

**City of Black Diamond
Grant No. G1000014**

DRAFT

**PRELIMINARY CUMULATIVE IMPACTS ANALYSIS
COMPONENT for City of Black Diamond Shoreline:
Lake Sawyer**

**Project Title: Shoreline Master Program Update
Phase 3, Task 3.6: Preliminary Cumulative Impacts Analysis**

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TABLE OF CONTENTS

<u>Section</u>	<u>Page No.</u>
TABLE OF CONTENTS	i
1.0 INTRODUCTION	2
1.1 Department of Ecology direction and Guidance	2
1.2 Relationship to SEPA	3
1.3 Assumptions	4
1.4 Document roadmap	4
2.0 EXISTING CONDITIONS	5
2.1 Shoreline environments	5
2.2 Land use	5
2.3 Parks and open space/public access	6
2.4 Shoreline modifications	6
2.5 Impervious Coverage	8
2.6 Biological resources and critical areas	10
3.0 REGULATORY FRAMEWORK	14
3.1 CITY OF BLACK DIAMOND	14
3.1.1 Shoreline Master Program	14
3.1.2 Comprehensive Plan	15
3.1.3 Comprehensive Parks Plan	15
3.1.4 Environmentally Sensitive Areas Ordinance	16
3.2 STATE AND FEDERAL REGULATIONS	16
4.0 FUTURE DEVELOPMENT AND ECOLOGICAL FUNCTIONS AT RISK	16
4.1 Patterns of shoreline development	16
4.2 Ecological Functions and Processes At Risk	17
4.2.1 Hydrologic Functions	17
4.2.2 Shoreline Vegetation Functions	19
4.2.3 Hyporheic Functions	19
4.2.4 Habitat Functions	20
4.3 Potential for Future Development	21
4.3.1 Segment A – Residential	21
4.3.2 Segment B – Lake Sawyer Park Boat Launch	26
4.3.3 Segment C – Forested Single Family Parcel	26
4.3.4 Segment D – Islands	29
4.3.5 Segment E – Lake Sawyer Regional Park and Adjacent Residential	30
4.3.6 Segment F – Lake Sawyer Regional Park Wetland	32
4.3.7 Summary of Potential Future Development	32
5.0 SMP PROVISIONS AND IMPACT ASSESSMENT	35
5.1 General Goals, Policies, and Regulations	35
5.2 General Cumulative Impacts Assessment	36
5.2.1 Segment A – Residential	36
5.2.2 Segment B – Lake Sawyer Park Boat Launch	40
5.2.3 Segment C – Forested Single Family Parcel	43
5.2.4 Segment D – Islands	45
5.2.5 Segment E – Lake Sawyer Regional Park and Adjacent Residential	46
5.2.6 Segment F – Lake Sawyer Regional Park Wetland	50
5.2.7 Summary of Cumulative Impacts	51

1.0 INTRODUCTION

1.1 DEPARTMENT OF ECOLOGY DIRECTION AND GUIDANCE

The Shoreline Management Act guidelines require local shoreline master programs to regulate new development to “achieve no net loss of ecological function.” The guidelines (WAC 173-26-186(8)(d)) state that, “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.”

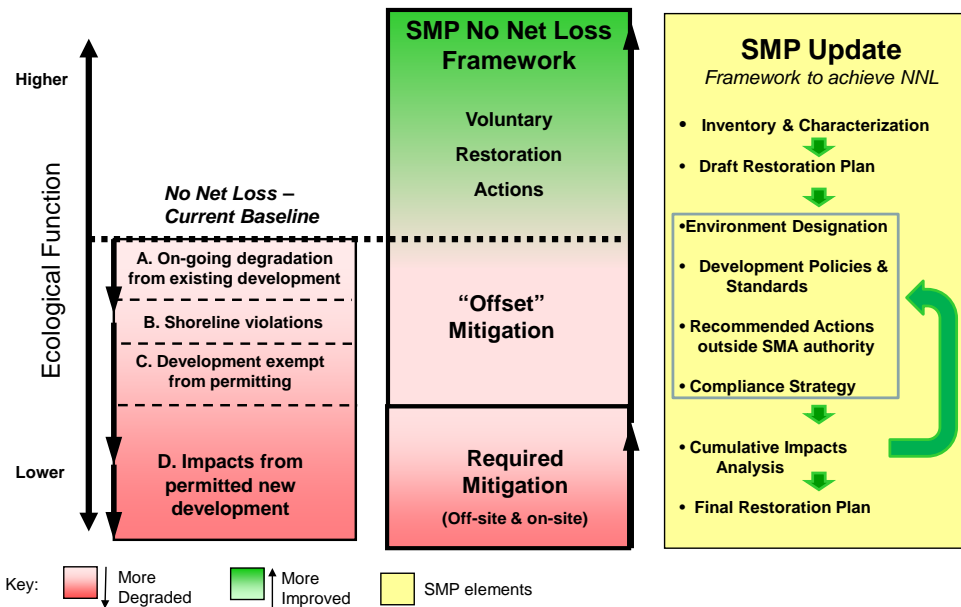
The guidelines further elaborate on the concept of net loss as follows:

“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.” [WAC 173-206-201(2)(c)]

In short, updated SMPs shall contain goals, policies and regulations that prevent degradation of ecological functions relative to the existing conditions as documented in that jurisdiction’s characterization and analysis report. For those projects that result in degradation of ecological functions, the required mitigation must return the resultant ecological function back to the baseline. This is illustrated in the figure below. The jurisdiction must be able to demonstrate that it has accomplished that goal through an analysis of cumulative impacts that might occur through implementation of the updated SMP. Evaluation of such cumulative impacts should consider:

- (i) current circumstances affecting the shorelines and relevant natural processes;
- (ii) reasonably foreseeable future development and use of the shoreline; and
- (iii) beneficial effects of any established regulatory programs under other local, state, and federal laws.”

SMP Updates: Achieving No Net Loss of Ecological Function



Source: Department of Ecology

As outlined in the *Shoreline Restoration Plan* prepared as part of this SMP update, the SMA also seeks to restore ecological functions in degraded shorelines. This cannot be required by the SMP at a project level, but Section 173-26-201(2)(f) of the Guidelines says: “master programs shall include goals and policies that provide for restoration of such impaired ecological functions.” See the *Shoreline Restoration Plan* for additional discussion of SMP policies and other programs and activities in the City of Black Diamond that contribute to the long-term restoration of ecological functions relative to the baseline condition.

The following document summarizes for each shoreline environment (see Map Folio, Figure 1) the existing conditions, anticipated development, relevant Shoreline Master Program (SMP) and other regulatory provisions, and the expected net impact on ecological function.

1.2 RELATIONSHIP TO SEPA

The State Environmental Protection Act (SEPA) requires an assessment of environmental impacts. This cumulative impact analysis is a supplement to the environmental review done under SEPA and is intended to focus on an expanded analysis of cumulative that might not otherwise be considered at the same level of detail as part of the environmental checklist.

The SEPA review process is intended to provide a list of possible environmental impacts that may occur as a result of a project or change in policy. This helps identify potential impacts that may need to be mitigated, conditioned, or that may even result in the denial of a project or proposal. This cumulative impact analysis is intended to look at impacts as a whole on the basis of whether or not multiple similar projects collectively result in gradual, but significant impacts.

