for setbacks and buffers to allow feeder bluffs and adjacent areas to function more naturally. The commercial area along Campbell and Wheaton Way south of the Warren Avenue Bridge will likely redevelop incrementally. Because non-water-dependent development requires shoreline restoration and public access, buffer areas can be expected to be augmented and feeder bluff function enhanced.

2.5.3 Sinclair Inlet

Sinclair Inlet is the arm of Port Orchard Bay west of Port Washington Narrows. It includes the Bremerton Downtown, the US Navy Puget Sound Shipyard, Gorst Estuary and the City of Port Orchard on its south side.

Downtown Bremerton

The area from 6th Street to the Puget Sound Naval Shipyard within the Downtown Subarea will be redeveloped with an array of residential, office and mixed uses with strong connections and views to the waterfront. Most of this area has been redeveloped with only a few additional lots available. This area has high bluffs along the waterfront that precludes water-dependent use. Because non-water-dependent development requires shoreline restoration and public access, buffer areas are likely to be augmented and feeder bluff function enhanced.

Puget Sound Naval Shipyard

This reach is heavily modified by the development of the Naval Shipyard. There is unlikely to be a change in use of a substantial change in character.

<u>Restoration Strategy</u>

Restoration potential in this reach is limited due to intense development.

Future development in the downtown will preserve and enhance steep slopes resulting in augmentation of vegetation and feeder bluff function.

The major opportunity for enhancement is continuing efforts by the Navy to improve to water quality through improvements process water and runoff.

Gorst Estuary and Gorst Creek

Gorst Estuary is the largest estuary in the planning area and provides significant shoreline functions to Sinclair Inlet and Puget Sound. The estuary receives freshwater flows from Gorst Creek, as well as several small independent drainages nearby. Tributary streams support a variety a species including coho, chum, cutthroat, and steelhead.

Gorst estuary itself is shallow, with fringing marshes and mud flats that provide excellent production of prey for salmonids. Biological resources in the estuary include waterfowl concentrations at the mouth and along the north and south shorelines of Sinclair Inlet, and shorebird concentrations along the north shore.

The majority of the north side of the inlet is bounded by SR 2 and the U.S. Navy Railroad and is not expected to change.

There are extensive areas of commercial development generally south of Gorst Creek that are subject to redevelopment in the future. Because non-water-dependent development is likely, and such development requires shoreline restoration and public access, buffer areas are likely to be augmented.

On Gorst Creek, the commercially zoned area between the inlet and Sam Christopherson Road are low intensity and can expect to redevelop in the future and provide stream buffers and incorporate shoreline restoration as a non-water-dependent use.

Between Sam Christopherson Road and W. Belfair Valley Road the residential and urban restricted area can be expected more intensive future development and provide standard stream buffers.

2.5.4 Port Orchard Bay

Point Herron/Shore Drive

For purposes of this analysis, this reach extends from the Manette Bridge to the northeasterly end of shore Drive. The northerly end of this reach is occupied by the Boat House Restaurant and multi-family development. The balance of the reach is single family lots.

The single-family residences in this area are not likely to change in use, although some remodeling may occur.

The Boat House Restaurant is likely to retain its existing non-conforming status, even if other tenants occupy it. In the long term, the existing pier is likely to be reconstructed when it required major repair or replacement to include grading for light penetration and less surface coverage which will enhance nearshore ecological functions.

Port Orchard Bay East

The area east of Shore Drive in Bremerton is characterized by large single-family lots with extensive forested uplands.

The eastern part of this reach in the UGA is largely undeveloped within the UGA with development above the steep bluff that begins at the shoreline.

Single-family land use in this area is not likely to change. There is some potential for subdivision of larger lots when sewer service is extended to the area. The undeveloped shoreline in the eastern part of the reach is likely feature future development concentrated at the top of the slope due to the proposed Urban Conservancy designation.

2.5.5 Kitsap Lake

The Kitsap Lake shoreline is largely single-family residential, with numerous docks, large areas of modified shoreline, and very little riparian vegetation. There is a large publicly owned wetland on the south side of the lake, a City park, and a Navy park on the west side of the lake.

Single-family lots are relatively small and narrow with little potential for additional subdivision. No substantive change in public or Navy park or open space is expected.

2.5.6 Union River and Union River Reservoir

The Union River reservoir has a surface area of about 40 acres. Shoreline reaches include the entire lake shoreline, as well as the Union River below the reservoir from McKenna Falls to the lake. The combined lake and river shoreline area is approximately 98 acres. The upper

watershed and the reservoir are within the City's protected watershed area with deciduous, evergreen and mixed forest as the predominant land cover.

No change in use or status is expected.

2.5.7 Twin Lakes

Twin Lakes together are approximately 21.7 acres in size and lie within the City's utility area.

No change in use or status is expected.

3. ASSESSMENT OF CUMULATIVE EFFECTS

3.1 TYPICAL EFFECTS OF ALTERNATIONS ASSOCIATED WITH LAND USES

It is important to recognize that the ecological processes and functions that occur within Shoreline Management Act jurisdiction are affected by processes within the entire watershed, not only those that take place within shorelines regulated by the Shoreline Master Plan.

Tables 3-1, 3-2 and 3-3 provides a summary in matrix format for Lakes, Streams and Maine Environments of the types of cumulative effects produced by the processes and functions addressed in the landscape analysis and the extent to which the proposed revisions to the Shoreline Management Program addresses those potential effects.

3.1.1 Lakes

3.1.1.1 Hydrology

Hydrology typically effects surface runoff and peak flow and groundwater flow. It is substantially affected by upstream watersheds.

At the watershed level peak flows are affected by the watershed which size affects the structure and pattern of tributary discharge to the system. Larger systems with a greater geographical coverage tend to have tributaries that are affected differentially by precipitation patterns. The effect of single storm events on the system depends on the geographic extent of weather patterns. Natural lake systems experience high water levels in the winter and low water levels in the summer.

Groundwater/interflow includes interflow (shallow subsurface flow from shallow aquifers from precipitation that infiltrates into the soil surface and travels by means of gravity toward a lake or tributary stream). Interflow is often a substantial component of base flows in low-precipitation periods.

At both the watershed and the reach level, native vegetation influences the patterns by which precipitation reaches surface water. Vegetation cover affects the rate of runoff, infiltration, and the resistance of soils to erosion from a variety of sources. Each of these factors has an impact on stream morphology and stability. Native vegetation is adapted to regional weather, geologic, and soil conditions, as well as use as habitat by a variety of species and therefore will function as a complete system.

Sources of human disturbance include:

- Pervious surfaces such as lawns and pastures can substantially increase runoff as compared to native forests.
- Impervious surfaces related to roadways, driveways and parking areas tend to produce much higher peak runoff and much lower base flows and result in lower levels of infiltration and loss of low temperature interflows.
- Reduction in wetlands can decrease storage resulting in larger peak flows and less base flow into the lake system.

3.1.1.2 Water Quality

Water Quality includes temperature, nutrient sources, and chemical pollutants

At the watershed level in natural systems, water quality is maintained by a range of processes.

- Tree cover helps maintain cool water temperatures through provision of shade and creation of a cool and humid microclimate near the shore.
- Riparian vegetation adjacent to lakes and streams reduces nutrient and pollutants through a variety of processes that intercept, filter or biochemically immobilize substances.
- Wetlands have a variety of beneficial impacts on the nutrients and pollutants
  - Pollutants in the form of particulates are retained in a wetland with greater detention time.
  - Plants enhance sedimentation by acting like a filter and causing sediment particles to drop to the wetland surface
  - Wetlands uptake dissolved phosphorus and toxic compounds through adsorption to soil particles
  - Removal of nitrogen from the aquatic system (denitrification) is done by bacteria that live in the absence of oxygen.

The same mechanisms as outlined above for wetlands are present within SMP jurisdiction.

Sources of human disturbance include:

- Pervious surfaces such as lawns and pastures can substantially increase nutrients from fertilizers and pollutants and toxins through herbicides and pesticides. .
- Impervious surfaces related to roadways, driveways and parking areas tend to produce hydrocarbon pollutants and heavy metals.
- Loss of tree cover tends to reduce shade and increase water temperature and reduces or eliminates positive water-quality contributions.
- Loss or alternation of wetlands reduces functions reduces or eliminates positive water-quality contributions.

3.1.1.3 Aquatic Habitat

Aquatic habitat is addressed in terms of substrate structure and sediment size as well as factors such as adjacent upland vegetation, nearshore conditions and in-water structures.

At the watershed level, upstream changes in hydrology that increase erosion and result in sedimentation that changes the substrate structure of the nearshore. This is largely related to the proportion of native vegetation in a watershed and the amount of impervious surface. Forest cover tends to control rates of runoff that otherwise lead to excessive erosion and sedimentation. Natural systems tend to produce high quality water with moderate levels of nutrients and few or no toxins.

Interruption of natural sediment sources from dams or dredging of depositional areas such as deltas changes substrate supply. Structures may interrupt the longitudinal flow of sediment.

Upland vegetation helps maintain cool water temperatures through provision of shade and creation of a cool and humid microclimate in the nearshore.

Organic matter is important to the ecosystem in the form of leaves, branches, and terrestrial insects and is an important element of the food chain in streams and nearshore habitat in lakes.

At the reach level a wide variety of species depend on lake nearshore habitat for important life cycle functions. The nearshore is an especially productive area for a variety of insect and larvae food sources. A variety of species depend on specific nearshore substrate structure for spawning. Juvenile salmonids, particularly Chinook, rely on nearshore habitat during a critical rearing phase. Chinook use gently sloping, shallow shorelines for weeks to months. Deeper nearshore habitats with rocky substrates and without vegetation appear to be preferred by smallmouth and largemouth bass.

Sources of human disturbance include:

- Changes in sediment tend to alter substrate structure of the nearshore and make it less suitable for spawning, larvae production and a variety of habitat characteristics important to a range of species.
- Bulkheads may reflect wave action and create a high energy environment in the nearshore that mobilize fine sediments leaving the nearshore largely a gravel and cobble substrate unsuitable to many species and particularly inhospitable to juvenile Chinook.
- The loss of upland buffers through urbanization lead to a loss in shade and cooler temperature areas adjacent to streams and reduces the contribution of organic matter.
- Loss of upland vegetation and nearshore woody debris changes habitat conditions and may lead to less refuge and more predation, particularly for juvenile salmon.
- Docks and other inwater facilities contribute to providing habitat for some predators, particularly bass, and also may cause avoidance behavior in salmonids forcing them out of nearshore environments and into environments where food and shelter are less available and where predation is increased..

3.1.1.4 Terrestrial Habitat

Terrestrial habitat is affected by riparian vegetation, connectivity and special habitat features such as wetlands.

At the watershed level, continuity with habitat areas outside of the shoreline improves the productivity of habitat by providing links to larger areas and different types of riparian vegetation communities outside of the shoreline. The size of habitat areas is a primary factor in productivity, as well as complexity in habitat type.

At the reach level, the area width and continuity of vegetation as well as type and maturity are all important to wildlife habitat productivity. Larger wider riparian communities tend to have more complex vegetation communities and a wider variety of habitat types. Continuity links different types of riparian vegetation communities, and links a variety of upland areas which provides for access to greater habitat variety. A nearly continuous riparian zone is the typical natural condition in the Pacific Northwest. Wetlands adjacent to lakes also provide an important habitat niche for a variety of species, particularly amphibians.

Sources of human disturbance include:

- Reduction in the size or width of riparian community below the threshold to provide meaningful habitat. Fragmentation and isolation reduces the ability of wildlife to access otherwise productive habitat.
- Species that are sensitive to proximity impacts such as noise or light may not occupy otherwise suitable habitat.

- The isolation of prey species in small areas with limited ability for refuge may increase predatory efficiency such that a balance between predation and replacement may not be maintained. Domestic animals such as dogs and cats may increase the predator population beyond the natural balance.
- Loss of wetlands eliminates a habitat type important to the lifecycle of a variety of species.

3.1.2 Streams

3.1.2.1 Hydrology

Hydrology typically effects surface runoff and peak flow and groundwater flow. It is substantially affected by upstream watersheds.

At the watershed level peak flows are affected by the watershed which size affects the structure and pattern of tributary discharge to the system. Larger systems with a greater geographical coverage tend to have tributaries that are affected differentially by precipitation The effect of single storm events on the system depends on the geographic extent of weather patterns. Natural stream systems generally reach equilibrium in geomorphic processes that result in a stable bed and substrate.

Streamflow also includes interflow (shallow subsurface flow from shallow aquifers from precipitation that infiltrates into the soil surface and travels by means of gravity toward a stream). Interflow is often a substantial component of base flows in low-precipitation periods

On both the watershed and reach level, native vegetation influences the patterns by which precipitation reaches surface water. Vegetation cover affects the rate of runoff, infiltration, and the resistance of soils to erosion from a variety of sources. Each of these factors has an impact on stream morphology and stability. Native vegetation is adapted to regional weather, geologic, and soil conditions, as well as use as habitat by a variety of species and therefore will function as a complete system.

Sources of human disturbance include

- Pervious surfaces such as lawns and pastures can substantially increase runoff as compared to native forests. Impervious surfaces related to roadways, driveways and parking areas tend to produce much higher peak runoff and much lower base flows and result in higher erosion and sedimentation rates that affect substrate result in lower levels of infiltration and loss of low temperature interflows.
- Reduction in wetlands can decrease storage resulting in larger peak flows and less base flow into the system.

3.1.2.2 Water Quality

Water Quality includes temperature, nutrient sources, and chemical pollutants

At the watershed level in natural systems, streams serve as transport pathways for nutrients in both directions. They accumulate nutrients from groundwater and terrestrial sources and transport them downstream, during which time numerous chemical and biological interactions repeatedly cycle the nutrients between organic and inorganic forms. Nutrient balance in natural environments is a finely balanced and produces complex interactions with habitat for a variety of species. Natural systems tend to produce high quality water with moderate levels of nutrients and few or no toxins.

Water quality is maintained by a range of processes.

- Tree cover helps maintain cool water temperatures through provision of shade and creation of a cool and humid microclimate near the shore.
- Riparian vegetation adjacent to lakes and streams reduces nutrient and pollutants through a variety of processes that intercept, filter or biochemically immobilize substances.
- Wetlands have a variety of beneficial impacts on the nutrients and pollutants
  - Pollutants in the form of particulates are retained in a wetland with greater detention time.
  - Plants enhance sedimentation by acting like a filter and causing sediment particles to drop to the wetland surface
  - Wetlands uptake dissolved phosphorus and toxic compounds through adsorption to soil particles
  - Removal of nitrogen from the aquatic system (denitrification) is done by bacteria that live in the absence of oxygen.

The same mechanisms as outlined above for wetlands are present within SMP jurisdiction.

Sources of human disturbance include:

- Pervious surfaces such as lawns and pastures can substantially increase nutrients from fertilizers and pollutants and toxins through herbicides and pesticides. .
- Impervious surfaces related to roadways, driveways and parking areas tend to produce hydrocarbon pollutants and heavy metals.
- Loss of tree cover tends to reduce shade and increase water temperature and reduces or eliminates positive water-quality contributions.
- Loss or alternation of wetlands reduces functions reduces or eliminates positive water-quality contributions.

3.1.2.3 Aquatic Habitat

Aquatic habitat is addressed in terms of channel dynamics and stream structure, with includes substrate structure and pool structure as well as factors such as adjacent upland vegetation, woody debris and

At the watershed level, upstream changes in hydrology that increase erosion and result in sedimentation that changes the substrate structure of the nearshore. This is largely related to the proportion of native vegetation in a watershed and the amount of impervious surface.

Interruption of natural sediment sources from dams or dredging of depositional areas such as deltas changes substrate supply. Structures may interrupt the longitudinal flow of sediment.

At the reach level, the stream bottom substratum is critical habitat for a variety of species including food web species such as benthic macroinvertebrates. Substrate is critical for spawning for a variety of fish including salmon. Egg incubation and embryo development, is affected by substrate quality.

Large woody debris, (LWD) performs several critical functions in forested lowland streams, including dissipation of flow energy, protection of streambanks, stabilization of streambeds, storage of sediment, and providing in-stream cover and habitat diversity. Many fish species including salmon rear primarily in pools with high habitat complexity, with abundant cover.

Riparian vegetation helps maintain cool water temperatures through provision of shade and creation of a cool and humid microclimate over the stream.

Organic matter is important to the ecosystem in the form of leaves, branches, and terrestrial insects and is an important element of the food chain in streams and nearshore habitat in lakes.

Many species, including some species of salmon rely heavily on small lowland streams and associated off-channel wetland areas during their rearing phase.

Sources of human disturbance include:

- Stream channel morphology can be affected by shifts in the hydrologic regime due to increases in impervious surfaces, which changes the amount and patterns of runoff and streamflow. Higher flows generally lead to changes in channel character, higher stream erosion rates, increases in sedimentation, and disconnections from the floodplain with resulting loss of flood storage. In general, these changes compound each other in an urban environment.
- Streambed quality can be degraded by scour and erosion deposition of fine sediment, by streambed instability due to high flows. A higher proportion of fine sediment can lead to conditions in which spawning and egg incubation is reduced or precluded and production of macroinvertebrates is reduced.
- Changes in sediment can be affected by dams and stream armoring that limit the source of substrate and lead to downstream alteration of substrate structure.
- LWD in streams and resulting functions are reduced by clearing for agriculture or urban development. Absent or immature forests lack the potential for mature trees to fall and provide woody vegetation. Channel clearing and channelization removes LWD that may be present.
- Inwater structures such as dams may block or retard through increased velocity of movement of fish and other species along a stream. Docks and other inwater facilities contribute to providing habitat for some predators, particularly bass, and also may cause avoidance behavior forcing them into environments where food and shelter are less available and where predation is increased.

3.1.2.4 Terrestrial Habitat

Terrestrial habitat is affected by riparian vegetation, connectivity and special habitat features such as wetlands as discussed for lakes, above.

Streams, however, are much more prevalent in the landscape and provide corridors for movement of a variety of species and connect to a wider diversity of habitat types.

Sources of human disturbance include the same elements as outlined above for lakes.

3.1.3 Marine Environment

3.1.3.1 Freshwater Inputs and Tidal Flows

Freshwater inputs are most important in estuaries where water input and mixing create strong gradients in physical-chemical characteristics, biological activity and diversity, and the potential for major adverse impacts associated with human activities. Sources include streams estuaries as well as seepage zones in bluffs or banks.

Tidal flows move water, sediments, organisms/propagules, nutrients, and organic matter between the seaward limit of low tides and the landward limit of high tides. Tidal flows contribute to habitat formation, nutrient cycling, organic matter export, dispersal of organisms, species support (e.g., maintenance of salinity gradients) and connectivity. Local tidal flows are influenced by the regional tidal regime, local topography, and connectivity between marine/nearshore waters and shoreline or inland habitats.

Sources of human disturbance include:

- Changes in stream-flow regime from dams, diversions, withdrawals,
- Increased impervious areas changes the magnitudes, timing, frequency, and duration of freshwater inputs
- Encroachment into estuary/delta from road crossings/culverts at river mouths, filling of floodplains and estuarine wetlands
- Armoring or fill in nearshore that cuts off movement of groundwater into beach sediments
- Elimination of wetlands adjacent to marine shorelines that reduces storage and inputs of fresh water
- Tidal flows may be reduced by barriers such as tide gates, fill, culverts or road crossings

3.1.3.2 Light energy or solar incidence

Light entering both freshwater and marine nearshore environments is a key factor controlling biological processes such as primary production, the growth of plants, reproductive cycles of aquatic animals, and migratory movements and predator-prey interactions.

Shallow bays and inlets, estuaries, lagoons, and marshes have high productivity due to availability of light, as well as other factors. Eelgrass beds form narrow corridors where light penetration is limited by turbidity.

Kelp forest distribution is limited to areas with light penetration to the bottom as well as appropriate substrates, and moderate wave/current energy.

Algal production on the surface of tide flats is an important source of food for prey items of salmonids and other fish.

Light levels affect water temperatures that directly affect the growth and productivity of aquatic plants and the degree of desiccation and heat stress in upper beach areas which are important habitats for forage fish spawning.

Foraging success of juvenile fish (or their predators) depends on adequate light levels for locating and capturing prey.

Sources of human disturbance include:

- Decrease in daytime light levels due to artificial shading from docks and other inwater structures
- Increase in daytime light levels and heat/desiccation stress due to loss of natural shade from removal of riparian vegetation

- Increase in nighttime light levels due to artificial lighting from buildings, docks, marinas, or roadways affects a variety of movement patterns and predatory relationships.

3.1.3.3 Sediment/Substrate Structure

Sediment is a key structural constituent of many marine environments including:

- Beaches which provide energy dissipation, forage fish spawning, habitat formation, shellfish support, waterfowl foraging, eelgrass habitat, and juvenile salmon rearing and migration;
- Sand and mud flats which typically occur at mouths of rivers and streams where relatively large supplies of sediment are deposited; salt marshes and
- Brackish marshes that occur in areas with tidal inundation typically at elevations at and above MHHW;

Process intensive areas for supply include coastal bluffs and streams; for transport include streams and beaches in transport zones; for deposition include estuaries (tidal and distributary channels), barrier beaches; stream deltas

Coastal bluffs are the primary source of beach sediments in the Puget Sound, however many marine environments in Bremerton are primarily supplied by streams

Sources of human disturbance include:

- Changes in stream-flow regime impervious surfaces which increase instream erosion and increase the fine sediment component of beaches, estuaries and other depositional features
- Armoring of feeder bluffs which may remove sediment sources
- Nearshore structures such as jetties, groins, docks, dikes, and roads that limit the longitudinal movement of sediment.

3.1.3.4 Carbon Cycling/Water Quality

Nearshore and marine waters receive inputs of nutrients and organic matter from adjacent uplands, streams, rivers, and groundwater seeps and from deeper ocean waters via estuarine circulation and mixing, from nearshore bottom sediments.

Organic matter import and export provides the basis for detrital food webs, which are important elements of both freshwater and marine food webs Detrital food webs support many of the prey items salmonids rely on.

Process intensive areas include land uses/land cover adjacent to surface waters discharging to marine shorelines

Sources of human disturbance include a variety of uses that discharge materials into water including

- Agricultural land uses – dairy, pasture, feed lots, manure sources
- Impervious surfaces and stormwater runoff from roads, residential lawns
- Wildlife/domestic animal concentrations
- Failing septic systems
- Contaminated sediments; point discharges of toxins

Local features especially sensitive to inputs include numerous shallow, enclosed bays with low flushing rates, high shoreline to volume ratios.

Elimination of wetlands in tributary streams and adjacent to marine shorelines eliminates a natural feature that tends to reduce nutrients, pathogens and toxins. Removal of vegetation cover also eliminates natural processes that attenuate discharge of nutrients, pathogens and toxins.

3.1.3.5 Aquatic and Terrestrial Habitat

All of the processes previously discussed contribute to the presence and quality of aquatic and terrestrial habitat including:

This criteria relates to the presence of particular elements that indicate high quality aquatic habitat including:

- estuaries,
- barrier lagoons/marshes,
- brackish marshes,
- open coastal inlets,
- eelgrass beds
- kelp forests
- beaches
- upland wetlands
- adjacent marine riparian vegetation

The presence of these features are indicators of indicate high quality marine habitat.

Terrestrial habitat is affected by riparian vegetation, connectivity and special habitat features such as wetlands as discussed for lakes and streams, above.

3.2 EFFECTS OF CURRENT LOCAL REGULATORY PROGRAMS

3.2.1 Comprehensive Plan Urban Growth Areas

The City of Bremerton has designated urban growth areas in cooperative planning efforts with Kitsap County. The Growth Management Act encourages growth within urban growth areas and discourages growth outside them. The Urban Growth Boundary (UGB) divides urban areas with land that must remain rural. The policies in City of Bremerton for establishing urban growth boundaries include:

- The need to assure logical service boundaries,
- The need to avoid isolated pockets or abnormally irregular boundaries,
- Consideration of land needs analysis of residential, commercial and industrial needs within urban areas, and

3.2.2 Zoning

Zoning Regulations in City of Bremerton Code primarily address economic goals and compatibility with other human uses through a variety of mechanisms including:

Specifying zoning categories with a specific range of allowed uses, generally

Establishing density regulations, generally minimum lot sizes

Providing for development standards for specific features of development, including

- Setbacks
- Open space
- Landscaping
- Parking
- Stormwater

Zoning affect the intensity of urban uses and provides the context for many of the changes in functions of streams and shorelines but generally does not address shoreline issues directly (except in provisions relating to the Shoreline Master Program).

3.2.3 Critical Areas

The City of Bremerton has adopted Critical Areas Regulations affect lands outside of Shoreline Management Act jurisdiction and address:

- Geologically hazardous areas
- Frequently flooded areas
- Critical aquifer recharge areas
- Wetlands
- Habitat conservation areas, including streams and lakes and areas associated with priority species

Provisions in the regulations generally:

- Provide for the general prohibition of alteration in those critical areas with ecological importance such as wetlands, streams, lakes, marine shorelines, and wildlife habitat areas.
- Restrict the range of allowed uses.
- Provide for buffers to either protect human health and safety (in the case of Geological Hazards) or protect ecological functions.

3.2.4 Stormwater

Bremerton has approved use of the Stormwater Management Manual for Western Washington (SWMMWW), latest edition as the guiding criteria for the planning, design, and construction of stormwater facilities in Bremerton. The SWMMWW governs both public and private development projects within the City.

To apply surface water design standards and NPDES minimum requirements, all new development regardless of size may be subject to stormwater requirements issued by the City. Site regulation under surface water design includes creation or replacement of impervious

surfaces, flow control, and water quality. New developments that create more than 5,000 square feet of new impervious surface trigger drainage review including off-site analyses, erosion and runoff control, and conveyance system design. Runoff treatment for pollution generating impervious surfaces greater than 5,000 square feet includes biofiltration designed for the 2-year storm or an oversized wetpond if the project constructs more than one acre of pollution generating impervious surface.

The Peak Rate Flow Standard is the current flow control standard used by the City which detains runoff from a developed site based on single-event hydrologic modeling. NPDES standards require continuous hydrologic modeling to match flow durations between ½ of the two year flow up to the 50-year flow (City Council). To comply, the City requires projects generating more than .5 cubic feet per second (cfs) apply duration-based standards for detention facilities.

Duration standards seek to avoid potential disruption to the downstream channels by choosing a "threshold discharge," below which sediment transport in the receiving channel is presumed not to occur and so postdevelopment flow durations can be increased without concern. This choice can be made by site-specific, but rather expensive, analysis based on stream hydraulics and sediment size or can be applied as a "generic" standard based on predevelopment discharges.

An additional issue that remains with a duration standard is the threshold discharge below which there are "no effects" of flow-duration increase.

Problems with structural approaches to stormwater management include:

Point discharge – The consequences of converting a natural condition of dispersed overland flow into numerous headwaters into a point discharge at a surface-water outfall can result in locally severe erosion and disruption of riparian vegetation and instream habitat (e.g., Booth, 1990).

Groundwater – Flow durations control will not address changes to groundwater recharge or discharge, because no constructed detention ponds, even the largest designed under this standard, can delay wintertime rainfall sufficiently for it to become summertime discharge.

Individual storm hydrographs – There is no attempt (or ability) to construct detention ponds that match durations for specific storm events or even an entire storm season. Thus the aggregate flow-duration spectrum may be unchanged, but the timing and brevity of any single storm hydrograph may be quite different from the undisturbed condition (Booth 1997).

3.3 EFFECTS OF CURRENT FEDERAL AND STATE REGULATORY PROGRAMS

3.3.1 National Pollutant Discharge Elimination System (NPDES)

The federal Clean Water Act requires states to set standards for the protection of water quality. The mandate of the federal Clean Water Act is administered by the state Department of Ecology in conjunction with state water quality laws. The program regulates activities that result in wastewater discharges to surface water from industrial facilities or municipal wastewater treatment plants as well as non-point pollution. NPDES permits for stormwater discharges have two basic components. Stormwater discharge from construction sites are covered by a Statewide General Permit and require compliance for clearing of sites of five or more acres. NPDES permit requirements for municipal stormwater systems are being phased in with the first phase affecting jurisdictions that serve populations of 100,000 or more.

3.3.2 Section 404 Permit

The federal Clean Water Act also regulates excavation and dredging in waters of the U.S., including wetlands. Certain activities in Waters of the United States, including wetlands and streams may require a permit from the U.S. Army Corps of Engineers. This requirement is administered by the Corps in conjunction with Section 10 of the Rivers and Harbors Act. As part of the program, the Washington State Department of Ecology is required to certify compliance with water quality standards under Section 401 of the CWA.

3.3.3 Endangered Species Act

The federal ESA addresses the protection and recovery of federally threatened and endangered listed species. The ESA is jointly administered by the National Marine Fisheries Service (NMFS) and the United States Fish and Wildlife Service (USFWS). Specific programs developed or under development in cooperation with the U.S. Army Corps of Engineers include design standards for docks contained in the USACE Regional Permit No. 3 that apply to Kitsap Lake and proposed restrictions on shoreline protection included in a Biological Opinion dated December 13, 2007 (NMFS 2007). Other programs with potential impacts on Bremerton include the NMFS Biological Opinions on flood control facilities issued September 22, 2008 and addressing certain pesticides issued April 20, 2009. These programs will affect issuance of federal permits, most notably Section 404 Permits.

3.3.4 Washington State Department of Ecology

Ecology has regulatory authority over a wide variety of programs that affect water quantity and quality through the on waters of the state. Some of these programs include:

- Water Pollution Control RCW 90.48 RCW.
- Water pollution control facilities financing RCW 70.146
- Underground petroleum storage tanks RCW 70.148
- Hazardous materials RCW 70.136
- Radioactive waste RCW 70.99
- Hazardous waste management RCW 70.105
- Hazardous waste fees 70.105A
- Hazardous waste cleanup, Model toxics control act RCW 70.105D
- Mixed radioactive and hazardous waste. RCW 70.105E
- Detergent phosphorus content. RCW 70.95L
- Water Rights RCW 90.03-44
- Shoreline management act of 1971 RCW 90.58
- Dairy nutrient management RCW 90.64
- Underground storage tanks RCW 90.76
- Watershed planning RCW 90.82

Many of these programs are administered in coordination to provide multiple benefits, including coordination with the Shoreline Management Act.

3.3.5 Washington State Department of Agriculture

Agriculture has regulatory authority over programs that address water quantity impacts of agricultural practices limited to:

- The Dairy Nutrient Management Act of 1998 (RCW 90.64),
- The Concentrated Animal Feeding Operation (CAFO) permit administered by ecology

WDA provides technical support to Ecology through inspection and technical support. The Concentrated Animal Feeding Operation (CAFO) permit is a delegation of authority to Ecology by the federal Environmental Protection Agency under the federal Clean Water Act National Pollutant Discharge Elimination System (NPDES) Program.

Both of these programs are administered in coordination with Ecology and the local Conservation District.

3.3.6 Hydraulic Project Approval (HPA)

The Washington Department of Fish and Wildlife (WDFW) regulates activities that use, divert, obstruct, or change the natural flow of the beds or banks of waters of the state and may affect fish habitat. Projects in the shoreline jurisdiction requiring construction below the ordinary high water mark of Puget Sound or streams in the City could require an HPA from WDFW. Projects creating new impervious surface that could substantially increase stormwater runoff to waters of the state may also require approval.

3.4 ENHANCEMENT PROGRAMS

3.4.1 Salmon Recovery: East Kitsap Peninsula WRIA 15

The planning area for the East Kitsap Peninsula Salmon Habitat Restoration Strategy is the eastern portion of Water Resource Inventory Area (WRIA) 15 that drains toward central Puget Sound, with the exception of Vashon Island. This area includes the streams, nearshore and marine waters of the east side of the Kitsap Peninsula, the Key Peninsula, the Gig Harbor Peninsula; and Fox, McNeil, Anderson and Bainbridge Islands.

Strategy is described in Chapter 6 of the Draft Puget Sound Salmon Recovery Plan as follows:

The mission of the East Kitsap Lead Entity (LE) is to ensure local salmon habitat is preserved and restored to support salmon populations and human communities. The goal of this strategy is to restore healthy self-sustaining wild populations of the salmon species native to the streams and shorelines of the Kitsap Peninsula.

Four objectives include:

- Increase population levels
- Maintain geographically diverse populations
- Promote the preservation and restoration of healthy, functioning ecosystems
- Increase public understanding and support for salmon recovery

This strategy addresses local habitat conditions and is therefore an integral part of the larger regional recovery effort.

A complete list of near term salmon recovery programs is available at: http://www.sharedsalmonstrategy.org/RecoveryPlan.htm

3.4.2 Puget Sound Partnership (PSP)

In response to the challenges facing the Sound, in 2007 the Legislature created the Puget Sound Partnership to reverse Puget Sound's decline and restore it to health by 2020. This agency replaced the Puget Sound Action Team created in 1996, to protect and restore Puget Sound and its spectacular diversity of life now and for future generations. The Partnership has developed the following priorities in its Action Plan:

Priority A: Protect the intact ecosystem processes, structures, and functions that sustain Puget Sound. Avoiding problems before they occur is the best and most cost-effective approach to ecosystem health.

Priority B: Restore the ecosystem processes, structures, and functions that sustain Puget Sound. Protecting what we have left is not sufficient, and significant effort at an unprecedented scale is needed to undo past damage.

Priority C: Prevent water pollution at its source. Many of our efforts have focused on cleaning up degraded waters and sediments, but insufficient resources have been devoted to stopping pollutants before they reach our rivers, beaches, and species.

Priority D: Work together as a coordinated system to ensure that activities and funding are focused on the most urgent and important problems facing the region. Many of the programs and laws now used to regulate or support activities in Puget Sound were established on a piecemeal basis to address individual problems. Strategies that will help to address problems more effectively at an ecosystem scale include improved coordination of land use planning, water supply, ecosystem protection, transportation, and species recovery plans. The Action Agenda calls for the reform of environmental regulatory programs as well as improvements to the capacity of local partners to implement actions and compliance efforts across Puget Sound.

Priority E: Build an implementation, monitoring, and accountability management system.

3.4.3 Washington Department of Natural Resources

The Washington State Department of Natural Resources (DNR) manages state lands including forests, farms, commercial properties and underwater lands under state ownership. Much of this land is dedicated to supporting trusts for specific public institutions like schools and universities.

DNR's aquatic lands are managed to provide access to the waters of the state - rivers, lakes, streams and Puget Sound. DNR also works to serve the continuation of navigation and commerce. Aquatic lands in Kitsap Lake include all lands beyond the inner harbor line. DNR issues leases for uses within harbor lands, including permits for docks and other over-water structures that extend beyond the Inner Harbor Line.

3.4.4 WDFW

The Washington Department of Fish and Wildlife is a state leader in providing technical support staff as well as funding to salmon recovery efforts. A complete list of WDFW's activities is available at their website at http://www.wdfw.wa.gov.

3.5 EFFECTS OF PROPOSED BREMERTON SHORELINE MASTER PROGRAM

Effects of the proposed program are related to both specific bulk regulations and dimensional standards for buffers, setbacks, and other features as well as performance standards for specific uses.

No Net Loss Criteria: The single most stringent provision of the SMP is the no net loss criteria in SMP 20.16.630. This provision subjects all shoreline use, development, and re-development to a performance standard that all such activities prevent or mitigates adverse impacts to ensure no net loss of ecological functions and processes. This provides a performance standard that must be met in addition to any restriction or permission of a use and in addition to performance standards for individual uses of for shoreline modification.