1.3 ASSUMPTIONS

This analysis examines foreseeable impacts over time. Impacts are examined in each of the shoreline management areas. The shoreline management areas used in this analysis also correspond with the segments that were previously analyzed in the Black Diamond Shoreline Analysis Report for alterations to key processes. Site specific impacts are also expected to be addressed on a case-by-case basis during individual shoreline substantial development permit reviews.

Due to current and proposed land use regulations and the extensively developed nature of the Lake Sawyer shoreline, it is assumed that a limited number of properties have significant redevelopment potential. The two most significant of these properties are at the north end of the lake (Segment C – Forested Single-Family Parcel) and at the south end of the lake, immediately north of the Lake Sawyer Regional Park (owned by a private party and currently used as a sports field). A complete discussion of vacant residential lots with subdivision potential that would have the potential for the creation of new lots within the Shoreline Management Area is included in Chapter 4. The majority of areas along Lake Sawyer are likely to see relatively slow and incremental changes associated with on-going uses, as well as redevelopment and expansion of existing uses. Limited new development may occur on currently vacant lots and where parcels are eligible for subdivision. Because of the developed nature of the shoreline, redevelopment is not expected to result in negative ecological impacts. Because many existing structures were built under older, less stringent standards, redevelopment can be expected to improve overall ecological function over the long term due to the application of new development standards that require a higher level of environmental protection, strictly regulate new shoreline modifications, and offer incentives for shoreline restoration. This is discussed in detail in this document.

1.4 DOCUMENT ROADMAP

This cumulative impacts analysis:

- Summarizes the existing conditions in each of the shoreline management areas;
- Identifies anticipated development in each shoreline segment and how the proposed SMP regulations would address this development;
- Discusses how other local, state and federal regulations would address potential impacts;
- Details the potential impacts and risks to shoreline functions and processes; and
- Describes the net effect on ecological functions and processes.

A cumulative impacts analysis table is included in Chapter 5 that describes the relationship between ecological function, potential alteration, resources at risk, proposed SMP regulations and non-regulatory measures designed to assure no net loss at a minimum. In addition, this table provides a summary of the anticipated net change in ecological performance for each shoreline analysis segment.

2.0 EXISTING CONDITIONS

The following summary of existing conditions in the Lake Sawyer shoreline area and the relevant natural processes is based on the Final Shoreline Analysis Report (Otak/AHBL, August 2010), and additional analysis needed to perform this assessment. The full report includes a more in-depth discussion of the topics briefly summarized in this section.

2.1 SHORELINE ENVIRONMENTS

Approximately 69.52% of the upland shoreline jurisdiction is proposed to be designated as the Shoreline Residential Environment, the majority of which is currently developed as low density single family residences. Approximately 14.99% of the upland shoreline jurisdiction is proposed to be designated as Urban Conservancy, approximately 1.41% as Shoreline Residential Limited and approximately 14.08% as Natural.

Table 1: Area and Shoreline Frontages of Shoreline Planning Segments

	Area (ac)	Shoreline Frontage (ft)	Percent of SMA Area
Segment A – Shoreline Residential	115.2	24,738.4	65.16%
–Segment B – Urban Conservancy	2.1	539.7	1.19%
–Segment C – Shoreline Residential	7.7	1,814.0	4.36%
Segment D – Shoreline Residential Limited	2.5	2,415.1	1.41%
Segment E – Urban Conservancy	24.4	5,497.8	13.80%
Segment F – Natural	24.9	N/A	14.08%
TOTAL	176.8	35,005	100%

2.2 LAND USE

The majority of shoreline properties surrounding Lake Sawyer are developed as private single-family residential uses. Existing residential development accounts for approximately 57.5 percent of the acreage of the proposed shoreline jurisdiction. Parks and publicly owned land account for approximately 23.5 percent of the shoreline jurisdiction; these lands are concentrated in Lake Sawyer Regional Park at the south end of the lake. A small city park containing a boat ramp is also located on the northwest side of the lake, at the end of SE 296th Street. Other land uses within the shoreline jurisdiction include mobile homes, a lakeside resort with recreation areas and RV parking, and vacant lots. The Lake Sawyer shoreline is mostly built out, and vacant land accounts for only 7.6 percent of the shoreline jurisdiction acreage.

2.3 PARKS AND OPEN SPACE/PUBLIC ACCESS

As described in Section 2.2 – Land Use, parks and open space account for approximately 24 percent of the land in the shoreline environment. The majority of this land is concentrated at the southern end of the lake, where the City owns the Lake Sawyer Regional Park, which provides walking trails, non-motorized shoreline access, and passive recreation. The site is currently undeveloped. The City also owns a small park on the northwest side of the lake, at the end of SE 296th Street, which features the only public boat ramp on the lake, as well as boat trailer parking and picnic facilities.

2.4 SHORELINE MODIFICATIONS

Aerial photography and site observation indicates that the shoreline of Lake Sawyer has been extensively modified, including construction of docks, piers, and various forms of shoreline armoring. Approximately 66 percent of the shoreline edge has been armored, and approximately 90 percent of shoreline parcels have some kind of overwater structure. Major areas of unarmored shoreline are located on several small islands within the lake, a large forested parcel at the north end of the lake, and a portion of the regional park shoreline at the southern end of the lake.

Shoreline modifications, such as armoring and overwater structures, can alter the hydrologic functions of the lake edge, leading to changes in erosion patterns, sediment transport, and aquatic vegetation distribution. Overwater structures can affect aquatic vegetation growth and fish behavior and feeding patterns. More detailed discussion of shoreline modifications in each of the shoreline analysis segments is provided below.

Segment A: Residential

As described in the Shoreline Analysis Report, this inventory segment is the largest in the shoreline environment, encompassing 65.16 percent of the shoreline area and characterized by shoreline residential uses on waterfront lots. The shoreline in this segment has been heavily modified, most notably in the form of bulkheads to protect residences from wave action. Approximately 80 percent of the shoreline in this segment has been armored with a variety of materials, including poured concrete, concrete blocks, boulders, and wood.

Overwater structures, such as floating swimming platforms, piers, and boat docks, are also very common. Approximately 291 parcels in Segment A have docks, piers, or floating platforms, or have access to them through joint use with adjacent parcels. This represents approximately 90.4 percent of the shoreline parcels in Segment A. The remaining 31 lots do not have a moorage structure or access to a moorage structure. Based on data from the Washington Department of Natural Resources, these overwater structures cover approximately 154,727 square feet, or approximately 3.6 acres.

Many of the primary residential structures in Segment A are constructed quite close to the shoreline. The Shoreline Analysis Report included an initial analysis of the median setback distance for all structures within the shoreline jurisdiction, which was approximately 57 feet. This analysis has been refined and updated to focus only on primary residential structures. A

review of building footprint data and aerial photography indicated that approximately 112 primary structures in Segment A are located within 40 feet of the OHWM, which is the proposed standard setback in the SMP for the Shoreline Residential environment. Of these, 67 structures are located within the proposed 20-foot minimum setback. The remaining 155 structures within Segment A lie more than 40 feet from the shoreline, outside the proposed maximum setback. The median setback is approximately 48.7 feet based on available data. However, the mapped location of the ordinary high water mark does not always correspond well with the apparent shoreline edge in aerial photos and therefore we believe this number may not accurately reflect the true median setback.