Provisions for Non-Water-Dependent Uses: The shoreline management act establishes a priority for water-dependent uses. Non-single-family uses that are not water dependent must, in effect, earn their way onto the shoreline by providing a net benefit to the public through ecological restoration and public access. The provisions that implement this requirements for commercial and industrial uses are found in SMP 20.16.720.b.5, and 20.16.740.b.4. Since most expected development within shoreline jurisdiction are expected to be non-water-dependent uses, it is likely that improvements in shoreline ecological functions will be incorporated in most non-single family projects. In most cases, this is likely to include on site improvements such as provision or enhancement of buffers, but also may include off-site restoration in some cases.

Dimensional Standards: The dimensional standards provide predictable elements that would be associated with specific shoreline environment designation. The provisions that have the most impact on ecological functions include the provisions of SMP 20.16.610 which provide building setbacks and buffers. These provisions are reproduced below.

DESIGNATION	Minimum Building Setback	Buffer Width Standard
URBAN CONSERVANCY	15 feet beyond buffer	175 feet
SINGLE FAMILY & MULTI FAMILY RESIDENTIAL		
Lot depth less than 125'	5 feet beyond buffer	20% of lot depth
Lot depth 125' to 199''	10 feet beyond buffer	20% of lot depth
Lot depth greater than 200'	15 feet beyond buffer	30% of lot depth (Maximum of 100')
RECREATIONAL	15 feet beyond buffer	100 feet
COMMERCIAL / INDUSTRIAL / DOWNTOWN WATERFRONT	15 feet beyond buffer	50 feet
ISOLATED	None	None

Please note: For all designations, setbacks and buffers listed above the following shall apply:
(1) Where buffers/setbacks for other critical areas are required, the most stringent buffer/setback shall be applied.
(2) Where lot depth is less than 150 feet on Commercial or Recreational lots, the buffers listed above may be reduced to 20% of the lot depth.
(3) In no case shall a buffer be greater than 200'.

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These provisions, however do not apply to water dependent elements of a development which necessarily must include elements at the land-water interface or on or over the water.

These buffer area primarily affect the following ecological functions on lakes, streams and marine shorelines.

Vegetation Conservation: These provisions are addressed in SMP 20.16.620 and generally serve to protect, conserve and establish native vegetation nears shorelines in order to protect

and restore the ecological functions and ecosystem wide processes performed within riparian and near shore areas which include but are not limited to:

- Protecting plant and animal species and their habitats;
- Providing food sources for aquatic and terrestrial species in the form of various insects and benthic macro invertebrates;
- Providing shade necessary to maintain water temperatures for salmonids, forage fish, and other aquatic biota;
- Protecting and increasing stability of banks and bluffs;
- Reducing the hazard of slope failures or accelerated erosion;
- Reducing the need for structural shoreline stabilization measures;
- Improving the visual and aesthetic qualities of the shoreline;
- Protecting and improving water quality through filtration and vegetative uptake of nutrients and pollutants;
- Providing habitat corridors parallel and perpendicular to the water body.

These provisions are implemented though requirements for Vegetation Conservation Plans for new development of major alteration or expansion of existing development.

Vegetation conservation provisions will have limited effect on existing of single family development which is the predominant use in the shoreline and has highly variable conditions. In general, however, the higher density single family areas have the least buffer and generally are characterized by lawn or ornamental vegetation that extends to or close to the edge of the water. Provisions in SMP 20.16.620(2) will provide a minimal buffer that will have positive influence on water quality by avoiding application of chemicals such as fertilizers, herbicides and pesticides close to the water where overspray occurs. Such buffers also will have some, but limited positive contribution of filtering and reducing by uptake nutrients and toxins in overland runoff. The narrow width and the lack of provision of trees will not have a discernible effect on microclimate, shading and the temperature and potential desiccation of freshwater or marine shorelines. Over time, however, these provisions and public education could lead to a substantial number of residential lots and other development incorporating buffers that will primarily reduce overland discharge of herbicides and pesticides from lawn.

Shoreline Sediment Processes: Alteration of in-stream and marine recruitment processes, transport and deposition in streams or as marine nearshore substrate will be benefitted by provisions in SMP 20.16.870 Shoreline Stabilization, 20.16.810 Clearing and Grading, 20.16.830 Dredging, 20.16.850 Landfills, all of which encourage preservation of natural processes. In cases where natural processes have been altered, some replacement of hard armoring may occur on a case by case basis, which may improve some natural functions of recruitment and transport of sediment. This replacement is likely to occur, however, when existing hard armoring fails. In most cases where hard armoring is present in areas where softer solutions would be appropriate, the existing armoring will not be subject to failure and will persist. Where hard armoring fails because of natural processes, conditions are less likely to be conducive to softer solutions.

Inwater Structures: Adverse impacts of shading due to inwater structures is addressed by SMP 20.16.820 Docks, Piers, and In-water Structures, 20.16.750 Marinas and Boating Facilities, and: 20.16.760 Recreational Development which contain specific performance

standards that will reduce impacts of shading and barriers to fish movement. Existing in-water facilities will be gradually upgraded over time as they need to be replaced.

3.6 MATRIX SUMMARY OF CUMULATIVE EFFECTS

The matrices in Tables 3-1. 3-2 and 3-3 address lakes, streams and the marine shoreline, respectively and provide a more detailed assessment of potential cumulative effects of development and the extent to which the beneficial impacts of the proposed Shoreline Management Plan and other programs result in probable ecological change.

3.7 REFERENCES

See

City of Bremerton, Shoreline Master Program, Revised Shoreline Inventory and Analysis. Prepared by Parametrix, Bellevue, Washington. September 2010. Prepared by Parametrix Inc . December 2010

http://www.ci.bremerton.wa.us/forms/communitydev/smp/ShorelineInventory_Analysis.pdf

Additional References

BST Associates, 2007 Bellingham Waterfront Lands Analysis Final Report Prepared for Port of Bellingham, Bellingham, WA January 23, 2007
http://www.cob.org/documents/planning/newwhatcom/2007-03-22-ind-land-supply.pdf

BST Associates, 2007 Everett Waterfront Lands Analysis 2007. Update Dated April 9, 2007 Clarification of BST Conclusions by Planning Staff
http://www.everettwa.org/Get_PDF.aspx?pdfID=626

Shorett, Peter K 2006 Rent Market Study Port of Port Townsend Boat Haven Port Townsend, Washington as of April 10, 2006. Prepared for Port of Port Townsend http://www.portofpt.com/BHRentSurvey-Final.pdf

Economic Consulting Services 2008 City of Renton, Shoreline Management Program Update: Economic Market for Shorelines Uses – Water Dependent Uses October 15, 2008 http://rentonwa.gov/uploadedFiles/Business/EDNSP/planning/Tech%20Memo%20Demand%20Shoreline%20Dependent%20%2010-15-08.pdf

Property Counselors 2009 Seattle Shoreline Master Program Update, Comparison of Land Supply and Demand for Water-Dependent and Water-Related Uses. Prepared for the City of Seattle Department of Plannning and Development. December 2009
http://www.seattle.gov/dpd/cms/groups/pan/@pan/@plan/@shorelinemasterprog/documents/web_informational/dpdp018454.pdf

Table 3-1. Lakes - Matrix by Reach for Evaluation of Cumulative Effects of Shoreline Management Plan on Ecological Productivity

Lake Environments					
Indicators	**Hydrology**	**Water Quality**	**Aquatic Habitat/Substrate**	**Aquatic Habitat/Organic matter**	**Terrestrial Habitat**
Processes and Functions	**Watershed Level:** Peak Flows: The watershed size affects the structure and pattern of tributary discharge to the system. Larger systems with a greater geographical coverage tend to have tributaries that are affected differentially by precipitation patterns. The effect of single storm events on the system depends on the geographic extent of weather patterns. Natural lake systems experience high water levels in the winter and low water levels in the summer. Groundwater/Interflow: Water input includes interflow (shallow subsurface flow from shallow aquifers from precipitation that infiltrates into the soil surface and travels by means of gravity toward a lake or tributary stream). Interflow is often a substantial component of base flows in low-precipitation periods **Reach Level:** Native vegetation influences the patterns by which precipitation reaches surface water. Vegetation cover affects the rate of runoff, infiltration, and the resistance of soils to erosion from a variety of sources. Each of these factors has an impact on stream morphology and stability. Native vegetation is adapted to regional weather, geologic, and soil conditions, as well as use as habitat by a variety of species and therefore will function as a complete system. Sources of human disturbance include: Pervious surfaces such as lawns and pastures can substantially increase runoff as compared to native forests. Impervious surfaces related to roadways, driveways and parking areas tend to produce much higher peak runoff and much lower base flows and result in lower levels of infiltration and loss of low temperature interflows. Reduction in wetlands can decrease storage resulting in larger peak flows and less base flow into the lake system.	**Watershed Level:** In natural systems, water quality is maintained by a range of processes. Tree cover helps maintain cool water temperatures through provision of shade and creation of a cool and humid microclimate near the shore. Riparian vegetation adjacent to lakes and streams reduces nutrient and pollutants through a variety of processes that intercept, filter or biochemically immobilize substances. Wetlands have a variety of beneficial impacts on the nutrients and pollutants • Pollutants in the form of particulates are retained in a wetland with greater detention time. • Plants enhance sedimentation by acting like a filter and causing sediment particles to drop to the wetland surface • Wetlands uptake dissolved phosphorus and toxic compounds through adsorption to soil particles • Removal of nitrogen from the aquatic system (denitrification) is done by bacteria that live in the absence of oxygen. **Reach Level:** The same mechanisms as outlined above for wetlands are present within SMP jurisdiction. Riparian vegetation reduces nutrient and pollutants through a variety of processes. Wetlands on or near lakes have similar beneficial impacts on the nutrients and pollutants as on a watershed level. Sources of human disturbance include: Pervious surfaces such as lawns and pastures can substantially increase nutrients from fertilizers and pollutants and toxins through herbicides and pesticides. . Impervious surfaces related to roadways, driveways and parking areas tend to produce hydrocarbon pollutants and heavy metals. Loss of tree cover tends to reduce shade and	**Watershed Level:** Upstream changes in hydrology that increase erosion and result in sedimentation that changes the substrate structure of the nearshore. This is largely related to the proportion of native vegetation in a watershed and the amount of impervious surface. Forest cover tends to control rates of runoff that otherwise lead to excessive erosion and sedimentation. Natural systems tend to produce high quality water with moderate levels of nutrients and few or no toxins. Interruption of natural sediment sources from dams or dredging of depositional areas such as deltas changes substrate supply. Structures may interrupt the longitudinal flow of sediment. **Reach Level:** A wide variety of species depend on lake nearshore habitat for important life cycle functions. The nearshore is an especially productive area for a variety of insect and larvae food sources. A variety of species depend on specific nearshore substrate structure for spawning. Juvenile salmonids, particularly Chinook, rely on nearshore habitat during a critical rearing phase. Chinook use gently sloping, shallow shorelines for weeks to months. Sources of human disturbance include: Changes in sediment tend to alter the substrate structure of the nearshore and makes it less suitable for spawning, larvae production and a variety of habitat characteristics important to a range of species. Bulkheads may reflect wave action and create a high energy environment in the nearshore that mobilize fine sediments leaving the nearshore largely a gravel and cobble substrate unsuitable to many species and particularly inhospitable to juvenile Chinook.	**Reach Level:** Upland vegetation helps maintain cool water temperatures through provision of shade and creation of a cool and humid microclimate in the nearshore. Organic matter is important to the ecosystem in the form of leaves, branches, and terrestrial insects and is an important element of the food chain in streams and nearshore habitat in lakes. Nearshore environments are important to many species. The nearshore is especially critical to the small fry stage of Chinook salmon. They remain in very shallow water along the lake's shorelines and prefer gently sloping sand to gravel with some overhanging or submerged vegetation or fine woody debris that provides cover from avian or fish predators. Deeper nearshore habitats with rocky substrates and without vegetation appear to be preferred by smallmouth and largemouth bass. Sources of human disturbance include: The loss of upland buffers through urbanization lead to a loss in shade and cooler temperature areas adjacent to streams and reduces the contribution of organic matter. Loss of upland vegetation and nearshore woody debris changes habitat conditions and may lead to less refuge and more predation, particularly for juvenile salmon. Docks and other inwater facilities contribute to providing habitat for some predators, particularly bass, and also may cause avoidance behavior in salmonids forcing them out of nearshore environments and into environments where food and shelter are less available and where predation is increased..	**Watershed Level:** Continuity with habitat areas outside of the shoreline improves the productivity of habitat by providing links to larger areas and different types of riparian vegetation communities outside of the shoreline. The size of habitat areas is a primary factor in productivity, as well as complexity in habitat type. **Reach Level:** Area, width and continuity are all important to wildlife habitat productivity. Larger wider riparian communities tend to have more complex vegetation communities and a wider variety of habitat types. Continuity links different types of riparian vegetation communities, and links a variety of upland areas which provides for access to greater habitat variety. A nearly continuous riparian zone is the typical natural condition in the Pacific Northwest. Wetlands adjacent to lakes also provide an important habitat niche for a variety of species, particularly amphibians. Sources of human disturbance include: Reduction in the size or width of riparian community below the threshold to provide meaningful habitat. Fragmentation and isolation reduces the ability of wildlife to access otherwise productive habitat. Species that are sensitive to proximity impacts such as noise or light may not occupy otherwise suitable habitat. The isolation of prey species in small areas with limited ability for refuge may increase predatory efficiency such that a balance between predation and replacement may not be maintained. Domestic animals such as dogs and cats may increase the predator population beyond the natural balance. Loss of wetlands eliminates a habitat type important to the lifecycle of a variety of species.

Lake Environments					
Indicators	**Hydrology**	**Water Quality**	**Aquatic Habitat/Substrate**	**Aquatic Habitat/Organic matter**	**Terrestrial Habitat**
		increase water temperature. Loss or alternation of wetlands reduces functions reduces or eliminates positive water-quality contributions.			
Effects of Programs	**Watershed Level:** <u>Peak Flows:</u> City and Kitsap County land use regulations primarily affect watershed vegetation and impervious surface and runoff patterns through zoning, and density regulations. The extent of large lot forest or rural zoning in a watershed is the primary factor that preserves native vegetation and preserved natural hydrology. City and county Critical Areas (CA) regulations for wetlands, and Fish and Wildlife Conservation Areas (FWCA) preserve some land through buffers, but do not affect enough land area to affect the runoff patterns resulting from removal of native forests. City and county stormwater regulations have a substantial effect on peak runoff for new development, but the majority of existing impervious surface is not affected <u>Groundwater/Interflow:</u> City and Kitsap County land use regulations affecting watershed vegetation and impervious surface are the primary factors affecting infiltration to the shallow aquifer and from there into tributary streams or directly into lakes. The extent of large lot forest or rural zoning in watersheds affects the scale of interflow. City and county stormwater regulations provide some incentives for infiltration, but do not affect the majority of largely developed land uses in watersheds. **Reach Level:** Native vegetation preservation on new lots and development is addressed in SMP 20.16.610 – Buffers and Setbacks, 20.16.620 – Vegetation Conservation, 20.16.650 – Water Quality, Stormwater, and Non-Point Pollution but has limited influence on the majority of lake shoreline which is already developed. Provisions for vegetation conservation for expansion or alteration of single family development in 20.16.620(2) will provide a minimal buffer but will not have a discernible effect on hydrology. In cases where interflow is limited by hard shoreline armoring, provisions encouraging softer solution to shoreline stabilization are provided in SMP 20.16.870. Where shorelines are currently armored, 20.16.870.b.2 may result in improvements. New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor improvements to hydrology by application of: • SMP 20.16.630 –Mitigation Sequencing for	**Watershed Level:** City and Kitsap County land use regulations primarily affect lake water quality on a watershed level primarily through preservation of native forests on tributary stream watersheds. The effect on water quality is roughly proportional to the extent of large lot forest or rural zoning in a watershed. City and County Critical Areas (CA) regulations for wetlands, and Fish and Wildlife Conservation Areas (FWCA) preserve beneficial water quality functions of wetlands and buffers. City and county stormwater regulations have a substantial effect on water quality runoff for new development, but existing development which is the majority of affected watersheds is little affected. **Reach Level:** Native vegetation preservation on new lots and development is addressed in SMP 20.16.610 – Buffers and Setbacks, 20.16.620 – Vegetation Conservation. Provisions for vegetation conservation for expansion or alteration of single family development in 20.16.620(2) will provide a minimal buffer which will have a substantial effect on overland discharge of herbicides and pesticides from lawn. In the short term, these provisions will affect few lots. Over time, these provisions and public education could lead to a substantial number of residential lots and other development incorporating buffers that will reduce overland discharge of herbicides and pesticides from lawn. New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in improvements to water quality through buffers and other measures by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Such improvements on the reach level are likely to affect little shoreline in the short term but may cumulatively have a substantial beneficial effect through application of regulations and public education. Improvements on the reach level will have a substantial effect in those cases where contributing watersheds are small compared to	**Watershed Level:** Upstream changes in hydrology that increase erosion and result in sedimentation that changes the substrate structure of the nearshore are addressed by city and county land use regulations that affect vegetation preservation and impervious surface. The scale of the effect is related to the extent of large lot forest or rural zoning that protects forests. City and county stormwater regulations have a substantial effect on peak flows for new development, but existing development which is the majority of affected watersheds is little affected. Interruption of natural sediment sources from dams or dredging of depositional areas are addressed by city and county CA regulations **Reach Level:** Nearshore substrate will be benefitted by provisions limiting hard armoring in SMP 20.16.870 – Shoreline Stabilization. SMP 20.16.630. Application to existing single family development of 20.16.870.b.2 may result in minor improvements to current hard armoring in conjunction with 20.16.620(2) which provides a minimal vegetation buffer. New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in improvements to water quality through buffers and other measures by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Such improvements on the reach level are likely to affect little shoreline in the short term but may cumulatively have a substantial beneficial effect through application of regulations and public education.	**Reach Level:** Native vegetation preservation on new lots and development and resulting habitat benefits are addressed in SMP 20.16.610 – Buffers and Setbacks. Provisions for vegetation conservation for expansion or alteration of single family development in 20.16.620(2) will provide a minimal buffer which will have a minor impacts on providing food chain functions.. In the short term, these provisions will affect few lots, however, over time, these provisions and public education could lead to a substantial improvement on buffers on a large number of residential lots. Adverse impacts of inwater structures are addressed by SMP 20.16.820 Docks, Piers, and in-water structures, 20.16.750 Marinas and Boating Facilities, and: 20.16.760 Recreational Development which contain specific performance standards that will reduce impacts. Existing in-water facilities will be gradually upgraded over time as they need to be replaced. New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in improvements to aquatic habitat through buffers and other measures by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Such improvements on the reach level are likely to have a substantial cumulative beneficial effect through application of regulations and public education.	**Watershed Level:** City and county land use regulations affect terrestrial habitat primarily through preservation of vegetation. Forest or rural zoning is likely to preserve lands providing habitat. City and County CA regulations for wetlands, and FWCA preserve resources and buffers that provide habitat. The effect of these regulations depends largely on the proportion of watersheds that are not currently developed. **Reach Level:** Native vegetation preservation providing habitat on new lots and development are addressed in SMP 20.16.610 – Buffers and Setbacks. The provisions for vegetation conservation for expansion or alteration of single family development in 20.16.620(2) will provide a minimal buffer which will have a little or no beneficial effect on upland habitat except for small species. Where habitat values are present, new development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in buffers and other measures by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Such improvements on the reach level are likely to have a beneficial effect where terrestrial habitat is currently present.

Lake Environments					
Indicators	**Hydrology**	**Water Quality**	**Aquatic Habitat/Substrate**	**Aquatic Habitat/Organic matter**	**Terrestrial Habitat**
	No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Such improvements to hydrology on the reach level are likely to be minor compared to watershed level processes.	the area of the shoreline.			
Kitsap Lake					
Lake Kitsap (LK) 1 South side of lake to 1976 Price Rd Lake Kitsap Park Shoreline SED: Shoreline Recreation Developed portion of park	Little change in the developed portion of the park is expected. If substantial redevelopment of the park occurs it would likely result in little or no degradation and may result in minor improvements to hydrology by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Not likely to change freshwater inputs. No change or positive change in ecological functions	If substantial redevelopment of the park occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. No change or positive change in ecological functions	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Softer shoreline stabilization may be included as mitigation and increased sediment recruitment and transport. No change or positive change in ecological functions	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements to water quality by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater vegetated buffers may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides and upgrade of parking to meet current stormwater treatment requirements may result in water quality benefits. No change or positive change in ecological functions	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater setbacks of buildings & vegetated buffers vegetated buffers would benefit aquatic habitat through improved water quality. No benefits to terrestrial habitat likely. No change or positive change in ecological functions
Lake Kitsap (LK) 2 Easterly portion of Lake Kitsap Park - Wetlands Proposed SED: Urban Conservancy	Little change in preserved open space wetland area is expected. No change in ecological functions	Little change in preserved open space wetland area is expected. No change in ecological functions	Little change in preserved open space wetland area is expected. No change in ecological functions	Little change in preserved open space wetland area is expected. No change in ecological functions	Little change in preserved open space wetland area is expected. No change in ecological functions
Lake Kitsap (LK) 3 Platted Lake Kitsap Proposed SED: Shoreline Residential	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers. Not likely to change hydrologic conditions of surface water or groundwater interflow. No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may replace bulkheads with softer solutions. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers that improve food chain and related functions. If docks are replaced, grating or other light penetration will be provided. Not likely to substantially change light energy or solar incidence. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
Lake Kitsap (LK) 4 1012 Kitsap Lake Rd Navy – Camp McKean Proposed SED: Shoreline Recreation	Little change in the developed portion of the park is expected. US Navy actions must comply with SMP as part of the CZM plan. If substantial redevelopment of the park occurs it would likely result in little or no degradation and may result in minor improvements to hydrology by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Not likely to change freshwater inputs. No change or positive change in ecological functions	If substantial redevelopment of the park occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. No change or positive change in ecological functions	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Softer shoreline stabilization may be included as mitigation and increased sediment recruitment and transport. No change or positive change in ecological functions	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements to water quality by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater vegetated buffers may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides and upgrade of parking to meet current stormwater treatment requirements may result in water quality benefits. No change or positive change in ecological functions	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater setbacks of buildings & vegetated buffers vegetated buffers would benefit aquatic habitat through improved water quality. No benefits to terrestrial habitat likely. No change or positive change in ecological functions
Twin Lakes					

Lake Environments					
Indicators	**Hydrology**	**Water Quality**	**Aquatic Habitat/Substrate**	**Aquatic Habitat/Organic matter**	**Terrestrial Habitat**
Twin Lakes Proposed SED: Urban Conservancy	Little or no change is projected on the shoreline or within the watershed of this element of the City's protected watershed. No change in ecological functions.	Little or no change is projected on the shoreline or within the watershed of this element of the City's protected watershed. No change in ecological functions.	Little or no change is projected on the shoreline or within the watershed of this element of the City's protected watershed. No change in ecological functions.	Little or no change is projected on the shoreline or within the watershed of this element of the City's protected watershed. No change in ecological functions.	Little or no change is projected on the shoreline or within the watershed of this element of the City's protected watershed. No change in ecological functions.
Union Reservoir					
Union River and Reservoir Proposed SED: Urban Conservancy	Little or no change is projected on the shoreline or within the watershed of this element of the City's protected watershed. No change in ecological functions.	Little or no change is projected on the shoreline or within the watershed of this element of the City's protected watershed. No change in ecological functions.	Little or no change is projected on the shoreline or within the watershed of this element of the City's protected watershed. No change in ecological functions.	Little or no change is projected on the shoreline or within the watershed of this element of the City's protected watershed. No change in ecological functions.	Little or no change is projected on the shoreline or within the watershed of this element of the City's protected watershed. No change in ecological functions.

Table 3-2. Streams - Matrix by Reach for Evaluation of Cumulative Effects of Shoreline Management Plan on Ecological Productivity

Stream Environments					
	Hydrology	**Water Quality**	**Aquatic Habitat/Stream Structure**	**Aquatic Habitat/Organic**	**Terrestrial Habitat**
	Watershed Level: <u>Peak Flows:</u> The watershed size affects the structure and pattern of tributary discharge to the system. Larger systems with a greater geographical coverage tend to have tributaries that are affected differentially by precipitation patterns. The effect of single storm events on the system depends on the geographic extent of weather patterns. Natural stream systems generally reach equilibrium in geomorphic processes that result in a stable bed and substrate. <u>Groundwater/Interflow:</u> Streamflow also includes interflow (shallow subsurface flow from shallow aquifers from precipitation that infiltrates into the soil surface and travels by means of gravity toward a stream). Interflow is often a substantial component of base flows in low-precipitation periods **Reach Level:** Native vegetation influences the patterns by which precipitation reaches surface water. Vegetation cover affects the rate of runoff, infiltration, and the resistance of soils to erosion from a variety of sources. Each of these factors has an impact on stream morphology and stability. Native vegetation is adapted to regional weather, geologic, and soil conditions, as well as use as habitat by a variety of species and therefore will function as a complete system. Sources of human disturbance include Pervious surfaces such as lawns and pastures can substantially increase runoff as compared to native forests. Impervious surfaces related to	**Watershed Level:** Streams serve as transport pathways for nutrients in both directions. They accumulate nutrients from groundwater and terrestrial sources and transport them downstream, during which time numerous chemical and biological interactions repeatedly cycle the nutrients between organic and inorganic forms. Nutrient balance in natural environments is a finely balanced and produces complex interactions with habitat for a variety of species. Natural systems tend to produce high quality water with moderate levels of nutrients and few or no toxins. Tree cover helps maintain cool water temperatures through provision of shade and creation of a cool and humid microclimate near the shore. Wetlands have a variety of beneficial impacts on the nutrients and pollutants: • Pollutants in the form of particulates are retained in a wetland with greater detention time. • Plants enhance sedimentation by acting like a filter and causing sediment particles to drop to the wetland surface • Wetlands uptake dissolved phosphorus and toxic compounds through adsorption to soil particles • Removal of nitrogen from the aquatic system (denitrification) is done by bacteria that live in the absence of oxygen. **Reach Level:** The same mechanisms as outlined above are present within SMP	**Watershed Level:** Upstream changes in hydrology that increase erosion and result in sedimentation that alters the substrate structure is largely related to the proportion of native vegetation in a watershed and the amount of impervious surface. Forest cover tends to control rates of runoff that otherwise lead to excessive erosion and sedimentation. Natural systems tend to produce high quality water with moderate levels of nutrients and few or no toxins. Interruption of natural sediment sources from dams or dredging of depositional areas such as deltas changes substrate supply. Structures may interrupt the longitudinal flow of sediment. **Reach Level** The stream bottom substratum is critical habitat for a variety of species including food web species such as benthic macroinvertebrates. Substrate is critical for spawning for a variety of fish including salmon. Egg incubation and embryo development, is affected by substrate quality. LWD performs several critical functions in forested lowland streams, including dissipation of flow energy, protection of streambanks, stabilization of streambeds, storage of sediment, and providing in-stream cover and habitat diversity. Many fish species including salmon rear primarily in pools with high habitat complexity, with abundant cover. Many species, including some species of salmon rely heavily on small lowland streams and associated off-channel wetland areas during their rearing phase.	**Reach Level:** Riparian vegetation helps maintain cool water temperatures through provision of shade and creation of a cool and humid microclimate over the stream. Organic matter is important to the ecosystem in the form of leaves, branches, and terrestrial insects and is an important element of the food chain in streams and nearshore habitat in lakes. Sources of human disturbance include: The loss of upland buffers through urbanization lead to a loss in shade and cooler temperature areas adjacent to streams and reduces the contribution of organic matter, all of which are important habitat elements for a variety of species. Loss of upland vegetation and nearshore woody debris changes habitat conditions and may lead to less refuge and more predation, particularly for juvenile salmon. Inwater structures such as dams may block or retard through increased velocity of movement of fish and other species along a stream. Docks and other inwater facilities contribute to providing habitat for some predators, particularly bass, and also may cause avoidance behavior forcing them into environments where food and shelter are less available and where predation is increased.	**Watershed Level:** Continuity with habitat areas outside of the shoreline improves the productivity of habitat by providing links to larger areas and different types of riparian vegetation communities outside of the shoreline. The size of habitat areas is a primary factor in productivity, as well as complexity in habitat type. **Reach Level:** Area, width and continuity are all important to wildlife habitat productivity. Larger wider riparian communities tend to have more complex vegetation communities and a wider variety of habitat types. Continuity links different types of riparian vegetation communities, and links a variety of upland areas which provides for access to greater habitat variety. Continuity allows movement to respond to local disruptions in productivity. A nearly continuous riparian zone is the typical natural condition in the Pacific Northwest. Wetlands adjacent to lakes also provide an important habitat niche for a variety of species, particularly amphibians. Sources of human disturbance include: Reduction in the size or width of riparian community below the threshold to provide meaningful habitat. Fragmentation and isolation reduces the ability of wildlife to access otherwise productive habitat. Species that are sensitive to proximity impacts such as noise or light may not occupy otherwise suitable habitat. The isolation of prey species in small areas with limited ability for refuge may increase predatory efficiency such that a balance between

Stream Environments					
	Hydrology	**Water Quality**	**Aquatic Habitat/Stream Structure**	**Aquatic Habitat/Organic**	**Terrestrial Habitat**
	roadways, driveways and parking areas tend to produce much higher peak runoff and much lower base flows and result in higher erosion and sedimentation rates that affect substrate result in lower levels of infiltration and loss of low temperature interflows. Reduction in wetlands can decrease storage resulting in larger peak flows and less base flow into the system.	jurisdiction. Sources of human disturbance include: Pervious surfaces such as lawns and pastures can substantially increase nutrients from fertilizers and pollutants and toxins through herbicides and pesticides. . Impervious surfaces related to roadways, driveways and parking areas tend to produce hydrocarbon pollutants and heavy metals. Loss of tree cover tends to reduce shade and increase water temperature. Loss or alternation of wetlands reduces functions reduces or eliminates positive water-quality contributions.	Sources of human disturbance include: Stream channel morphology can be affected by shifts in the hydrologic regime due to increases in impervious surfaces, which changes the amount and patterns of runoff and streamflow. Higher flows generally lead to changes in channel character, higher stream erosion rates, increases in sedimentation, and disconnections from the floodplain with resulting loss of flood storage. In general, these changes compound each other in an urban environment. Streambed quality can be degraded by scour and erosion deposition of fine sediment, by streambed instability due to high flows. A higher proportion of fine sediment can lead to conditions in which spawning and egg incubation is reduced or precluded and production of macroinvertebrates is reduced. Changes in sediment can be affected by dams and stream armoring that limit the source of substrate and lead to downstream alteration of substrate structure. LWD in streams, and resulting functions are reduced by clearing for agriculture or urban development. Absent or immature forests lack the potential for mature trees to fall and provide woody vegetation. Channel clearing and channelization removes LWD that may be present.		predation and replacement may not be maintained. Domestic animals such as dogs and cats may increase the predator population beyond the natural balance. Loss of wetlands eliminates a habitat type important to the lifecycle of a variety of species.
Effects of Programs	**Watershed Level:** <u>Peak Flows:</u> City and Kitsap County land use regulations primarily affect watershed vegetation and impervious surface and runoff patterns through zoning, and density regulations. The extent of large lot forest or rural zoning in a watershed is the primary factor that preserves native vegetation and preserved natural hydrology. City and county Critical Areas (CA) regulations for wetlands, and Fish and Wildlife Conservation Areas (FWCA) preserve some land through buffers, but do not affect enough land area to affect the runoff patterns resulting from removal of native forests. City and county stormwater regulations have a substantial effect on peak runoff for new development, but the majority of existing impervious surface is not affected <u>Groundwater/Interflow:</u> City and Kitsap County land use regulations affecting watershed vegetation and impervious surface are the primary factors affecting infiltration to the shallow aquifer and from there into streams. The extent of large lot forest or rural zoning in watersheds affects the scale of interflow. City	**Watershed Level:** City and Kitsap County land use regulations primarily affect stream water quality on a watershed level primarily through preservation of native forests. The effect on water quality is roughly proportional to the extent of large lot forest or rural zoning in a watershed. City and CA regulations for wetlands and FWCA preserve beneficial water quality functions of wetlands and streams and their buffers. City and county stormwater regulations have a substantial effect on water quality runoff for new development, but existing development which is the majority of affected watersheds is little affected. Programs such as the Dairy Nutrient Management Act and the Concentrated Animal Feeding Operation (CAFO) permit address point pollution. These pollution sources, however, are not a major contributor to watersheds in Bremerton. **Reach Level:** Native vegetation preservation on new lots and development is addressed in SMP 20.16.610 – Buffers and Setbacks. Provisions	**Watershed Level:** Upstream changes in hydrology that increase erosion and result in sedimentation that changes the substrate structure of the nearshore are addressed by city and county land use regulations that affect vegetation preservation and impervious surface. The scale of the effect is related to the extent of large lot forest or rural zoning that protects forests. City and county stormwater regulations have a substantial effect on peak flows for new development, but existing development which is the majority of affected watersheds is little affected. Interruption of natural sediment sources from dams or dredging of depositional areas are addressed by city and county CA regulations **Reach Level:** Nearshore substrate will be benefitted by provisions limiting hard armoring in SMP 20.16.870 – Shoreline Stabilization. SMP 20.16.630. Application to existing single family development of 20.16.870.b.2 may result in minor improvements to current hard armoring in conjunction with 20.16.620(2) which provides a minimal vegetation buffer and will likely result in	**Reach Level:** Native riparian vegetation preservation on new lots and development and resulting habitat benefits are addressed in SMP 20.16.610 – Buffers and Setbacks. Provisions for vegetation conservation for expansion or alteration of single family development in 20.16.620(2) will provide a minimal buffer which will have a minor impacts on providing food chain functions.. In the short term, these provisions will affect few lots, however, over time, these provisions and public education could lead to a substantial improvement on buffers on a large number of residential lots. Adverse impacts of inwater structures are addressed by SMP 20.16.820 Docks, Piers, and in-water structures, 20.16.750 Marinas and Boating Facilities, and: 20.16.760 Recreational Development which contain specific performance standards that will reduce impacts. Existing in-water facilities will be gradually upgraded over time as they need to be replaced. New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in improvements to aquatic habitat through buffers	**Watershed Level:** City and Kitsap County land use regulations affect terrestrial habitat primarily through preservation of vegetation. Forest or rural zoning is likely to preserve lands providing habitat. City and County CA regulations for wetlands and FWCA preserve resources and buffers that provide habitat. The effect of these regulations depends largely on the proportion of watersheds that are not currently developed. **Reach Level:** Native vegetation preservation providing habitat on new lots and development are addressed in SMP 20.16.610 – Buffers and Setbacks. The provisions for vegetation conservation for expansion or alteration of single family development in 20.16.620(2) will provide a minimal buffer which will have a little or no beneficial effect on upland habitat except for small species. Where habitat values are present, new development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in buffers and other measures by application of: • SMP 20.16.630 –Mitigation Sequencing for