Comment [g1]: How many within 25 feet

Segment B: Lake Sawyer Park Boat Launch

As described in the Shoreline Analysis Report, this inventory segment consists of the City-owned boat launch park on the northwestern side of Lake Sawyer and accounts for 1.19 percent of the shoreline area. The boat ramp and its associated modifications account for approximately 12 percent of the shoreline in this segment, leaving the majority of the shoreline in a semi-natural state. Shoreline protection in these areas consists of logs tethered together and placed at or just beyond the OHWM.

Segment C: Forested Single Family Parcel

As described in the Shoreline Analysis Report, this inventory segment consists of a single, 12.9-acre parcel on the northern shore of Lake Sawyer. 7.7 acres of the site are within the shoreline jurisdiction, and this segment accounts for approximately 4.36 percent of the total shoreline area in the city. The property forms a point in the lake, and some limited armoring is present at this location. Three docks are present; however, the majority of the shoreline on the site has been left in its natural state with large amounts of vegetation overhanging the water. The site is currently occupied by three structures, one of which is approximately 6 feet from the OHWM, which is inside the proposed 2025-foot minimum setback for the Shoreline Residential environment. Another structure is approximately 103 feet from the OHWM, putting it well beyond the 40-foot standard setback distance proposed in the SMP. The presence of the third structure has been confirmed visually, but not specific data is not available from the King County Assessor or other sources.

Segment D: Islands

Lake Sawyer contains four small islands that are platted with parcels. These islands are accessible only by boat and have no roads. Two of the islands are platted as one parcel each, one is platted as two parcels (under common ownership), and the largest island contains seven parcels. The two-parcel island on the west side of the lake is heavily forested and appears to be completely undeveloped. The larger of the two eastern islands appears to have two docks, and aerial photography indicates that there may be a structure on the island, though dense trees make identification difficult. King County Assessor records do not list any structures for this parcel, and no improvements have been assessed. The southeastern island is very small, approximately 8,200 square feet, and aerial photos indicate that no docks or structures are present.

The shoreline of the largest island is much more extensively modified than those of the other three. The northern half of the island is a single parcel and appears to have only one dock, leaving most of its shoreline undisturbed. The southern half of the island is divided in to six parcels that are developed with homes, decks, and docks constructed very close to the shoreline. Several of the cabins and decks may actually be built partially over the water.

Segment E: Lake Sawyer Regional Park

While the Lake Sawyer Regional Park is mostly undeveloped and is used for passive recreation, approximately 50 percent of the park shoreline has been modified. Modifications include armoring with timbers and boulders, as well as four corrugated metal culverts that allow Rock Creek and Ravensdale Creek to flow under an access road, but no docks, piers, or other overwater structures are present.

Segment F: Lake Sawyer Regional Park Wetland

As described in the Shoreline Analysis Report, this portion of the regional park consists of a large wetland complex located southeast of the Lake Sawyer shoreline. While physically separated from the lake by upland passive recreation areas, the wetland complex is connected to Lake Sawyer by Rock Creek, which flows through the wetland and into the lake via the culverts described in Segment E. No shoreline armoring, overwater structures or improvements other than rustic trails are present in this segment.

2.5 IMPERVIOUS COVERAGE

Impervious surface coverage for each segment was analyzed by reviewing land cover data from Washington Department of Ecology. This land cover data was generated from Landsat imagery, which has several limitations. Because the data is collected by satellite, image resolution is relatively low; each pixel is approximately 30 square meters. A satellite's view of the ground is also often obstructed in various ways, such as by cloud cover, vegetation, or man-made structures. In the case of impervious coverage data, dense vegetation can mask the presence of buildings, roads, or other impervious surfaces. Because of these limitations, Landsat data is best suited for calculations of broad trends over large areas.

Due to the coarse resolution of the data available (30m), it is not possible to accurately determine impervious surface at the parcel level; in many areas, parcels are smaller than the basic unit of the impervious cover dataset. Rather, impervious surface percentage is estimated over the entire analysis segment using a weighted average calculation method. Overall, it is estimated that the shoreline jurisdiction includes approximately 29.67 acres of impervious surface, which represents approximately 16.78% of the total acreage.

Segment A: Residential

Segment A consists primarily of low-intensity residential uses. Though this segment contains extensive shoreline modification and has experienced significant clearing of natural vegetation, overall impervious surface remains relatively low. While impervious cover on individual lots varies across the segment, the overall percentage of impervious surface for Segment A is approximately 24.6%. As described previously, the source data for this estimate is only

available at coarse resolutions, and this likely underestimates actual impervious surface coverage on the site. It is probable that some impervious areas, such as driveways, are not included in this estimate due to obscuring vegetation and the coarse resolution of the available data. Segment A contains approximately 318,860 square feet of right-of-way for public roads, equivalent to approximately 6.4% of the overall segment area.

Segment B: Lake Sawyer Park Boat Launch

Segment B consists of the Boat Launch Park. While the boat launch represents a localized concentration of impervious surface, it comprises a small proportion of the analysis segment. This segment also contains approximately 33,945 square feet of public right-of-way for SE 236th Street, which would account for a large portion of the impervious surface present. Overall, impervious coverage in Segment B is estimated to be approximately 9%.

Segment C: Forested Single Family Parcel

Segment C is heavily forested, and Landsat data shows no impervious surface in this Segment, though the extensive mature forest canopy on the site makes accurate identification of ground features difficult. Three structures have been visually identified on the site, as well as parking areas (gravel and compacted dirt) and a loop drive, all of which are located primarily in the shoreline jurisdiction. While the level of actual impervious surface (buildings, asphalt, concrete) is likely to be very low, effective impervious surface, which also includes gravel roads and parking areas and compacted dirt, is estimated to be roughly 10-15% of the Segment, though a survey would be necessary to confirm the size and distribution of these features on-site.

Segment D: Islands

Impervious surface coverage in Segment D is concentrated on the western island, which is currently developed with several residences. Due to the size of the lots and the resolution of the data available, it is difficult to estimate a precise amount of impervious surface in this area. Based on the area of the documented structures on site, coupled with the impervious surface data from Ecology, it is estimated that impervious coverage on the western island is between 20-26%; it is likely, however, that this data includes several overwater structures that are free-draining, which would make the effective impervious surface on this island slightly lower. Impervious coverage on the central and eastern islands appears to be negligible.

Segment E: Lake Sawyer Regional Park

Impervious cover in this analysis segment is extremely low, consisting of access roads and roadside parking areas. Total impervious coverage is estimated at approximately 2%, based on Landsat imagery. Effective impervious surface is likely to be slightly higher, due to the presence of areas of compacted soil, including an old road bed.

Segment F: Lake Sawyer Regional Park Wetland

Impervious cover in this analysis segment is extremely low, consisting of access roads and trails. Total impervious coverage is estimated at approximately 3%.

2.6 BIOLOGICAL RESOURCES AND CRITICAL AREAS

An extensive discussion of the biological resources and environmentally critical areas present in the shoreline jurisdiction is included in the Shoreline Analysis Report. A summary of conditions for each of the inventory segments is presented in Table 2.