Stream Environments					
	Hydrology	**Water Quality**	**Aquatic Habitat/Stream Structure**	**Aquatic Habitat/Organic**	**Terrestrial Habitat**
	and county stormwater regulations provide some incentives for infiltration, but do not affect the majority of largely developed land uses in watersheds. **Reach Level:** Native vegetation preservation on new lots and development is addressed in SMP 20.16.610 – Buffers and Setbacks, 20.16.620 – Vegetation Conservation, 20.16.650 – Water Quality, Stormwater, and Non-Point Pollution. These provisions have the most effect on undeveloped land. Provisions for vegetation conservation for expansion or alteration of single family development in 20.16.620(2) will provide a minimal buffer but will not have a discernible effect on hydrology. In cases where interflow is limited by hard shoreline armoring, provisions encouraging softer solution to shoreline stabilization are provided in SMP 20.16.870. Where shorelines are currently armored, 20.16.870.b.2 may result in improvements. New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor improvements to hydrology by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Such improvements to hydrology on the reach level are likely to be minor compared to watershed level processes.	for vegetation conservation for expansion or alteration of single family development in 20.16.620(2) will provide a minimal buffer which will have a substantial effect on overland discharge of herbicides and pesticides from lawn. In the short term, these provisions will affect few lots. Over time, these provisions and public education could lead to a substantial number of residential lots and other development incorporating buffers that will reduce overland discharge of herbicides and pesticides from lawn. New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in improvements to water quality through buffers and other measures by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Such improvements on the reach level are likely to affect a small area of the shoreline in the short term but may cumulatively have a substantial beneficial effect through application of regulations and public education. Improvements on the reach level will have a substantial effect in those cases where contributing watersheds are small compared to the area of the shoreline.	improvements to water quality through filtering and nutrient uptake. Large woody debris is provided only by mature native forests. Any beneficial effects of new buffers will likely be limited and occur only in the more distant future. New development and substantial redevelopment of sites will likely result in little or no degradation where buffers and mature vegetation are present and will likely result in improvements to buffers and other measures by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Such improvements on the reach level are likely to affect little shoreline in the short term but may cumulatively have a substantial beneficial effect through application of regulations and public education.	and other measures by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Such improvements on the reach level are likely to have a substantial cumulative beneficial effect through application of regulations and public education.	No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Such improvements on the reach level are likely to have a beneficial effect where terrestrial habitat is currently present.
`Gorst Creek					
Gorst Creek (GC) 1 Sinclair Inlet to SR 3 Proposed SED: Left Bank (north) Urban Conservancy Right Bank (south) Parallel Designation: Waterward of Building setback– Urban Conservancy, Landward of Building Setback - Shoreline Commercial (Note – designated Freeway Corridor I in Bremerton UGA	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor improvements to hydrology by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use The Urban Conservancy designation from the building setback assures buffers, however little change to hydrology occur. No change or positive change in ecological	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings & vegetated buffers may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. New development will meet current stormwater standards for treatment.	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use The Urban Conservancy designation from the building setback assures buffers, and might result in softer shoreline stabilization and increased sediment recruitment and transport.	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings & vegetated buffers may result in a riparian corridor that provides a wider range of aquatic habitat functions.	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings & vegetated buffers vegetated buffers would potentially benefit terrestrial habitat. No change or positive change in ecological

Stream Environments					
	Hydrology	**Water Quality**	**Aquatic Habitat/Stream Structure**	**Aquatic Habitat/Organic**	**Terrestrial Habitat**
zoning map) Shoreline length 233 feet Number of commercial lots – 2 Commercial lot acres – 1.84 Undeveloped lots- 1 (0.14 acres) Lots range in depth from 93 to 133 feet Building setbacks 15 to 25 feet	functions	No change or positive change in ecological functions	No change or positive change in ecological functions	No change or positive change in ecological functions	functions
Gorst Creek (GC) 2 SR 3 to Sam Christopherson Avenue Proposed SED: Shoreline Commercial (Note – designated Freeway Corridor I in Bremerton UGA zoning map) Shoreline length 1,666 feet Number of commercial lots – 9 Commercial lot acres – 6.98 Number of residential lots—11 Residential lot acres—8.72 Lots range in depth from 130 to 400 feet	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor improvements to hydrology by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use The limited extent of the reach limits potential benefits to hydrology. No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings & vegetated buffers may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. New development will meet current stormwater standards for treatment. No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Building setback and buffers may result in softer shoreline stabilization and increased sediment recruitment and transport. No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings & vegetated buffers may result in a riparian corridor that provides a wider range of aquatic habitat functions. No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings & vegetated buffers vegetated buffers would potentially benefit terrestrial habitat. No change or positive change in ecological functions
Gorst Creek (GC) 3 Sam Christopherson Avenue to W Belfair Valley Rd Proposed SED: Shoreline Residential (Note – designated Residential in Bremerton UGA zoning map) Shoreline length 1,000 feet Number of residential lots 5 MH-real property lots 1 Lots range in depth from 100 to 550 feet	This area is likely to change substantially in the future from a rural area to an urban residential neighborhood. Residential development standards in SMP 20.16.770 will likely result in development clustered away from the shoreline with required buffers. New development will meet current stormwater management requirements. Hydrologic inputs from surface water and interflow are likely to be preserved to some extent. No change in ecological functions	Residential development meeting SMP standards is likely to preserve the existing extensive tree cover and preserve water temperature, water quality and nutrient cycling that maintains water quality. New development will meet current stormwater treatment requirements. No change in ecological functions	Residential development meeting SMP standards is likely to preserve the stream structure. No change ecological functions	Residential development meeting SMP standards is likely to preserve the existing extensive tree cover and preserve water quality and nutrient cycling that maintains aquatic habitat value No change in ecological functions	Subdivision in the future with Urban Conservancy designation and development standards is likely to preserve riparian vegetation buffers that contribute to terrestrial habitat. No change in ecological functions
Gorst Creek (GC) 4 W Belfair Valley Rd to power line	Little change in the developed portion of the park is expected.	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements to water quality by	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements by application of	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements to water quality by	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements by application of

Stream Environments					
	Hydrology	**Water Quality**	**Aquatic Habitat/Stream Structure**	**Aquatic Habitat/Organic**	**Terrestrial Habitat**
easement (hatchery in Otto Jarstad Park) Proposed SED: Shoreline Recreation City park and fish hatchery	If substantial redevelopment of the park occurs it would likely result in little or no degradation and may result in minor improvements to hydrology by application of SMP 20.16.630 – Mitigation Sequencing for No Net Loss of Ecological Function. Not likely to change freshwater inputs. No change or positive change in ecological functions	application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater vegetated buffers may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides and upgrade of parking to meet current stormwater treatment requirements may result in water quality benefits. No change or positive change in ecological functions	SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. The channelized stream reach in the park was previously replaced by a more functional naturalized channel and will be retained. No change or positive change in ecological functions	application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater vegetated buffers may increase organic inputs important to the food chain and other aquatic habitat functions. No change or positive change in ecological functions	SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater setbacks of buildings & vegetated buffers vegetated buffers would benefit terrestrial habitat. No change or positive change in ecological functions
Gorst Creek (GC) 5 Power line easement in Otto Jarstad Park to end of shoreline jurisdiction Proposed SED: Urban Conservancy City owned Watershed	Little or no change is projected on the shoreline or within the watershed of this element of the city's protected watershed. No change in ecological functions.	Little or no change is projected on the shoreline or within the watershed of this element of the city's protected watershed. No change in ecological functions.	Little or no change is projected on the shoreline or within the watershed of this element of the city's protected watershed. No change in ecological functions.	Little or no change is projected on the shoreline or within the watershed of this element of the city's protected watershed. No change in ecological functions.	Little or no change is projected on the shoreline or within the watershed of this element of the city's protected watershed. No change in ecological functions.
Union River and Reservoir	Little or no change is projected on the shoreline or within the watershed of this element of the city's protected watershed. No change in ecological functions.	Little or no change is projected on the shoreline or within the watershed of this element of the city's protected watershed. No change in ecological functions.	Little or no change is projected on the shoreline or within the watershed of this element of the city's protected watershed. No change in ecological functions.	Little or no change is projected on the shoreline or within the watershed of this element of the city's protected watershed. No change in ecological functions.	Little or no change is projected on the shoreline or within the watershed of this element of the city's protected watershed. No change in ecological functions.

Table 3-3. Marine Shorelines - Matrix by Reach for Evaluation of Cumulative Effects of Shoreline Management Plan on Ecological Productivity

Marine Shorelines					
	Freshwater Inputs and Tidal Flows	**Light energy or solar incidence**	**Sediment/Substrate Structure**	**Carbon Cycling/Water Quality**	**Aquatic and Terrestrial Habitat**
	Freshwater inputs are most important in estuaries where water input and mixing create strong gradients in physical-chemical characteristics, biological activity and diversity, and the potential for major adverse impacts associated with human activities. Sources include streams estuaries as well as seepage zones in bluffs or banks. Tidal flows move water, sediments, organisms/propagules, nutrients, and organic matter between the seaward limit of low tides and the landward limit of high tides. Tidal flows contribute to habitat formation, nutrient cycling, organic matter export, dispersal of organisms, species support (e.g., maintenance of salinity gradients) and connectivity. Local tidal flows are influenced by the regional tidal regime, local topography, and connectivity between marine/nearshore waters and shoreline or inland habitats. Sources of human disturbance include: • Changes in stream-flow regime from dams, diversions, withdrawals,	Light entering both freshwater and marine nearshore environments is a key factor controlling biological processes such as primary production, the growth of plants, reproductive cycles of aquatic animals, and migratory movements and predator-prey interactions. Shallow bays and inlets, estuaries, lagoons, and marshes have high productivity due to availability of light, as well as other factors. Eelgrass beds form narrow corridors where light penetration is limited by turbidity. Kelp forest distribution is limited to areas with light penetration to the bottom as well as appropriate substrates, and moderate wave/current energy. Algal production on the surface of tide flats is an important source of food for prey items of salmonids and other fish. Light levels affect water temperatures that directly affect the growth and productivity of aquatic plants and the degree of desiccation and heat stress in upper beach areas which	Sediment is a key structural constituent of many marine environments including: • Beaches which provide energy dissipation, forage fish spawning, habitat formation, shellfish support, waterfowl foraging, eelgrass habitat, and juvenile salmon rearing and migration; • Sand and mud flats which typically occur at mouths of rivers and streams where relatively large supplies of sediment are deposited; salt marshes and • Brackish marshes that occur in areas with tidal inundation typically at elevations at and above MHHW; Process intensive areas for supply include coastal bluffs and streams; for transport include streams and beaches in transport zones; for deposition include estuaries (tidal and distributary channels), barrier beaches; stream deltas Coastal bluffs are the primary source of beach sediments in the Puget Sound, however many marine environments in Bremerton are primarily	Nearshore and marine waters receive inputs of nutrients and organic matter from adjacent uplands, streams, rivers, and groundwater seeps and from deeper ocean waters via estuarine circulation and mixing, from nearshore bottom sediments. Organic matter import and export provides the basis for detrital food webs, which are important elements of both freshwater and marine food webs Detrital food webs support many of the prey items salmonids rely on. Process intensive areas include land uses/land cover adjacent to surface waters discharging to marine shorelines Sources of human disturbance include a variety of uses that discharge materials into water including • Agricultural land uses – dairy, pasture, feed lots, manure sources • Impervious surfaces and stormwater runoff from roads, residential lawns • Wildlife/domestic animal concentrations	All of the processes in previous columns contribute to the presence and quality of aquatic and terrestrial habitat including: This criteria relates to the presence of particular elements that indicate high quality aquatic habitat including: • estuaries, • barrier lagoons/marshes, • brackish marshes, • open coastal inlets, • eelgrass beds • kelp forests • beaches • upland wetlands • adjacent marine riparian vegetation The presence of these features are indicators of indicate high quality marine habitat. Terrestrial habitat is also an important element

Marine Shorelines					
	Freshwater Inputs and Tidal Flows	**Light energy or solar incidence**	**Sediment/Substrate Structure**	**Carbon Cycling/Water Quality**	**Aquatic and Terrestrial Habitat**
	• Increased impervious areas changes the magnitudes, timing, frequency, and duration of freshwater inputs • Encroachment into estuary/delta from road crossings/culverts at river mouths, filling of floodplains and estuarine wetlands • Armoring or fill in nearshore that cuts off movement of groundwater into beach sediments • Elimination of wetlands adjacent to marine shorelines that reduces storage and inputs of fresh water • Tidal flows may be reduced by barriers such as tide gates, fill, culverts or road crossings	are important habitats for forage fish spawning. Foraging success of juvenile fish (or their predators) depends on adequate light levels for locating and capturing prey. Sources of human disturbance include: • Decrease in daytime light levels due to artificial shading from docks and other inwater structures • Increase in daytime light levels and heat/desiccation stress due to loss of natural shade from removal of riparian vegetation • Increase in nighttime light levels due to artificial lighting from buildings, docks, marinas, or roadways.	supplied by streams Sources of human disturbance include: • Changes in stream-flow regime impervious surfaces which increase instream erosion and increase the fine sediment component of beaches, estuaries and other depositional features • Armoring of feeder bluffs which may remove sediment sources • Nearshore structures such as jetties, groins, docks, dikes, and roads that limit the longitudinal movement of sediment.	• Failing septic systems • Contaminated sediments; point discharges of toxins Local features especially sensitive to inputs include numerous shallow, enclosed bays with low flushing rates, high shoreline to volume ratios. Elimination of wetlands in tributary streams and adjacent to marine shorelines eliminates a natural feature that tends to reduce nutrients, pathogens and toxins. Removal of vegetation cover also eliminates natural processes that attenuate discharge of nutrients, pathogens and toxins.	of the shoreline and is generally indicated by adjacent native vegetation with productivity associated with • Greater area • Greater width • Maturity and complexity of vegetation • Wetlands • Continuity and links with other habitat areas • The presence of sensitive species • Limited proximity impacts such as noise or light • Limited access by domestic animals such as dogs and cats that increase predation The extent of human disturbance is indicated by the relative abundance of these elements.
Effects of Programs	**Watershed Level:** Freshwater inputs are affected by city and county land use regulations that affect watershed vegetation and impervious surface and runoff patterns. The extent of large lot forest or rural zoning in a watershed is the primary factor that preserves native vegetation and preserved natural hydrology. City and county Critical Areas (CA) regulations for wetlands, and Fish and Wildlife Conservation Areas (FWCA) preserve some land through buffers, but do not affect enough land area to affect the runoff patterns resulting from removal of native forests. City and county stormwater regulations have a substantial effect on peak runoff for new development, but the majority of existing impervious surface is not affected Forest cover also affects the scale at which upland watersheds are recharged and allow interflow into tributary streams or directly to marine environments. City and county stormwater regulations provide some incentives for infiltration, but do not affect the majority of largely developed land uses in watersheds. **Reach Level:** Some influence on freshwater inputs are provided by native vegetation preservation on new lots and development is addressed in SMP 20.16.610 – Buffers and Setbacks, 20.16.620 – Vegetation Conservation, 20.16.650 – Water Quality, Stormwater, and Non-Point Pollution. These provisions have the most effect on undeveloped land.	Light levels related to removal of shade and desiccation of upper beaches is addressed by native vegetation preservation on new lots and development addressed in SMP 20.16.610 Buffers and Setbacks, 20.16.620 Vegetation Conservation. Provisions for vegetation conservation for expansion or alteration of single family development in 20.16.620(2) will provide a minimal buffer which will have a limited l effect on shading. Adverse impacts of shading due to inwater structures is addressed by SMP 20.16.820 Docks, Piers, and in-water structures, 20.16.750 Marinas and Boating Facilities, and: 20.16.760 Recreational Development which contain specific performance standards that will reduce impacts. Existing in-water facilities will be gradually upgraded over time as they need to be replaced. New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in improvements to water quality through buffers and other measures by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Such improvements on the reach level are likely to have limited beneficial effect in the	**Watershed Level:** Upstream changes in hydrology that increase erosion and result in sedimentation that changes the substrate structure of the nearshore are addressed by city and county land use regulations that affect vegetation preservation and impervious surface. The scale of the effect is related to the extent of large lot forest or rural zoning that protects forests. Interruption of natural sediment sources from dams or dredging of depositional areas are addressed by city and county CA regulations **Reach Level:** Nearshore substrate will be benefitted by provisions limiting hard armoring in SMP 20.16.870 – Shoreline Stabilization. SMP 20.16.630. Application to existing single family development of 20.16.870.b.2 may result in minor improvements to current hard armoring in conjunction with 20.16.620(2) which provides a minimal vegetation buffer. Adverse impacts of structures is addressed by SMP 20.16.820 Docks, Piers, and in-water structures which substantially limits jetties, weirs and groins. New development and substantial redevelopment of sites will likely result in little or no degradation will likely result in improvements by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial	**Watershed Level:** City and Kitsap County land use regulations primarily affect stream water quality on a watershed level primarily through preservation of native forests which general produce high water quality. The effect on water quality is roughly proportional to the extent of large lot forest or rural zoning in a watersheds. City and county CA regulations for wetlands, and FWCA preserve beneficial water quality functions of wetlands and streams and their buffers. City and county stormwater regulations have a substantial effect on water quality runoff for new development, but existing development which is the majority of affected watersheds is little affected. Programs such as the Dairy Nutrient Management Act and the Concentrated Animal Feeding Operation (CAFO) permit address point pollution. These pollution sources, however, are not a major contributor to watersheds in Bremerton. **Reach Level:** Buffer which improve water quality through limiting overland discharge of herbicides and pesticides from lawns and that intercept, filter or biochemically immobilize pollutants are addressed in SMP 20.16.610 Buffers and Setbacks. Provisions for vegetation conservation for expansion or alteration of single family development in 20.16.620(2) provide minimal buffers. In the short term, these provisions will affect few lots. Over time, these provisions and public education could lead to a substantial number of residential lots and other development incorporating buffers that will	**Watershed Level:** City and county land use regulations and CA regulations provide a variety of programs that tend to reduce adverse impacts from waters flowing into productive marine and terrestrial habitat. State water quality regulations and both dairy and confined animal nutrient control programs also contribute. **Reach Level:** Recognition and preservation of productive marine habitat such as estuaries, barrier lagoons/marshes, eelgrass beds, kelp forests, etc. is recognized in a variety of performance standards for shoreline modification and for specific uses. The most significant include SMP 20.16.810 Clearing and Grading, 20.16.820 Docks, Piers, and in-water structures, 20.16.830 Dredging, 20.16.850 Landfills, 20.16.870 – Shoreline Stabilization Adjacent marine riparian vegetation is addressed in SMP 20.16.610 Buffers and Setbacks. The provisions for vegetation conservation for expansion or alteration of single family development in 20.16.620(2) will provide a minimal buffer with limited beneficial effect on upland habitat except for small species. Where aquatic and terrestrial habitat is present, new development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in buffers and other measures by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and