Table 2. Summary of Biological Resources and Critical Areas Conditions

Analysis Segment	Wetlands/Streams	Geologically Hazardous Areas	Critical Aquifer Recharge Areas and Wellhead Protection Zones	Priority Habitat Species
Segment A (Residential)	<ul style="list-style-type: none"> No documented wetlands present in Segment A. Covington Creek and part of its stream buffer are located in the western portion of Segment A. 	<ul style="list-style-type: none"> Slopes greater than 40% are common in Segment A, though the overall area is relatively small (6.1 acres) in comparison to the size of the segment. Portions of Segment A that have very few steep slopes include the far northwest corner of the lake and those properties on the Covington Creek inlet. The majority of remaining residential parcels contain some area of steep slope, as illustrated in the Shoreline Analysis Report. These areas generally run parallel to the shoreline, often between existing structures and the OHWL. 	<ul style="list-style-type: none"> Portions of Segment A fall within two wellhead protection zones on the east and west sides of the lake. The shoreline jurisdiction crosses the 5- and 10-Year zones for these wellheads. 	<ul style="list-style-type: none"> Portions of Segment A located south of SE 304th Street are within WDFW Bald Eagle Nest buffers. Covington Creek is listed as habitat for Coastal Cutthroat, Winter Steelhead, and Coho salmon. Covington Creek is also designated as critical habitat for federally listed, threatened, Puget Sound Chinook Salmon. Steelhead is a federally listed species whose presence is documented in Covington Creek and Lake Sawyer. Coho is a Species of Concern that is mapped as occurring in Lake Sawyer as well. All of Lake Sawyer is classified by WDFW as a waterfowl concentration location.
Segment B (Lake Sawyer Park Boat Launch)	<ul style="list-style-type: none"> No documented wetlands or streams are present in Segment B. 	<ul style="list-style-type: none"> This segment is relatively free of geological hazards. A small area (0.1 acre) of slope greater than 40% is located near the shoreline on the eastern half of the parcel. 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> All of Lake Sawyer is classified by WDFW as a waterfowl concentration location. See also PHS species above.
Segment C (Forested)	<ul style="list-style-type: none"> No documented wetlands or streams are present in Segment 	<ul style="list-style-type: none"> This segment contains a scattering of steep slope areas, clustered close to the 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> All of Lake Sawyer is classified by WDFW as a

Analysis Segment	Wetlands/Streams	Geologically Hazardous Areas	Critical Aquifer Recharge Areas and Wellhead Protection Zones	Priority Habitat Species
Single Family Parcel)	C.	shoreline. The overall area affected is approximately 0.13 acre.		waterfowl concentration location. See also above.
Segment D (Islands)	<ul style="list-style-type: none"> No documented wetlands or streams are present in Segment D. 	<ul style="list-style-type: none"> The islands contain scattered areas of steep slopes, concentrated near the shoreline. Most of the steep slope area on the developed island is located on the northern parcel. Steep slopes on the central island are grouped on the northern shoreline, and the eastern island has one small area of steep slope on the southwestern shore. Total area is approximately 0.05 acre. 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> All of Lake Sawyer is classified by WDFW as a waterfowl concentration location. See also PHS fish species above.
Segment E (Lake Sawyer Regional Park)	<ul style="list-style-type: none"> Ravensdale Creek and Rock Creek, streams not regulated under the Shoreline Management Act, cross the shoreline environment and enter Lake Sawyer through culverts located under an access road. 	<ul style="list-style-type: none"> This segment contains approximately 0.6 acre of steep slope areas, clustered mostly in forested areas in the central and southern portions of the reach, which are encompassed by the regional park. Approximately 42% of this segment lies within a Coal Mine Hazard Zone that encompasses most of the western portion of the regional park. The privately owned property north of the park is unaffected. 	<ul style="list-style-type: none"> None 	<ul style="list-style-type: none"> All of Segment E lies within WDFW Bald Eagle Nest buffers. Ravensdale Creek and Rock Creek are listed as habitat for Coastal Cutthroat and Coho salmon. Coho and Steelhead are also found in Lake Sawyer. All of Lake Sawyer is classified by WDFW as a waterfowl concentration location.

Analysis Segment	Wetlands/Streams	Geologically Hazardous Areas	Critical Aquifer Recharge Areas and Wellhead Protection Zones	Priority Habitat Species
Segment F (Lake Sawyer Regional Park Wetland)	<ul style="list-style-type: none"> • Rock Creek, enters Segment F at the southernmost point of the shoreline jurisdiction and empties into Lake Sawyer through a culvert under an access road in the regional park. • Segment F contains a 15-acre, Category 1 wetland complex associated with Rock Creek. The wetland itself is physically separated from the lake, but it is hydraulically connected through Rock Creek. 	<ul style="list-style-type: none"> • Segment F contains approximately 1.2 acres of steep slope areas, concentrated in the northeastern portion of the segment, north of the wetland complex. • The entirety of this segment lies within a Coal Mine Hazard Zone. 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Approximately the western half of Segment F lies within WDFW Bald Eagle Nest buffers. • Rock Creek is listed as habitat for Coastal Cutthroat and Coho salmon. Coho and Steelhead (federally listed) are also found in Lake Sawyer.

3.0 REGULATORY FRAMEWORK

3.1 CITY OF BLACK DIAMOND

3.1.1 Shoreline Master Program

The City of Black Diamond's Shoreline Master Program has been designed in consideration of the ways in which reasonably foreseeable development in the shoreline jurisdiction could negatively affect shoreline functions and processes. This subsection provides an overview of the master program and how it generally addresses protection of ecological functions. A detailed discussion of the impacts associated with adoption of the Shoreline Master Program policies and regulations is included in Section 5.

The core of the proposed SMP is the designation of five shoreline environments surrounding Lake Sawyer, described below:

Shoreline Residential

The Shoreline Residential environment is intended to provide for residential uses and appurtenances where necessary facilities can be provided, as well as provide appropriate public access and recreational use. This designation is applied to areas that are primarily single-family residential in character or which are planned for this purpose. This environment designation corresponds to Inventory Segment A, as described in Chapter 2.

Shoreline Residential Limited

The Shoreline Residential Limited environment is intended to recognize existing residential and recreational uses in areas where necessary facilities for development are not already provided. The Shoreline Residential Limited environment will provide for additional development in these locations once appropriate facilities and services, such as potable water, electricity, and waste disposal, are available. This environment designation is also intended to foster ecological enhancement. The Shoreline Residential Limited designation is currently applied to those parcels located on three islands in Lake Sawyer, corresponding to Inventory Segment D, as described in Chapter 2.

Urban Conservancy

The purpose of the Urban Conservancy environment is to protect and restore ecological functions of sensitive lands, such as open space and floodplains, where they exist in urban and developed areas. The Urban Conservancy environment includes the shorelands of the Lake Sawyer Boat Launch Park (Inventory Segment B) and those portions of the Lake Sawyer Regional Park not designated as wetlands (Inventory Segment E).

Natural

The Natural environment is designed to protect shoreline areas that are relatively free of human influence or that include intact or minimally degraded shoreline functions that are not compatible with human use. Natural shorelines require that only very low-intensity uses be allowed to preserve ecological function. This designation is applied to the wetlands within the Lake Sawyer

Regional Park associated with Rock Creek (Inventory Segment F), as well as one of the undeveloped islands in Lake Sawyer, where development is not feasible due to the small size of the island and other site characteristics.

Aquatic

The Aquatic environment exists to protect, restore, and manage the unique characteristics of the lands located waterward of the ordinary high water mark.

The proposed SMP contains policies and supporting regulations intended to protect the City's shorelines and ensure no net loss of current ecological function. Key policies and regulations are referenced in Chapter 5 as part of the analysis of potential impacts to specific ecological processes.

3.1.2 Comprehensive Plan

The City's Comprehensive Plan, updated in 2009, contains both Natural Environment and Land Use elements, which set forth goals and policies for the protection of sensitive environmental resources and shoreline areas, as well as establish the future land uses within the shoreline jurisdiction. Techniques proposed include updates to adopted stormwater regulations, requirements for all future development to connect to sanitary sewer, avoiding disturbance of valuable fish and wildlife habitat, creation of an open space system, and limitations on clearing and grading. These policies are implemented by the Black Diamond Municipal Code.

3.1.3 Comprehensive Parks Plan

The City of Black Diamond Comprehensive Parks Plan, adopted December 23, 2008, outlines the goals and policies that govern the development of public parks and recreational facilities. Currently, the City has insufficient developed parkland to meet its adopted level of service standards, and the Lake Sawyer Regional Park is identified as an opportunity area for reducing this deficit. While development of the regional park has the potential to adversely affect the shoreline, the Comprehensive Parks Plan includes the following Goals, Objectives, and Policies to protect environmental resources:

- Objective 4: Park design shall protect and improve the functions of the natural environment and strike a balance between public use and preservation.
 - Policy 4.1: Park design shall incorporate features that enhance the existing environment and educate users of the presence and functions of environmental amenities.
 - Policy 4.2: Development and maintenance of parklands shall utilize eco-friendly methods and products.
 - Policy 4.3: Park development and management shall, where appropriate, incorporate natural resource conservation, restoration, and preservation.
 - Policy 4.5: Design for new parks will minimize road construction and utilize low-impact engineering techniques to soften the imprint of roads and trails on the land.

3.1.4 Environmentally Sensitive Areas Ordinance

The City currently regulates Environmentally Sensitive Areas under Chapter 19.10 of its Municipal Code. These regulations were adopted in 2009 and are intended to designate and classify sensitive areas in order to limit development and alteration in these areas and to prevent adverse environmental impacts to sensitive areas. Sensitive areas regulations apply to the following types of areas:

- Wetlands,
- Fish and wildlife conservation areas,
- Geologically hazardous areas,
- Critical aquifer recharge areas, and
- Frequently flooded areas.

Those provisions of the Environmentally Sensitive Areas Ordinance that are applicable to the shoreline jurisdiction are incorporated into Chapter 3 of the proposed SMP.

3.2 STATE AND FEDERAL REGULATIONS

As described in detail in the Shoreline Analysis Report, development activities within the City's shoreline jurisdiction may be regulated under the following laws and regulations:

- Section 404 of the Clean Water Act;
- The Endangered Species Act;
- Section 401 Water Quality Certification; and
- Washington State Hydraulic Code.

Any development activity within the shoreline jurisdiction that takes place below the OHWM of a Water of the United States or a Water of the State will trigger the need for review by Federal or State agencies, respectively. Lake Sawyer is considered a Water of the State, and any action below the OHWM would therefore require a permit from the Department of Ecology. Section 2 of the Shoreline Analysis Report contains a detailed discussion of the applicability of these State and Federal regulations to development within the shoreline jurisdiction.

4.0 FUTURE DEVELOPMENT AND ECOLOGICAL FUNCTIONS AT RISK

Future development on the Lake Sawyer shoreline has the potential to impact ecological function. The goal of the Black Diamond Shoreline Master Program is to assure no net loss of existing ecological function. The following subsections describe the potential for future development in the shoreline jurisdiction and the ecological functions potential impacted by such development.

4.1 PATTERNS OF SHORELINE DEVELOPMENT

As discussed in the Shoreline Analysis Report, shoreline development on Lake Sawyer since 1998 has been characterized primarily by construction and modification of residential structures and related appurtenances such as bulkheads and piers, most of which were permitted as

Shoreline Exemptions. Table 3 presents the shoreline permit history for the city from 1998-2009, with the exception of 2004.

Table 3. Shoreline Permit History in the City of Black Diamond Since Incorporation

Year	Pier		Bulkhead Mod.	Upland Residential Structure	Upland Com/MF Structures	Utilities	Other	Permit Type			
	Extension / Mod.	New/ Replace						Exemption	SDP	CUP	Variance
1998	4	2	1	4				11			
1999	1	3		13				17			
2000	4	3	1	9		1	1	20			
2001	2	2		5		1	1	11			
2002	3			2				5			
2003	1	1		6			4	12			
2004											
2005		1	1	8				8	1		
2006	3	4		8			1	16			
2007			1	1				2			
2008		1		2			2	5			
2009		2	1	4			3	9			
TOTAL	18	19	5	62		2	12	116	1		

The trends shown in this permitting data indicate that development on the shorelines of Lake Sawyer is likely to continue being dominated by construction and modification of residential uses and their associated shoreline structures, such as bulkheads, docks, and piers.

4.2 ECOLOGICAL FUNCTIONS AND PROCESSES AT RISK

As described in the Shoreline Inventory Report, the shoreline of Lake Sawyer provides a range of ecological functions for hydrologic, vegetative, hyporheic, and habitat processes, which must be protected by the SMP. A detailed evaluation of the relative performance of each shoreline inventory segment with regard to these processes was included in the Shoreline Analysis Report, and the potential impacts to these functions from future development in each shoreline segment is analyzed in Chapter 5.3 – General Cumulative Impacts Assessment. Below is a general discussion of these ecological functions and how each function could potentially be impacted by future development.

4.2.1 Hydrologic Functions

Water and Sediment Storage

Lakes, by definition, provide capacity for water and sediment storage from stream flows and surface runoff. Lakes also have the potential to improve water quality by entrapping sediments that may contain toxic compounds. Surrounding uplands also have the potential for water and sediment storage, depending on the amount of vegetation present. Areas that have been

extensively cleared or converted to impervious surface provide little opportunity for water infiltration and storage. As such, development of shoreline areas that clears vegetation or creates new impervious surface has the potential to reduce water and sediment storage function. Development that includes Low Impact Development techniques, such as pervious pavement, bioretention, or green roofs, has the potential to mitigate impacts to these functions.