Marine Shorelines					
	Freshwater Inputs and Tidal Flows	**Light energy or solar incidence**	**Sediment/Substrate Structure**	**Carbon Cycling/Water Quality**	**Aquatic and Terrestrial Habitat**
	Provisions for vegetation conservation for expansion or alteration of single family development in 20.16.620(2) will provide a minimal buffer but will not have a discernible effect on freshwater inputs. Alteration of tidal processes is limited by provisions in SMP 20.16.810 Clearing and Grading, 20.16.820 Docks, Piers, and in-water structures, 20.16.830 Dredging, 20.16.850 Landfills, 20.16.870 – Shoreline Stabilization all of which encourage preservation of natural processes. New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor improvements to hydrology by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use	short term but may cumulatively have a substantial beneficial effect through application of regulations and public education..	use Such improvements on the reach level are likely to affect limited areas of degraded shoreline in the short term but may cumulatively have a substantial beneficial effect through application of regulations and public education.	reduce overland discharge of herbicides and pesticides from lawn. New development and substantial redevelopment of sites will likely result in little or no degradation of water quality and will likely result in improvements to water quality through buffers and other measures by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Such improvements on the reach level are likely to affect a small area of the shoreline in the short term but may cumulatively have a substantial beneficial effect through application of regulations and public education.	• SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use
Ostrich Bay (OstB) 1 North City Limits to South limit of Naval Hospital Proposed SED: Parallel Designations Urban Conservancy waterward of Boone Rd Shoreline Commercial landward Includes Puget Sound Naval Complex, Naval Hospital Bremerton Medium bank Vegetation buffer between OHWM and Boone Dr	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan. Any major changes would be subject to SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function impacts would be addressed and mitigated. No change in ecological functions.	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan including SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function which requires impacts to be addressed and mitigated. No change in ecological functions.	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan including SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function which requires impacts to be addressed and mitigated. No change in ecological functions.	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan including SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function which requires impacts to be addressed and mitigated. No change in ecological functions.	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan. No change in ecological functions..
Ostrich Bay (OstB) 2 South limit of Hospital to Myers Place Proposed SED: Shoreline Recreation Includes Puget Sound Naval Complex, Park Medium bank Vegetation along shore is partially altered for shoreline access	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan. Any major changes would be subject to SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function impacts would be addressed and mitigated. No change in ecological functions.	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan including SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function which requires impacts to be addressed and mitigated. No change in ecological functions.	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan including SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function which requires impacts to be addressed and mitigated. No change in ecological functions.	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan including SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function which requires impacts to be addressed and mitigated. No change in ecological functions.	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan. No change in ecological functions..
Ostrich Bay (OstB) 3 Myers Place to boundary of NAD Marine Park Proposed SED: Shoreline Residential Medium bank Vegetation buffer between OHWM and Shore Drive One Naval dock in reach	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan. Any major changes would be subject to SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function impacts would be addressed and mitigated. No change in ecological functions.	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan including SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function which requires impacts to be addressed and mitigated.	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan including SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function which requires impacts to be addressed and mitigated. No change in ecological functions.	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan including SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function which requires impacts to be addressed and mitigated. No change in ecological functions.	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan including SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function which requires impacts to be addressed and mitigated. No change in ecological functions..

Marine Shorelines					
	Freshwater Inputs and Tidal Flows	**Light energy or solar incidence**	**Sediment/Substrate Structure**	**Carbon Cycling/Water Quality**	**Aquatic and Terrestrial Habitat**
		No change in ecological functions.			
Ostrich Bay (OstB) 4 NAD Marine Park South boundary of Puget Sound Naval Complex to but not including 4126 Wakefield Loop Proposed SED: Urban Conservancy Shoreline linear feet 1250 Park Shoreline is generally unaltered	Little change in present character of park is likely within shoreline. City park plans emphasize passive use. No change in ecological functions.	Little change in present character of park is likely within shoreline. City park plans emphasize passive use. No change in ecological functions.	Little change in present character of park is likely within shoreline. City park plans emphasize passive use. No change in ecological functions.	Little change in present character of park is likely within shoreline. City park plans emphasize passive use. No change in ecological functions.	Little change in present character of park is likely within shoreline. City park plans emphasize passive use. No change in ecological functions.
Ostrich Bay (0stB) 5 4126 Wakefield Loop to 2151 Madrona Pt Dr (Tip of Madrona Point)r Proposed SED: Shoreline Residential Lots range in depth from 112 to 540 feet Building setbacks 0 to 50 feet Shoreline modifications mixed 25-65% and 76-100% 14 in-water structures Upland vegetation limited Intertidal area moderate-extensive In-water vegetation: marsh, kelp, eelgrass	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor buffers. If docks are replaced, grating or other light penetration will be provided. Not likely to substantially change light energy or solar incidence. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may replace bulkheads with softer solutions. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
Oyster Bay (OyB) 1 2148 Madrona Pt to 924 Lower Oyster Bay Dr Proposed SED: Shoreline Residential Lots range in depth from 112 to 540 feet Building setbacks 0 to 50 feet Shoreline modifications mixed 25-65% and 76-100% 8 in-water structures Upland vegetation limited Intertidal area moderate-extensive In-water vegetation: marsh, kelp, eelgrass	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor buffers. Aquatic conservancy designation limits new in-water structures. If docks are replaced, grating or other light penetration will be provided Not likely to substantially change light energy or solar incidence. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may replace bulkheads with softer solutions. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. Aquatic conservancy designation limits new in-water structures. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. Aquatic conservancy designation limits new in-water structures. A few lots may redevelop or remodel and provide minor vegetated buffers would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
Oyster Bay (OyB) 2 From –but not including - 924 Lower Oyster Bay Dr to and including 4320 Kitsap Way (Flagship Inn Motel) Proposed SED: Shoreline Commercial Lots range in depth from 15 to 280 feet Building setbacks 11.5 to 40 feet Shoreline modifications 76-100% 2 in-water structures Upland vegetation limited Intertidal area limited In-water vegetation: none	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor improvements to hydrology by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor improvements to buffers and minor increase in shoreline shading by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings might result in softer shoreline stabilization and increased sediment recruitment and transport. No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings & vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings & vegetated buffers vegetated buffers would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
Oyster Bay (OyB) 3 4310 Kitsap Way to and including 1705 Marine Drive Proposed SED: Shoreline Residential Lots range in depth from 60 to 240 feet Building setbacks 25 to 75 feet Shoreline modifications mix of 25-65% and 76-100%	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor buffers. Aquatic conservancy designation limits new in-water structures. If docks are replaced, grating or other light penetration will be provided Not likely to substantially change light	Little change in present character of single family development in shoreline is likely. A few lots may replace bulkheads with softer solutions. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. Aquatic Conservancy designation limits new in-water structures. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits.	Little change in present character of single family development in shoreline is likely. Aquatic Conservancy designation limits new in-water structures. A few lots may redevelop or remodel and provide minor vegetated buffers would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions

Marine Shorelines					
	Freshwater Inputs and Tidal Flows	**Light energy or solar incidence**	**Sediment/Substrate Structure**	**Carbon Cycling/Water Quality**	**Aquatic and Terrestrial Habitat**
8 in-water structures Upland vegetation limited-moderate Intertidal area extensive In-water vegetation: marsh		energy or solar incidence. No change or positive change in ecological functions		No change or positive change in ecological functions	
Oyster Bay (OyB) 4 North of 1705 Marine Drive (but not including) to (but not including) 1901 Marine Drive Proposed SED: Parallel designation Urban Conservancy waterward of road Upland beyond road: Shoreline Residential Urban Residential Area waterward of road and water undeveloped 933 linear feet Shoreline modification 25-65% no in-water structures Upland vegetation extensive Intertidal area extensive In-water vegetation: marsh	Urban Conservancy and Aquatic Conservancy designations would retain existing shoreline functions. New residential development on the upland side of the road would have few shoreline impacts with stormwater and other development standards. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Urban Conservancy and Aquatic Conservancy designations would retain existing shoreline functions. New residential development on the upland side of the road would not be likely to substantially change light energy or solar incidence. No change in ecological functions	Urban Conservancy and Aquatic Conservancy designations would retain existing shoreline functions. New residential development on the upland side of the road would not be likely to change sediment or substrate. No change in ecological functions	Urban Conservancy and Aquatic Conservancy designations would retain existing shoreline functions. New residential development on the upland side of the road would not be likely to result in water quality impacts with stormwater and other development standards. No change in ecological functions	Urban Conservancy and Aquatic Conservancy designations would retain existing shoreline functions. New residential development on the upland side of the road would displace current terrestrial habitat, however lack of connectivity would result in minor impact. No change in ecological functions
Oyster Bay (OyB) 5 1901 Marine Drive to 2415 S Marine Drive (Across from Madrona Pt.) Proposed SED: Shoreline Residential Lots range in depth from 80 to 240 feet Building setbacks 15 to 200 feet Shoreline modification: very limited 1 in-water structure Upland vegetation limited-moderate Intertidal area extensive In-water vegetation: marsh	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor buffers. Aquatic Conservancy designation limits new in-water structures. If docks are replaced, grating or other light penetration will be provided Not likely to substantially change light energy or solar incidence. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers and retain existing shoreline or substitute bulkheads with softer solutions. A few lots may replace bulkheads with softer solutions. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. Aquatic Conservancy designation limits new in-water structures. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. Aquatic Conservancy designation limits new in-water structures. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
Oyster Bay (OyB) 6 3054 S Marine Drive 3042 Marine Dr (tip of Rocky Pt.) Proposed SED: Shoreline Residential Lots range in depth from 60 to 360 feet Building setbacks 10 to 100 feet Shoreline modification: mostly 76-100%, some 25-65%, small area in northern section 1-24% 8 in-water structures Upland vegetation limited-moderate Intertidal area limited In-water vegetation: eelgrass	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor buffers. Aquatic Conservancy designation limits new in-water structures. If docks are replaced, grating or other light penetration will be provided Not likely to substantially change light energy or solar incidence. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers and retain existing shoreline or substitute bulkheads with softer solutions. A few lots may replace bulkheads with softer solutions. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. Aquatic Conservancy designation limits new in-water structures. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. Aquatic Conservancy designation limits new in-water structures. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
Mud Bay (MB) 1 3052 Marine Drive to 1910 Marine Dr (Bottom of Mud Bay) Proposed SED: Shoreline Residential Lots range in depth from 60 to 360 feet Building setbacks 33 to 233 feet Shoreline modifications: 25-65% in northern section, most 1-24%, southern section none.	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor buffers. Aquatic Conservancy designation limits new in-water structures. If docks are replaced, grating or other light penetration will be provided	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers and retain existing shoreline or substitute bulkheads with softer solutions. A few lots may replace bulkheads with softer solutions. Not likely to change sediment or substrate substantially. No change or positive change in ecological	Little change in present character of single family development in shoreline is likely. Aquatic Conservancy designation limits new in-water structures. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water	Little change in present character of single family development in shoreline is likely. Aquatic Conservancy designation limits new in-water structures. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers would benefit aquatic habitat through improved water quality. No change or positive change in ecological

Marine Shorelines					
	Freshwater Inputs and Tidal Flows	**Light energy or solar incidence**	**Sediment/Substrate Structure**	**Carbon Cycling/Water Quality**	**Aquatic and Terrestrial Habitat**
12 in-water structures Upland vegetation moderate Intertidal area extensive In-water vegetation: marsh, kelp, eelgrass		Not likely to substantially change light energy or solar incidence. No change or positive change in ecological functions	functions	quality benefits. No change or positive change in ecological functions	functions
Mud Bay (MB) 2 4366 Kelley Dr to 1385 NW Swiftshore Ct. (mouth of Mud Bay) Proposed SED: Shoreline Residential Existing: Semi-Rural (Kitsap County) Lots range in depth from 120 to 570 feet Building setbacks 50 to 185 feet Shoreline modifications: very limited 5 in-water structures Upland vegetation extensive Intertidal area extensive In-water vegetation: marsh, kelp	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor buffers. Aquatic Conservancy designation limits new in-water structures. If docks are replaced, grating or other light penetration will be provided Not likely to substantially change light energy or solar incidence. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers and retain existing shoreline or substitute bulkheads with softer solutions. A few lots may replace bulkheads with softer solutions. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. Aquatic Conservancy designation limits new in-water structures. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. Aquatic Conservancy designation limits new in-water structures. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
Ostrich Bay (OstB) 6 1385 NW Swiftshore Ct to 3544 Mathews Dr NW (Tip of Rocky Pt.) Proposed SED: Shoreline Residential Existing: Semi-Rural (Kitsap County) Building setbacks 0 to 233 feet Shoreline modifications: mixed--mostly 76-100%, some areas with none 7 in-water structures Upland vegetation limited Intertidal area moderate In-water vegetation: marsh, kelp, sargassum, eelgrass	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor buffers. If docks are replaced, grating or other light penetration will be provided Not likely to substantially change light energy or solar incidence. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may replace bulkheads with softer solutions. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
Phinney Bay (PB) 1 3532 Mathews Dr NW to 2710 Yacht Haven Wy Shoreline Residential Proposed SED: Shoreline Residential Existing: Semi-Rural (Kitsap County) Lots range in depth from 240 to 1020 feet Building setbacks 0 to 233 feet Shoreline modifications: mixed--mostly 76-100%, some areas with none 8 in-water structures Upland vegetation limited Intertidal area moderate In-water vegetation: marsh, kelp, sargassum, eelgrass	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor buffers. If docks are replaced, grating or other light penetration will be provided Not likely to substantially change light energy or solar incidence. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may replace bulkheads with softer solutions. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
Phinney Bay (PB) 2 2700 Yacht Haven Way (Bremerton Yacht Club) Proposed SED: Shoreline Residential Existing: Semi-Rural (Kitsap County) Shoreline linear feet 1000 Lots size 105,415 square feet, Lot depth 200 feet Building setbacks 0 feet Shoreline modifications: 76-100% 157 slips, 2 additional in-water structures	If substantial redevelopment of marina occurs it would likely result in little or no degradation and may result in minor improvements to hydrology by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Not likely to change freshwater inputs. No change or positive change in ecological functions	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Likely that SMP 20.16.820 Docks, Piers, and in-water structures, 20.16.750 Marinas and Boating Facilities, and: 20.16.760 Recreational Development would increase light penetration of existing and proposed facilities.	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Softer shoreline stabilization may be included as mitigation and increased sediment recruitment and transport. No change or positive change in ecological functions	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements to water quality by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater vegetated buffers may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides and upgrade of parking to meet current stormwater treatment requirements may result in water quality benefits. No change or positive change in ecological	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements to hydrology by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater setbacks of buildings & vegetated buffers vegetated buffers would benefit aquatic habitat through improved water quality. No benefits to terrestrial habitat likely. No change or positive change in ecological functions

Marine Shorelines					
	Freshwater Inputs and Tidal Flows	**Light energy or solar incidence**	**Sediment/Substrate Structure**	**Carbon Cycling/Water Quality**	**Aquatic and Terrestrial Habitat**
Upland vegetation limited Intertidal area west shore=extensive, east shore=limited In-water vegetation: marsh		No change or positive change in ecological functions		functions	
Phinney Bay (BP) 3 4105 NW Kennedy Dr to 3680 NW Phinney Bay Rd (Include Shaw Island) Proposed SED: Shoreline Residential Existing: Semi-Rural (Kitsap County) Lot depth 60 to 540 feet Building setbacks 50 to 150 feet Shoreline modification: 76-100% 5 in-water structures Upland vegetation moderate-extensive Intertidal area North=extensive, south=moderate In-water vegetation: marsh, eelgrass	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor buffers. Aquatic Conservancy designation limits new in-water structures. If docks are replaced, grating or other light penetration will be provided Not likely to substantially change light energy or solar incidence. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers and retain existing shoreline or substitute bulkheads with softer solutions. A few lots may replace bulkheads with softer solutions. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. Aquatic Conservancy designation limits new in-water structures. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. Aquatic Conservancy designation limits new in-water structures. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
Phinney Bay (PB) 4 3432 NW Phinney Bay Rd to NW 3317 Phinney Bay Rd Proposed SED: Shoreline Residential Existing: Semi-Rural (Kitsap County) Shoreline modification: 76-100% 0 in-water structures Upland vegetation limited Intertidal area moderate In-water vegetation: marsh, eelgrass	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor buffers. Aquatic Conservancy designation limits new in-water structures. If docks are replaced, grating or other light penetration will be provided Not likely to substantially change light energy or solar incidence. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers and retain existing shoreline or substitute bulkheads with softer solutions. A few lots may replace bulkheads with softer solutions. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. Aquatic Conservancy designation limits new in-water structures. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. Aquatic Conservancy designation limits new in-water structures. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
Phinney Bay (PB) 5 3304 Phinney to 2715 N Lafayette Ave Proposed SED: Shoreline Residential Lots range in depth from 40 to 915 feet Building setbacks 25 to 150 feet Shoreline modification: west side= 76-100%, east side=25-65% and some lower 6 in-water structures Upland vegetation moderate Intertidal area limited In-water vegetation: marsh, kelp, eelgrass	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor buffers. If docks are replaced, grating or other light penetration will be provided Not likely to substantially change light energy or solar incidence. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may replace bulkheads with softer solutions. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
West Port Washington Narrows (WPWN) 1 2710 N Lafayette Ave to 3200 19th Street (Lot 5, Block 4 Anderson Cove 1st Add) Proposed SED: Shoreline Residential Lots range in depth from 40 to 915 feet Building setbacks 25 to 150 feet Shoreline modification: west side= 76-100%, east side=25-65% and some lower 10 in-water structures Upland vegetation moderate Intertidal area limited	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor buffers. If docks are replaced, grating or other light penetration will be provided Not likely to substantially change light energy or solar incidence. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may replace bulkheads with softer solutions. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions

Marine Shorelines					
	Freshwater Inputs and Tidal Flows	**Light energy or solar incidence**	**Sediment/Substrate Structure**	**Carbon Cycling/Water Quality**	**Aquatic and Terrestrial Habitat**
In-water vegetation: marsh, kelp, eelgrass					
West Port Washington Narrows (WPWN) 2 (Anderson Cove) 1900 Naval Ave Port Washington Marina Proposed SED: Parallel Residential and Shoreline Recreation for marina Port Washington Marina Shoreline linear feet 600 Lots size 124,581.6 square feet, Lot ranges in depth from 112.5 to 37.5 feet Building setbacks 0 to 133 feet Shoreline modification: 76-100% About 85 slips in-water structures Upland vegetation extensive Intertidal area limited In-water vegetation: none	If substantial redevelopment of marina occurs it would likely result in little or no degradation and may result in minor improvements to hydrology by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Not likely to change freshwater inputs. No change or positive change in ecological functions	If substantial redevelopment of marina occurs it would likely result in little or no degradation and may result in minor improvements to hydrology by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Likely that SMP 20.16.820 Docks, Piers, and in-water structures, 20.16.750 Marinas and Boating Facilities, and: 20.16.760 Recreational Development would increase light penetration of existing and proposed facilities. It is unlikely that the upland multi-family development will change substantially No change or positive change in ecological functions	If substantial redevelopment of marina occurs it would likely result in little or no degradation and may result in minor improvements to hydrology by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. It is unlikely that the upland multi-family development will change substantially No change or positive change in ecological functions	If substantial redevelopment of marina occurs it would likely result in little or no degradation and may result in minor improvements to water quality by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. It is unlikely that the upland multi-family development will change substantially Some improvement could occur to water quality. No change or positive change in ecological functions	If substantial redevelopment of marina occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. It is unlikely that the upland multi-family development will change substantially Some aquatic habitat improvement could occur. No benefits to terrestrial habitat likely. No change or positive change in ecological functions
West Port Washington Narrows (WPWN) 3 (Anderson Cove) 1805 Thompson to High Ave Proposed SED: Shoreline Industrial Shoreline linear feet 133 Lots size 28,314 square feet, Lot depth 75 feet Shoreline modification: 76-100% 0 in-water structures Upland vegetation extensive Intertidal area limited In-water vegetation: none	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor improvements to hydrology by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor improvements to buffers and minor increase in shoreline shading by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings might result in softer shoreline stabilization and increased sediment recruitment and transport. No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings & vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings & vegetated buffers vegetated buffers would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
West Port Washington Narrows (WPWN) 4 1731 High Ave to Warren Ave Bridge Proposed SED: Shoreline Residential Lots range in depth from 80 to 330 feet Building setbacks 0 to 160 feet Shoreline modification: area with none, but mostly 25-65% 1 in-water structure (not including Warren Ave Bridge) Upland vegetation extensive Intertidal area moderate In-water vegetation: kelp	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor buffers. If docks are replaced, grating or other light penetration will be provided Not likely to substantially change light energy or solar incidence. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may replace bulkheads with softer solutions. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
West Port Washington Narrows (WPWN) 5 Both sides Warren Bridge Roto-Vista Park Proposed SED: Shoreline Recreation Roto-Vista Park	If substantial redevelopment of the park occurs it would likely result in little or no degradation and may result in minor improvements to hydrology by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Not likely to change freshwater inputs. No change or positive change in ecological functions	If substantial redevelopment of the park occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. No change or positive change in ecological functions	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Softer shoreline stabilization may be included as mitigation and increased sediment recruitment and transport. No change or positive change in ecological functions	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements to water quality by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater vegetated buffers may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides and upgrade of parking to meet current stormwater treatment requirements may result in water quality benefits. No change or positive change in ecological	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater setbacks of buildings & vegetated buffers vegetated buffers would benefit aquatic habitat through improved water quality. No benefits to terrestrial habitat likely. No change or positive change in ecological functions

Marine Shorelines					
	Freshwater Inputs and Tidal Flows	**Light energy or solar incidence**	**Sediment/Substrate Structure**	**Carbon Cycling/Water Quality**	**Aquatic and Terrestrial Habitat**
				functions	
West Port Washington Narrows (WPWN) 6 Warren Ave Bridge to 710 Park Dr. Proposed SED: Shoreline Residential Number of Lots 9 5.64 acres lots range in depth from 60 to 690 feet Building setbacks 0 to 300 feet Shoreline modification: 76-100% 0 in-water structures (not including bridge) Upland vegetation limited Intertidal area limited In-water vegetation: kelp	This area of existing multi-family development has virtually no buffers and is heavily armored. It is unlikely that redevelopment will be proposed that loses existing non-conforming status. If new development or substantial redevelopment of sites occurs, it will likely result in little or no degradation and will likely result in minor improvements to hydrology by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor improvements to buffers and minor increase in shoreline shading by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings might result in softer shoreline stabilization and increased sediment recruitment and transport. No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings & vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor improvements to hydrology by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use No change or positive change in ecological functions
West Port Washington Narrows (WPWN) 7 Evergreen Park Proposed SED: Shoreline Recreation Park size 13.39 acres Building setbacks 33 to 367 feet Shoreline modification: 76-100% 1 in-water structure Upland vegetation limited Intertidal area moderate In-water vegetation: kelp	If substantial redevelopment of the park occurs it would likely result in little or no degradation and may result in minor improvements to hydrology by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Not likely to change freshwater inputs. No change or positive change in ecological functions	If substantial redevelopment of the park occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. No change or positive change in ecological functions	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Softer shoreline stabilization may be included as mitigation and increased sediment recruitment and transport. No change or positive change in ecological functions	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements to water quality by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater vegetated buffers may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides and upgrade of parking to meet current stormwater treatment requirements may result in water quality benefits. No change or positive change in ecological functions	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater setbacks of buildings & vegetated buffers vegetated buffers would benefit aquatic habitat through improved water quality. No benefits to terrestrial habitat likely. No change or positive change in ecological functions
West Port Washington Narrows WPWN) 8 Evergreen Park to Manette Bridge Proposed SED: Shoreline Multi-Family (upland zoning is Downtown Regional Center Subarea Zoning MR-1 Multi-Family Residential 1) Urban Commercial Lots range in depth from 100 to 180 feet Building setbacks 20 to 70 feet Shoreline modification: 76-100% 1 in-water structure (not including bridge) Upland vegetation extensive Intertidal area limited In-water vegetation: kelp	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor buffers. If docks are replaced, grating or other light penetration will be provided Not likely to substantially change light energy or solar incidence. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may replace bulkheads with softer solutions. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
West Port Washington Narrows (WPWN) 9 Both sides of Manette Bridge Proposed SED: Shoreline Recreation	If substantial redevelopment of the park occurs it would likely result in little or no degradation and may result in minor improvements to hydrology by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Not likely to change freshwater inputs. No change or positive change in ecological functions	If substantial redevelopment of the park occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. No change or positive change in ecological functions	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Softer shoreline stabilization may be included as mitigation and increased sediment recruitment and transport. No change or positive change in ecological functions	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements to water quality by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater vegetated buffers may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides and upgrade of parking to meet current stormwater treatment requirements may result in water quality benefits.	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements to hydrology by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater setbacks of buildings & vegetated buffers vegetated buffers would benefit aquatic habitat through improved water quality. No benefits to terrestrial habitat likely. No change or positive change in ecological

Marine Shorelines					
	Freshwater Inputs and Tidal Flows	**Light energy or solar incidence**	**Sediment/Substrate Structure**	**Carbon Cycling/Water Quality**	**Aquatic and Terrestrial Habitat**
				No change or positive change in ecological functions	functions
West Port Washington Narrows WPWN) 10 Manette Bridge to 608 Washington Ave (6th Street) Proposed SED: Downtown Shoreline Multi-Family (upland zoning is Downtown Regional Center Subarea Zoning MR-1 Multi-Family Residential 1) Lots range in depth from 60 to 210 feet Building setbacks 0 to 114 feet Shoreline modification: 25-65% 0 in-water structure (not including bridge) Upland vegetation extensive Intertidal area limited In-water vegetation: kelp	It is likely that this area of mixed single and multi-family development will be replaced by larger scale multi-family projects. It would be subject to SMP 20.16.630 – Mitigation Sequencing for No Net Loss of Ecological Function impacts would be addressed and mitigated. The location on a high bank, however would result in preservation of the bluffs and existing vegetation. Not likely to change freshwater inputs. No change or positive change in ecological functions	With replacement of this area of mixed single and multi-family development by larger scale multi-family projects under the provisions of SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function impacts would be addressed and mitigated. The location on a high bank however would result in preservation of the bluffs and existing vegetation. There would, however likely be no change to light inputs. No change or positive change in ecological functions	With replacement of this area of mixed single and multi-family development by larger scale multi-family projects under the provisions of SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function impacts would be addressed and mitigated. Softer shoreline stabilization may be included as mitigation and increased sediment recruitment and transport. No change or positive change in ecological functions	With replacement of this area of mixed single and multi-family development by larger scale multi-family projects under the provisions of SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function impacts would be addressed and mitigated. Greater vegetated buffers may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides and upgrade of parking to meet current stormwater treatment requirements may result in water quality benefits. No change or positive change in ecological functions	With replacement of this area of mixed single and multi-family development by larger scale multi-family projects under the provisions of SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function impacts would be addressed and mitigated. Greater setbacks of buildings & vegetated buffers vegetated buffers would benefit aquatic habitat through improved water quality. No benefits to terrestrial habitat likely. No change or positive change in ecological functions
Sinclair Inlet (SI) 1 6th Street to Puget Sound Naval Shipyard Proposed SED: Downtown Waterfront Linear feet 1860 2 vacant lots, 0.09 total acres Lots range in depth from 70 to 206 feet Building setbacks 0 to 57 feet Shoreline modification: 25-65% 4 in-water structures, additionally about 300 slips Upland vegetation limited Intertidal area limited In-water vegetation: kelp	It is likely that the few remaining developable lots will be replaced by larger scale multi-use projects. It would be subject to SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function impacts would be addressed and mitigated. The location on a high bank however would result in preservation of the bluffs and existing vegetation. Not likely to change freshwater inputs. No change or positive change in ecological functions	With replacement of the few remaining developable lots by larger scale multi-use projects. under the provisions of SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function impacts would be addressed and mitigated. The location on a high bank however would result in preservation of the bluffs and existing vegetation. There would, however likely be no change to light inputs. No change or positive change in ecological functions	With replacement of the few remaining developable lots by larger scale multi-use projects. under the provisions of SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function impacts would be addressed and mitigated. Softer shoreline stabilization may be included as mitigation and increased sediment recruitment and transport. No change or positive change in ecological functions	With replacement of the few remaining developable lots by larger scale multi-use projects. under the provisions of SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function impacts would be addressed and mitigated. Greater vegetated buffers may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides and upgrade of parking to meet current stormwater treatment requirements may result in water quality benefits. No change or positive change in ecological functions	With replacement of the few remaining developable lots by larger scale multi-use projects. under the provisions of SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function impacts would be addressed and mitigated. Greater setbacks of buildings & vegetated buffers vegetated buffers would benefit aquatic habitat through improved water quality. No benefits to terrestrial habitat likely. No change or positive change in ecological functions
Sinclair Inlet (SI2) Puget Sound Naval Shipyard Proposed SED: Shoreline Industrial Urban Industrial Parcel 397.47 acres 19,625 linear feet of shoreline (11,000 excluding docks) Shoreline modification: 100% Upland vegetation none Intertidal area limited In-water vegetation: none	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan. Any major changes would be subject to SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function impacts would be addressed and mitigated. No change in ecological functions.	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan including SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function which requires impacts to be addressed and mitigated. No change in ecological functions.	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan including SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function which requires impacts to be addressed and mitigated. No change in ecological functions.	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan including SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function which requires impacts to be addressed and mitigated. No change in ecological functions.	Little change in present character of development is likely within shoreline. US Navy actions must comply with SMP as part of the CZM plan including SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function which requires impacts to be addressed and mitigated. No change in ecological functions..
Sinclair Inlet (SI) 3 Puget Sound Naval Shipyard boundary to, but not including 3958 SR 16 West Proposed SED: Parallel designations Waterward of Naval RR and SR 3, at point at which RR and SR 3 diverge, follows SR 3 – Urban Conservancy Upland of SR 3 – Shoreline Excluded Urban (Kitsap County) Shoreline linear feet 7,000 to 3015 SR 3; 11,500 to 3958 SR 16 Shoreline modification: 76-100% 0 in-water structures Upland vegetation (upland side) moderate	The narrow shoreline area between SR 3 and the Navy RR and the shoreline is not likely to see development. Most of the area was subject to a previous restoration program and is protected. Any action in this area would be subject to SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function. Impacts would be addressed and mitigated. Upland of SR 3 future development is isolated from the shoreline by a major highway and railroad. Proximity impacts are unlikely. Development would meet applicable stormwater management requirements.	Little change in present character of development is likely given the narrow strip of shoreline and previous restoration activities. Any action would be subject to SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function. Impacts would be addressed and mitigated. No change in ecological functions.	Little change in present character of development is likely given the narrow strip of shoreline and previous restoration activities. Any action would be subject to SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function. Impacts would be addressed and mitigated. No change in ecological functions.	Little change in present character of development is likely given the narrow strip of shoreline and previous restoration activities. Any action would be subject to SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function. Impacts would be addressed and mitigated. No change in ecological functions.	Little change in present character of development is likely given the narrow strip of shoreline and previous restoration activities. Any action would be subject to SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function. Impacts would be addressed and mitigated. No change in ecological functions.

Marine Shorelines					
	Freshwater Inputs and Tidal Flows	**Light energy or solar incidence**	**Sediment/Substrate Structure**	**Carbon Cycling/Water Quality**	**Aquatic and Terrestrial Habitat**
Intertidal area limited most of the reach In-water vegetation: none identified	No change in ecological functions.				
Sinclair Inlet (SI) 4 3958 SR 16 West to 3650 SR 16 SW Proposed SED: Parallel designations Waterward of Building setback– Urban Conservancy, Landward of Building Setback - Commercial Urban (Kitsap County) Shoreline length 1,300 feet Number of commercial lots – 6 Commercial lot acres – 13.23 Lots range in depth from 35 to 300 feet Building setbacks 30 to 314 feet Shoreline modification: 76-100% 0 in-water structures Upland vegetation limited Intertidal area extensive In-water vegetation: marsh	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor improvements to hydrology by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use The Urban Conservancy designation from the building setback assures buffers, however little change to freshwater inputs of tidal flows would occur. No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor improvements to buffers and minor increase in shoreline shading by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use The Urban Conservancy designation from the building setback assures buffers, however only minor change to solar incidence would be expected. No change or positive change in ecological functions No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use The Urban Conservancy designation from the building setback assures buffers, and might result in softer shoreline stabilization and increased sediment recruitment and transport. No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings & vegetated buffers may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings & vegetated buffers vegetated buffers would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
Sinclair Inlet (SI) 4 3050 SR 16 SW Sinclair Inlet Wildlife Area Proposed SED: Urban Conservancy Shoreline length 800 feet Upland vegetation limited Intertidal area extensive In-water vegetation: marsh	No change in this wildlife area is anticipated. No change in ecological functions.	No change in this wildlife area is anticipated. No change in ecological functions.	No change in this wildlife area is anticipated. No change in ecological functions.	No change in this wildlife area is anticipated. No change in ecological functions.	No change in this wildlife area is anticipated. No change in ecological functions.
Sinclair Inlet (SI) 5 2800 SR 16 SW Elandan Gardens Proposed SED: Parallel designations Waterward of Building setback– Urban Conservancy, Landward of Building Setback - Commercial Former landfill Shoreline length – 250 Parcel size – 1.53 acres Building setback 588 feet Shoreline modification: 76-100% 0 in-water structures Upland vegetation extensive Intertidal area extensive In-water vegetation: marsh	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor improvements to hydrology by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use The Urban Conservancy designation from the building setback assures buffers, however little change to freshwater inputs of tidal flows would occur. No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor improvements to buffers and minor increase in shoreline shading by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use The Urban Conservancy designation from the building setback assures buffers, however only minor change to solar incidence would be expected. No change or positive change in ecological functions No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use The Urban Conservancy designation from the building setback assures buffers, and might result in softer shoreline stabilization and increased sediment recruitment and transport. No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings & vegetated buffers may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings & vegetated buffers vegetated buffers would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
Sinclair Inlet (SI) 6 2800 SR 16 SW east of Elandan Gardens Proposed SED: Urban Conservancy East of former landfill Shoreline length – 500' Shoreline modification: 0% 0 in-water structures Upland vegetation narrow adjacent to road	This narrow shoreline area adjacent to the roadway has little or no potential for change, unless the roads were widened. Any action in this area would be subject to SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function. Impacts would be addressed and mitigated. No change in ecological functions.	This narrow shoreline area adjacent to the roadway has little or no potential for change, unless the roads were widened. Any action in this area would be subject to SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function. Impacts would be addressed and mitigated. No change in ecological functions.	This narrow shoreline area adjacent to the roadway has little or no potential for change, unless the roads were widened. Any action in this area would be subject to SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function. Impacts would be addressed and mitigated. No change in ecological functions.	This narrow shoreline area adjacent to the roadway has little or no potential for change, unless the roads were widened. Any action in this area would be subject to SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function. Impacts would be addressed and mitigated. No change in ecological functions.	This narrow shoreline area adjacent to the roadway has little or no potential for change, unless the roads were widened. Any action in this area would be subject to SMP 20.16.630 Mitigation Sequencing for No Net Loss of Ecological Function. Impacts would be addressed and mitigated. No change in ecological functions.