Attenuation of Wave Energy

Wave energy, generated either naturally by wind or by man-made sources such as watercraft, can cause shoreline erosion if not properly released. Wave energy from recreational activities, such as waterskiing and wakeboarding, is a significant concern on Lake Sawyer. Natural or “soft” shorelines that feature vegetation or accumulated organic material provide a buffer that attenuates wave energy and protects the shoreline from erosive forces. Modification of the shoreline to remove vegetation or organic material, including the installation of bulkheads and other forms of “hard” armoring, eliminates this attenuation effect. The result is the reflection of wave energy back into the lake and the amplification of erosive wave forces on those lake shorelines that are not protected, as well as the habitat loss associated with the clearing and fill necessary to install bulkheads. The presence of docks, piers, or other artificial in-water structures can also interfere with movement of sediments along the shoreline, altering substrate conditions. Development that would create new shoreline armoring, increase the presence of in-water structures, or would remove vegetation from the water’s edge has the potential to adversely affect the wave energy attenuation function of Lake Sawyer’s shorelines. Conversely, development that removes existing bulkheads or implements bio-engineered or natural shoreline protection measures can positively affect this function.

Removal of Excess Nutrients and Toxic Compounds

Upland areas often provide filtration of stormwater into adjacent water bodies by allowing runoff to infiltrate into the soil. Highly vegetated areas and wetlands provide the greatest potential for natural filtration, while impervious surfaces and areas cleared of vegetation provide little to no filtration capacity. Filtration of stormwater runoff improves water quality by removing excess nutrients and toxics generated by residential development, such as fertilizers, herbicides, hydrocarbons, petroleum, and discharges from on-site septic systems (OSS) that are not functioning properly. Overwater structures, such as docks, piers, or swimming platforms that use chemical treatments to prevent rot, such as creosote, can contribute to contamination of the water body, further reducing water quality. Development that increases the level of impervious surface coverage surrounding the lake or that removes native vegetation has the potential to adversely affect water quality by inhibiting filtration of runoff and preventing removal of these excess nutrients and toxic substances.

Recruitment of Large Woody Debris and Organic Material

As described under Attenuation of Wave Energy, the accumulation of large woody debris (LWD) and other organic material on lake shorelines aids the attenuation of wave energy, as well as providing habitat for fish and wildlife, as noted in Section 4.2.4 – Shoreline Habitat Functions. This organic material typically enters the lake from surrounding uplands either from stream flow or from organic debris that washes in from upland areas during storm events. Organic material also enters the lake when shoreline vegetation falls into the water because of death or bank erosion. The placement of obstructions at stream outlets, such as dams, weirs, or culverts, can reduce or eliminate recruitment of LWD from stream channels. Likewise, clearing of vegetation from surrounding upland areas, particularly areas immediately adjacent to the shoreline, can

reduce the amount of LWD and organic material that is recruited. Development that obstructs stream passages or clears shoreline vegetation can have an adverse effect on this function.

4.2.2 Shoreline Vegetation Functions

Temperature Regulation

Shoreline vegetation that overhangs streams and lakes can provide temperature regulation by shading the water and limiting the potential for solar gain in the water body. This function is important for streams but has a negligible impact for Lake Sawyer because lakes have large expanses of unshaded water in the center that reduce the relative contribution of shoreline shading to overall temperature regulation.

Improvement of Water Quality

As described in Section 4.2.1, the presence of shoreline vegetation provides filtering of stormwater runoff, which can remove excess nutrients and toxic compounds that originate in upland residential areas, such as fertilizers, herbicides, hydrocarbons, petroleum products, and septic overflows. Filtration of these substances improves the overall water quality of the lake. Removal of shoreline vegetation reduces this capacity for filtration, leading to potential decreases in water quality.

Attenuation of Wave Energy

As described in Section 4.2.1, vegetated shorelines provide “soft” shoreline protection and allow wave energy to be released, thereby reducing erosive effects on unprotected shorelines. Development that clears shoreline vegetation, removes accumulated organic debris, or installs new “hard” armoring reduces the ability of the shoreline to attenuate wave energy, while development that removes existing armoring or uses natural shoreline protection methods preserves this function.

Sediment Removal and Bank Stabilization

Natural conditions are characterized by an ongoing, underlying process of shoreline erosion that acts to maintain substrate conditions. The introduction of bulkheads and armoring stabilizes the shoreline but limits the natural recruitment of lakebed materials.

Recruitment of Large Woody Debris and Organic Material

As described in Section 4.2.1, the accumulation of large woody debris and other organic material aids the attenuation of wave energy. Stream outlet obstructions and clearing of vegetation reduces the overall amount of organic material recruited. Shoreline vegetation also provides habitat benefits by offering forage and cover for wildlife, as described in Section 4.2.4 – Shoreline Habitat Functions.

4.2.3 Hyporheic Functions

The hyporheic zone is a transitional region between groundwater and surface water and represents the interface between terrestrial and aquatic ecosystems. Hyporheic functions in Lake Sawyer include the following:

Removal of Excess Nutrients and Toxic Compounds

As described in the Shoreline Analysis Report, the area where groundwater and surface water exchange has potential to provide removal of excess nutrients and toxics, though the effectiveness of this function varies by soil type and substrate conditions. In general, portions of the shoreline with impervious surface have a reduced potential for runoff infiltration and

filtering, and shoreline bulkheads act as a barrier to water exchange between surface water and groundwater.

Water Storage

As described in the Shoreline Analysis Report, the exchange zone between surface water and groundwater can provide water storage, but this function is depended on soil type, groundwater level, and impervious coverage. Under natural conditions, groundwater stored in the upland soils would discharge into the lake on a seasonal basis, providing surface water recharge. The presence of impervious coverage prevents stormwater infiltration, precluding subsurface recharge. Bulkheads along the shoreline also inhibit recharge by creating a barrier to subsurface water exchange.

Vegetation Support

Under natural conditions, shallow groundwater at the lake's edge can support a riparian vegetation community. Residential development surrounding the lake that includes construction of shoreline armoring, backfilling, or compaction of soils reduces the availability of groundwater at the lake's edge and precludes the establishment of riparian vegetation communities.

Maintenance of Base Flows

The contribution of groundwater-surface water exchange in the hyporheic zone to base flows can vary depending on soil conditions and grades, but shoreline armoring, including bulkheading, generally has a negative effect on this function as it presents a barrier to water exchange.

4.2.4 Habitat Functions

Physical Space and Conditions for Life History

Under natural conditions, the near-shore environment provides valuable habitat for aquatic species, including den sites, spawning grounds, and rearing and foraging areas. Upland vegetation provides cover, food, and nesting sites for terrestrial species. Modification of the shoreline, specifically armoring, can create deeper, more turbulent near-shore conditions that are inhospitable to aquatic species. Deep water adjacent to the shoreline also allows larger predatory fish to prey on young fish. Armoring of the shoreline also frequently involves removal of shoreline vegetation, which eliminates cover and habitat for terrestrial species. The presence of overwater structures can also alter natural patterns of light transmission into the water column, which can affect growth and behavior of aquatic organisms. Artificial lighting installed on docks and piers has also been shown to affect fish movement patterns. This is of particular concern in the Lake Sawyer shoreline management area due to the documented presence of federally listed steelhead in the lake and in Rock Creek.

Food Production and Delivery

Upland riparian areas, including emergent wetlands, often provide food for a variety of species. Residential development of the shoreline and the installation of shoreline armoring greatly reduce the potential for the shoreline to provide foraging areas for both aquatic and terrestrial species. While some domestic plants, such as fruit trees or garden plants, can supply food for wildlife, the function is diminished compared to natural conditions. Food production and delivery can also be affected by the presence of overwater structures, which alter the natural patterns of lighting and may interfere with the growth of aquatic vegetation.