Marine Shorelines					
	Freshwater Inputs and Tidal Flows	**Light energy or solar incidence**	**Sediment/Substrate Structure**	**Carbon Cycling/Water Quality**	**Aquatic and Terrestrial Habitat**
Intertidal area extensive In-water vegetation: marsh					
East Port Washington Narrows (EPWN) 1 Riddell Road to 3845 Tracy Beach Rd Proposed SED: Shoreline Residential Rural (Kitsap County) Lots range in depth from 180 to 615 feet Building setbacks 30 to 486 feet Shoreline modification: 76-100% 1 in-water structure Upland vegetation limited Intertidal area moderate In-water vegetation: marsh	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor buffers. If docks are replaced, grating or other light penetration will be provided Not likely to substantially change light energy or solar incidence. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers and retain existing shoreline or substitute bulkheads with softer solutions. A few lots may replace bulkheads with softer solutions. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may be subdividable and would provide buffers. A few lots may redevelop or remodel and provide minor vegetated buffers would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
East Port Washington Narrows (EPWN) 2 3765 Tracy Beach Rd Sheridan Road Proposed SED: Parallel designation Waterward of Road – Urban Conservancy Upland of Road – Shoreline Residential Shoreline length 4,900 Average road setback from OHWM 30 feet Shoreline modification: 76-100% 1 in-water structure Upland vegetation moderate Intertidal area moderate In-water vegetation: kelp	Urban Conservancy designation would retain existing shoreline functions. New residential development on the upland side of the road would have few shoreline impacts with stormwater and other development standards. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Urban Conservancy designation would retain existing shoreline functions. New residential development on the upland side of the road would not be likely to substantially change light energy or solar incidence. No change in ecological functions	Urban Conservancy designation would retain existing shoreline functions. New residential development on the upland side of the road would not be likely to change sediment or substrate. No change in ecological functions	Urban Conservancy designation would retain existing shoreline functions. New residential development on the upland side of the road would not be likely to result in water quality impacts with stormwater and other development standards. No change in ecological functions	Urban Conservancy designation would presumably retain existing shoreline functions. New residential development on the upland side of the road would displace current terrestrial habitat, however lack of connectivity would result in minor impact. No change in ecological functions
East Port Washington Narrows (EPWN) 3 Sheridan Road to 2475 Stephenson Ave Lions Park Proposed SED: Shoreline Recreation Park size 19.11 acres Waterfront 2,000 linear feet Building setbacks 10 to 570 feet Shoreline modification: limited 2 in-water structures Upland vegetation limited Intertidal area moderate In-water vegetation: kelp	If substantial redevelopment of the park occurs it would likely result in little or no degradation and may result in minor improvements to hydrology by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Not likely to change freshwater inputs. No change or positive change in ecological functions	If substantial redevelopment of the park occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. No change or positive change in ecological functions	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Softer shoreline stabilization may be included as mitigation and increased sediment recruitment and transport. No change or positive change in ecological functions	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements to water quality by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater vegetated buffers may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides and upgrade of parking to meet current stormwater treatment requirements may result in water quality benefits. No change or positive change in ecological functions	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements to hydrology by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater setbacks of buildings & vegetated buffers vegetated buffers would benefit aquatic habitat through improved water quality. No benefits to terrestrial habitat likely. No change or positive change in ecological functions
East Port Washington Narrows (EPWN) 4 2506 Stephenson Ave to Sheridan Park Proposed SED: Shoreline Residential Lots range in depth from 171 to 371 feet Building setbacks 71 to 257 feet Shoreline modification: 25-65% 0 in-water structure (not including bridge) Upland vegetation moderate-extensive Intertidal area moderate In-water vegetation: kelp	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor buffers. If docks are replaced, grating or other light penetration will be provided Not likely to substantially change light energy or solar incidence. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may replace bulkheads with softer solutions. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
East Port Washington Narrows (EPWN) 4 Sheridan Park Warren Bridge Theater Proposed SED:	The Theater and park/overlook at the top of the bluff are likely to remain. If substantial redevelopment of the park or theater occurs it would likely result in little or no degradation and may result in minor	The Theater and park/overlook at the top of the bluff are likely to remain. If substantial redevelopment of the park or theater occurs it would likely result in little or no degradation and may result in minor improvements by	The Theater and park/overlook at the top of the bluff are likely to remain. If substantial redevelopment of the park or theater occurs it would likely result in little or no degradation and may result in minor improvements by application	The Theater and park/overlook at the top of the bluff are likely to remain. If substantial redevelopment of the park or theater occurs it would likely result in little or no degradation and may result in minor improvements to water	The Theater and park/overlook at the top of the bluff are likely to remain. If substantial redevelopment of the park or theater occurs it would likely result in little or no degradation and may result in minor improvements to hydrology

Marine Shorelines					
	Freshwater Inputs and Tidal Flows	**Light energy or solar incidence**	**Sediment/Substrate Structure**	**Carbon Cycling/Water Quality**	**Aquatic and Terrestrial Habitat**
Parallel TOS Setback Upland Commercial below TOS is Urban Conservancy Park size 5.6 acres Waterfront 790 linear feet Building setback 228 feet Shoreline modification: 1-25% 0 in-water structures Upland vegetation extensive Intertidal area limited In-water vegetation: kelp	improvements to hydrology by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Not likely to change freshwater inputs. No change or positive change in ecological functions	application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. No change or positive change in ecological functions	of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Softer shoreline stabilization may be included as mitigation and increased sediment recruitment and transport. No change or positive change in ecological functions	quality by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater vegetated buffers may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides and upgrade of parking to meet current stormwater treatment requirements may result in water quality benefits. No change or positive change in ecological functions	by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater setbacks of buildings & vegetated buffers vegetated buffers would benefit aquatic habitat through improved water quality. No benefits to terrestrial habitat likely. No change or positive change in ecological functions
East Port Washington Narrows (EPWN) 5 1107 Campbell Wy to 1921 Wheaton Way Proposed SED: Parallel Upland Shoreline Commercial Below TOS Setback Urban Conservancy Shoreline length 1,800 feet Misc. services lots 4; 1.52 acres Sheds and garages lots: 1; 1.39 acres Number of residential lots 10 Undeveloped lots: 5 Recreational lots: 1 Lots range in depth from 34 to 172 feet Building setbacks 57 to 187 feet Shoreline modification: 1-25% 0 in-water structures Upland vegetation extensive Intertidal area moderate In-water vegetation: kelp	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor improvements to hydrology by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use The Urban Conservancy designation from the building setback assures buffers, however little change to freshwater inputs of tidal flows would occur. No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor improvements to buffers and minor increase in shoreline shading by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use The Urban Conservancy designation from the building setback assures buffers, however only minor change to solar incidence would be expected. No change or positive change in ecological functions No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use The Urban Conservancy designation from the building setback assures buffers, and might result in softer shoreline stabilization and increased sediment recruitment and transport. No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings & vegetated buffers may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	New development and substantial redevelopment of sites will likely result in little or no degradation and will likely result in minor enhancement by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings & vegetated buffers vegetated buffers would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
East Port Washington Narrows (EPWN) 5 East of 1921 Wheaton to Manette Bridge (includes CCR – City Core Residential and Manette Subarea R-10 zoning) Proposed SED: Shoreline Multi-Family Residential Lots range in depth from 70 to 640 feet Building setbacks 0 to 486 feet Shoreline modification: mostly 76-100% 0 in-water structure Upland vegetation limited Intertidal area limited In-water vegetation: kelp, sargassum	The most extensive probable redevelopment area is the Bremerton Gardens multi-family community between Magnuson Way and 16th Street. Substantial redevelopment would likely result in little or no degradation and may result in minor improvements to hydrology by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Buffers and a stormwater system that meets current standards may improve freshwater inputs from the stream that runs through the property and through LID approaches that increase infiltration and interflow. Other multi-family development in the reach is less likely to redevelop. No change or positive change in ecological functions	The redevelopment of Bremerton Gardens would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function, but is unlikely to change solar incidence. No change or positive change in ecological functions	The redevelopment of Bremerton Gardens would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function, but is unlikely to change solar Greater building setbacks and softer shoreline stabilization may be included as mitigation and increased sediment recruitment and transport. No change or positive change in ecological functions	The redevelopment of Bremerton Gardens would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function, but is unlikely to change solar Greater vegetated buffers may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides and upgrade of parking to meet current stormwater treatment requirements may result in water quality benefits. No change or positive change in ecological functions	The redevelopment of Bremerton Gardens would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function, but is unlikely to change solar Greater setbacks of buildings & vegetated buffers vegetated buffers would benefit aquatic habitat through improved water quality. No benefits to terrestrial habitat likely. No change or positive change in ecological functions
East Port Washington Narrows (EPWN) 7 Manette Bridge both sides Proposed SED: Shoreline Recreation	Little change in this small park is expected. If substantial redevelopment of the park occurs it would likely result in little or no degradation and may result in minor improvements to hydrology by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Not likely to change freshwater inputs. No change or positive change in ecological	If substantial redevelopment of the park occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. No change or positive change in ecological functions	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Softer shoreline stabilization may be included as mitigation and increased sediment recruitment and transport. No change or positive change in ecological	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements to water quality by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater vegetated buffers may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides and upgrade of parking to meet	If substantial redevelopment occurs it would likely result in little or no degradation and may result in minor improvements to hydrology by application of SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function. Greater setbacks of buildings & vegetated buffers vegetated buffers would benefit aquatic habitat through improved water quality. No

Marine Shorelines					
	Freshwater Inputs and Tidal Flows	**Light energy or solar incidence**	**Sediment/Substrate Structure**	**Carbon Cycling/Water Quality**	**Aquatic and Terrestrial Habitat**
	functions		functions	current stormwater treatment requirements may result in water quality benefits. No change or positive change in ecological functions	benefits to terrestrial habitat likely. No change or positive change in ecological functions
East Port Washington Narrows (EPWN) 8 Manette Bridge to 201 Shore Dr Proposed SED: Shoreline Commercial Manette Subarea NCC-Neighborhood Center Core) length 466 feet Number of commercial lots – 3 Commercial lot acres – 0.41 Number of residential lots- 1 Zoned Communications: 1 lot, 0.09 acres Zoned 370-50+ units: 1 lot, 0.87 acres Lots about 100 feet deep Building setbacks about 0 feet Shoreline modification: 76-100% 2 in-water structures Upland vegetation limited Intertidal area limited In-water vegetation: sargassum	These commercial and multi-family buildings are directly adjacent to the shoreline with heavy shoreline armoring. It is likely that the buildings or shoreline features will change in the foreseeable future. If new development or substantial redevelopment were to occur, it likely would result in little or no degradation by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Given the urbanized upland, there likely would be no effect on freshwater inputs of tidal flows. No change ecological functions	If new development or substantial redevelopment were to occur, it likely would result in little or no degradation by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use The existing pier in the reach likely would be reduced in size and incorporate grating or other light penetration at such time as it were substantially repaired or reconstructed. No change or positive change in ecological functions	If new development or substantial redevelopment were to occur, it likely would result in little or no degradation by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use It is, however, unlikely that substantial change would be made to shoreline armoring, given the high energy marine environment. No change or positive change in ecological functions	If new development or substantial redevelopment were to occur, it likely would result in little or no degradation by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use Greater setbacks of buildings & vegetated buffers would be difficult to accommodate without substantially reducing the buildable area of site. No change in ecological functions	If new development or substantial redevelopment were to occur, it likely would result in little or no degradation by application of: • SMP 20.16.630 –Mitigation Sequencing for No Net Loss of Ecological Function and • SMP 20.16.720.b.5, & 20.16.740.b.4 which provides for ecological restoration of non-water-dependent commercial and industrial use If the dock were reduced in size and/or incorporated light penetration it would benefit aquatic. No change or positive change in ecological functions
Port Orchard Bay (POB) 1 211 Shore Drive to 711 Shore Drive Proposed SED: Shoreline Residential Lots range in depth from 77 to 120 feet Building setbacks 0 to 60 feet Shoreline modification: 76-100% 1 in-water structure Upland vegetation limited Intertidal area moderate In-water vegetation: sargassum	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers, however lots are so small and existing setbacks so small that very small buffers are practical. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor buffers but they are not likely to affect or resulting impacts on beach desiccation. No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may replace bulkheads with softer solutions although the high energy wave environment limits this potential. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
Port Orchard Bay (POB) 2 805 Shore Drive to 1151 Shore Drive Proposed SED: Shoreline Residential Average lot depth about 120 feet Building setbacks 0 to 30 feet Shoreline modification: 76-100% 1 in-water structure Upland vegetation limited Intertidal area moderate In-water vegetation: sargassum	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers, however lots are so small and existing setbacks so small that very small buffers are practical. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor buffers but they are not likely to provide shade or change resulting impacts on beach desiccation. No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may replace bulkheads with softer solutions although the high energy wave environment limits this potential. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
Port Orchard Bay (POB) 3 1334 Jacobson Blvd to 1926 Jacobson Ln Proposed SED: Shoreline Residential Semi-Rural (Kitsap County) Lots range in depth from 195 to 345 feet Building setbacks 0 to 215 feet Shoreline modification: 25-65% 1 in-water structure Upland vegetation limited Intertidal area moderate In-water vegetation: sargassum	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers. Lots in this area are large with a range of setbacks. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor buffers. The lack of requirement for large trees would limit beneficial impacts of shade on beach desiccation. No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may replace bulkheads with softer solutions although the high energy wave environment limits this potential. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
Port Orchard Bay (POB) 4	Little change in present character of single	Little change in present character of single	Little change in present character of single	Little change in present character of single	Little change in present character of single

Marine Shorelines					
	Freshwater Inputs and Tidal Flows	**Light energy or solar incidence**	**Sediment/Substrate Structure**	**Carbon Cycling/Water Quality**	**Aquatic and Terrestrial Habitat**
1938 Jacobson Blvd to 2504 NE Enetai Beach Rd Proposed SED: Shoreline Residential Semi-Rural (Kitsap County) Lots range in depth from 300 to 1020 feet Building setbacks 5 to 86 feet Shoreline modification: 1-24% 3 in-water structures Upland vegetation extensive, but not directly adjacent to shore Intertidal area moderate In-water vegetation: kelp, sargassum	family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers. Lots in this area are large with a range of setbacks. Not likely to change freshwater inputs of tidal flows No change in ecological functions	family development in shoreline is likely. A few lots may redevelop or remodel and provide minor buffers. The lack of requirement for large trees would limit beneficial impacts of shade on beach desiccation. No change in ecological functions	family development in shoreline is likely. A few lots may replace bulkheads with softer solutions although the high energy wave environment limits this potential. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions
Port Orchard Bay (POB) 5 2700 NE Enatai Beach Rd to (but not including 3735) Bahia Vista Drive Proposed SED: Urban Conservancy Conservancy (Kitsap County) Lots range in depth from 120 to 960 feet Building setbacks 130 to 428 feet Shoreline modification: 76-100%, with section of none 1 in-water structures Upland vegetation extensive Intertidal area moderate In-water vegetation: kelp, sargassum	This area is likely to subdivide in the future. Density will likely depend on provision of water and sewer service. Urban Conservancy designation and residential development standards in SMP 20.16.770 will likely result in development clustered away from the shoreline with substantial buffers. Existing freshwater inputs from surface water and interflow are likely to be preserved. No change in ecological functions	Subdivision in the future with Urban Conservancy designation and development standards is likely to preserve the existing extensive tree cover and preserve shading and microclimate conditions that make beaches a productive habitat area. No change in ecological functions	Subdivision in the future with Urban Conservancy designation and development standards is likely to preserve the existing unarmored shoreline and continue natural sediment recruitment, transport and deposition maintaining productive ecological functions. No change ecological functions	Subdivision in the future with Urban Conservancy designation and development standards is likely to preserve the existing extensive tree cover and preserve water quality and nutrient cycling that maintains ecological productivity. . No change in ecological functions	Subdivision in the future with Urban Conservancy designation and development standards is likely to preserve aquatic habitat. Preservation of terrestrial habitat will require effective upland connections to other habitat areas. No change in ecological functions
Port Orchard Bay (POB) 6 3735 Bahia Vista Drive to Illahee State Park Proposed SED: Shoreline Residential Rural (Kitsap County) Lots range in depth from 342 to 457 feet Building setbacks 5 to 143 feet Shoreline modification: 76-100% 1 in-water structure Upland vegetation limited directly upland from shore, extensive upland from houses Intertidal area moderate In-water vegetation: kelp, sargassum	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers. Lots in this area are large with a range of setbacks. Not likely to change freshwater inputs of tidal flows No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor buffers. The lack of requirement for large trees would limit beneficial impacts of shade on beach desiccation. No change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may replace bulkheads with softer solutions although the high energy wave environment limits this potential. Not likely to change sediment or substrate substantially. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which may reduce nutrients and toxic discharge from fertilizers, herbicides & pesticides with water quality benefits. No change or positive change in ecological functions	Little change in present character of single family development in shoreline is likely. A few lots may redevelop or remodel and provide minor vegetated buffers which would benefit aquatic habitat through improved water quality. No change or positive change in ecological functions