4.3 POTENTIAL FOR FUTURE DEVELOPMENT

As described in the Shoreline Analysis Report, future development on the Lake Sawyer shoreline is anticipated to consist primarily of single-family residential development. Due to the small amount of vacant land along the shoreline, future development activity is anticipated to consist mostly of the remodeling, expansion, or redevelopment of existing single-family residences, as well as limited construction of new residences on the few vacant parcels in the area and vacant and developed parcels that may become eligible for subdivision when sanitary sewer service is available. As discussed in the Shoreline Analysis Report, demand for single-family residential development in this area is high; therefore, very few, if any, current residential uses are anticipated to be converted to other uses.

4.3.1 Segment A – Residential

Anticipated Changes in Land Use

Given that the majority of this segment is zoned for low-density residential development, no significant conversion of existing residences to other uses is anticipated. Existing residences are likely to expand or redevelop to larger homes, and the few vacant lots are expected to develop with single-family residences.

Likely Development and Implications for Shoreline Management

Redevelopment of Existing Properties

As described in Chapter 2, Segment A is extensively developed for residential uses. However, many of these residences are small vacation homes and cabins that have the potential to expand in the future, resulting in the redevelopment of these existing properties with larger primary residences. The Sunrise RV Resort on the western shore of the lake also has limited potential for additional development in its present use, based on requirements in the proposed SMP, though it would be possible to convert this property to single-family use if sanitary sewer service were extended to the site. The potential for single-family development on this property is described in more detail in the discussion of potential development associated with land subdivision.

Additional development or redevelopment could include expansion of related appurtenances, such as parking areas and driveways, and could potentially increase the amount of impervious surface on each parcel. As described in Section 4.2, increased impervious surface coverage can impact various ecological functions, including water and sediment storage, as well as water quality. Redevelopment also has the potential to improve ecological function because most development in this area was built under outdated or nonexistent standards. Impervious surface coverage is capped in the Shoreline Residential environment at 40% of site area, and the SMP management policies for the Shoreline Residential environment require the use of Low Impact Development (LID) techniques to the greatest extent feasible. These techniques include use pervious pavement, reduction of impervious surfaces, infiltration of runoff, and other techniques that can minimize water quality and water storage impacts and in some cases improve ecological functions compared to existing conditions in this Segment.

Development of Vacant Properties

In addition to redevelopment of existing properties, new development could occur on currently vacant lots. Review of King County Assessor data revealed 8 vacant lots in the shoreline jurisdiction that are below the minimum lot size required to be eligible for subdivision. Of these 8 lots, 6 currently have shoreline frontage. Each lot is allowed to construct a single dwelling unit, subject to the development regulations included in the SMP. Development of these parcels would result in the clearing of on-site vegetation, increased impervious surface coverage, and additional overwater cover for those lots with shoreline access. However, the SMP limits impervious cover in the Shoreline Residential environment to 40% of site area and requires development to implement all feasible LID techniques, which have the potential to reduce water quality impacts. The SMP also includes vegetation preservation standards to minimize impacts from clearing of shoreline and upland vegetation.

In summary, development of currently vacant properties within Segment A would produce up to 8 new residences and up to 6 new developed shoreline frontages.

New Lots from Subdivision

Review of parcels within the shoreline jurisdiction indicates that there is limited potential for lot subdivision in Segment A. Based on the minimum lot size for the R4 zone (BDMC 18.30.040.A.1.a), 107 parcels are currently large enough to be subdivided; 3 are vacant, and 104 are developed. Although the SMP currently prohibits subdivision of lots in areas where sanitary sewer is not yet available, which constitutes the vast majority of the Lake Sawyer shoreline, as discussed in the Shoreline Analysis Report, this discussion assumes the eventual provision of services to all areas of the shoreline jurisdiction.

The analysis of subdivision potential in this document focuses on basic requirements, such as lot size and width, under standard code requirements. [Please note that new subdivision standards have been added to the proposed SMP to address potential impacts \(see Chapter 4, Residential Uses\).](#) ~~However~~ [In addition](#), there are many other standards and conditions that can influence the ability of property owner to subdivide and the resulting lot yield. It should be noted that BDMC 18.86 also allows “cluster development”, in which lot sizes could be reduced to 6000 sq. ft. and other lot dimensional standards varied. So, a large property (such as Sunrise Resort) could potentially result in more lots within the shoreline jurisdiction than could occur under the standard requirements of the R4 zone. However, given the strict requirements of the proposed SMP, it is more likely that development would be clustered outside of the SMA and shoreline areas retained in common recreational open space to meet the requirement for no net loss of ecological function. ~~We recommend that if the cluster provisions are included in the SMP, we should specifically state that they cannot be used to increase the number of lots that could be created in the SMA when compared to the yield that would be provided under the “standard” rules.~~

Comment [g2]: BDMC 18.86.040.A.1 already says density cannot be increased

Vacant Parcels

Of the 3 vacant lots large enough for subdivision, two have shoreline frontage greater than 120 feet, which is double the minimum width in the R4 zone under current zoning, as well as the proposed shoreline frontage standard in the Draft SMP. These lots could therefore be subdivided to create additional lots with shoreline frontage. Based on the minimum shoreline frontage of 60 feet, these 2 vacant lots could be subdivided to create up to 5 new parcels for a total of 7 shoreline frontage lots. However, review of site conditions for these parcels, including lot shape

and available site access, indicates that full subdivision is probably not feasible and that no more than 5 total lots are likely to be created, all of which would have shoreline frontage.

The remaining vacant lot meets the minimum size standard for subdivision, but it does not have at least 120 feet of shoreline frontage. Because of its size, this lot is still eligible for subdivision, but any new lots will be located upland of the shoreline, and no new shoreline frontages would be created. Subdivision of this parcel is assumed to create only 1 additional lot within the shoreline jurisdiction and no additional shoreline frontages¹.

In summary, subdivision of vacant parcels in Segment A is anticipated to result in a total of 7 developable lots within the shoreline jurisdiction, of which 6 lots would have shoreline frontage.

Developed Parcels

The 104 developed parcels fall into a number of categories, based on site conditions:

- 22 parcels do not meet the minimum frontage standard of 60 feet to be eligible for subdivision. Future development of these lots is limited to redevelopment of existing structures, as described in the previous section, Redevelopment of Existing Properties.
- 9 lots have sufficient size and frontage to be subdivided, but the location and configuration of existing structures, as well as lot dimensions, would make subdivision difficult. No new shoreline lots are anticipated to be created from these properties.
- 56 lots have at least 60 feet, but less than 120 feet, of shoreline frontage. These lots do not have sufficient lake frontage to be divided into multiple lakefront lots, but they could be subdivided into lots oriented perpendicular to the shoreline. As described in the discussion of subdivision of vacant lots, each of these properties is assumed to be able to create 1 additional lot within the shoreline jurisdiction, resulting in 56 new upland lots. No new shoreline frontages would be created from these lots.
- The remaining 18 lots have few impediments to subdivision. Each lot has at least 120 feet of shoreline frontage and is assumed to subdivide in a manner that would create new shoreline frontage lots. Assuming new lots would have a shoreline frontage of approximately 60 feet, and considering factors such as site access, lot shape, and location of existing structures, subdivision is estimated to result in a total of ~~43-39~~ shoreline frontages, including parent parcels, or 21 new shoreline frontage lots. Some of the larger parcels Notably, new shoreline frontages would be restricted for shoreline subdivisions that created more than two new lots or long subdivisions. This provision would impact the such as the Sunset RV Resort, have sufficient square footage that upland parcels without shoreline frontage could be created in addition to the new lakefront lots. However, minimum lot depth requirements for the shoreline parcels would ensure that these upland parcels would be located mostly or entirely outside the shoreline

¹ Shoreline parcels that do not meet the minimum shoreline frontage necessary for creation of new shoreline lots can still be subdivided to create "stacked" lots oriented perpendicular to the shoreline. Depending on the depth of the parent lot, this method of subdivision can create a large number of new lots. However, relatively few of them would be located within the 200-foot shoreline management area. Because the R4 zone requires a minimum lot size of 9,600 square feet, the minimum depth for a lot 60 feet wide would be 160 feet. Even lots just below the minimum subdivision threshold of 120 feet would still be a minimum of 80 feet deep. Based on these dimensional requirements, any lot not wide enough to create new shoreline frontages can only create, at most, 1 additional upland lot that lies entirely within the shoreline jurisdiction.

[jurisdiction where it is expected that areas along the shoreline would be contained within a common open space tract.](#)

In summary, subdivision of developed properties in Segment A has the potential to create approximately **25-21 new** shoreline frontage lots and **56-60 new upland lots** within the shoreline jurisdiction.

Shoreline Armoring

As described in Chapter 2, approximately 80% of the shoreline in Segment A is currently armored. Additional shoreline stabilization and armoring could result from future residential development in the area, though this is anticipated to be limited. As described in the previous sections, Segment A contains only 9 vacant parcels with shoreline frontage, and most of the developed parcels that are eligible for subdivision are already armored; only approximately 20 of these parcels do not currently have some form of shoreline armoring in place. Additionally, the SMP strictly limits new structural shoreline stabilization measures, as well as repair and replacement of existing structures. Bio-engineered methods are preferred, and structural solutions are only allowed where it can be demonstrated that they are necessary to protect existing development. Shoreline stabilization associated with future development will therefore result in fewer impacts on shoreline function. As existing bulkheads deteriorate and major repairs or replacement are proposed, the proposed standards are expected to result in a net improvement in ecological functions as some existing hard armoring is converted to non-structural or soft armoring improvements. In addition, the proposed SMP includes incentives to reduce minimum shoreline setbacks in exchange for restoration activities or implementation of soft armoring and LID techniques. As described in Chapter 2, these incentives are expected to prompt some currently armored properties to convert to non-structural techniques in order to reduce the shoreline setback required on their property as they redevelop.

Overwater Structures

Development of new residences on vacant and subdividable parcels is likely to result in an increase in the number of overwater structures on Lake Sawyer, further increasing modification of the shoreline and disruption of ecological processes.

The SMP limits the construction of new piers and docks to those providing public access or associated with a water dependent use, including a single-family residential structure. Joint-use piers are required for lots without at least 60 feet of shoreline frontage, as well as any development that creates more than two new dwelling units. As described in Chapter 2, approximately 34 existing lots in Segment A do not have access to a dock or pier. Construction of new docks on Lake Sawyer is anticipated to occur as follows:

- Of the 34 parcels currently without a dock or pier, three are subdividable, and each is anticipated to create two shoreline lots, thus producing ~~a~~ 6 new piers [if each lot developed a single use pier. For the purposes of this analysis we assume one subdivision would construct a joint use pier and one subdivision would construct individual piers for each new lot, for a total of 4 new piers.](#)
- Of the 34 parcels currently without a dock or pier, one has sufficient shoreline frontage to be subdivided into 3 parcels. SMP regulations for overwater structures require joint use

docks for development of more than two dwellings (SMP 5.F.2.b.6). This parcel is therefore anticipated to create 1 new joint use pier.

- Each of the remaining 30 existing parcels without a dock or pier ~~is anticipated to~~ could develop a single-use pier under the provisions of the SMP, resulting in 30 new piers. Several of the parcels currently without dock access have shoreline frontage of less than 60 feet; such properties are required to establish joint-use docks wherever feasible. For the purposes of this analysis we assumed that approximately 10% of new piers would be joint use piers, serving 2 lots each. This would result in approximately 3 new joint use piers and 24 single use piers, for a total of 27.
- Accounting for vacant and subdividable parcels included thus far, an additional ~~46-12~~ new shoreline frontage lots could be created in Segment A through subdivision. Each new parcel ~~is anticipated to~~ could develop a single-use pier. For the purposes of this analysis we assumed that 10% of the piers would be joint use piers, serving 2 lots each. This would result in approximately 1 new joint use piers and 10 single use piers, for a total of 11.

In total, approximately ~~50-5543~~ new docks or piers could be created in Segment A, 6 of which would be joint use, though this estimate is probably higher than what is likely to occur. ~~Several of the parcels currently without dock access have shoreline frontage of less than 60 feet; such properties are required to establish joint use docks wherever feasible. Based on the number of these parcels that are not currently served by docks, as well as the number of subdividable parcels that could create 3 frontages or more, it is estimated that approximately 15% of future overwater structures on Lake Sawyer will be joint use, while the remaining 85% will be single use.~~

According to the SMP's dimensional standards for overwater structures, joint-use piers have a maximum surface area of ~~700-600~~ square feet, and single-use piers have a maximum surface area of ~~600-480~~ square feet. Based on the anticipated proportions of single-use and joint-use structures, and any additional floats (which are counted towards the maximum coverage previously identified) new overwater coverage is anticipated to be approximately ~~21,360~~ 33,825 square feet. This represents a ~~2214~~ 2214% increase over existing conditions. New overwater structures, ~~however,~~ would also be required to comply with the SMP's standards for dock and pier materials, which require materials that allow ~~4060~~ 4060% light to penetrate to the water below, thereby reducing effective overwater coverage.

Over time, the new standards would reduce overwater coverage from older docks and piers as they are replaced. It is estimated that a considerable percentage, perhaps 20% to 40%, of existing docks will undergo major repairs or replacement during the planning period of the SMP with more fish-friendly materials and design features required under the SMP. Over time, the majority of existing docks would be constructed to the new standards. These include:

- Fixed pile piers shall maintain at least 2 feet of vertical clearance above the OHWM
- Floating docks are discouraged unless floating elements are not located within the first 30 feet from the shoreline.
- Dock width would be limited to 4 feet within the first 30 feet from the shoreline.

- Wooden components that come in contact with the water shall not be treated with toxic substances that can result in water contamination.

Replacement of older docks designed to these new standards will result in further reduction in effective overwater coverage, shading and other impacts on salmonids associated with overwater structures.

4.3.2 Segment B – Lake Sawyer Park Boat Launch

Anticipated Changes in Land Use

The Lake Sawyer Park Boat Launch is unlikely to see significant land use changes, given the size and location of the property. The site is anticipated to remain in City ownership and continue in its use as a park and public access point for the lake.

Likely Development and Implications for Shoreline Management

The Lake Sawyer Boat Launch Park is expected to remain in City ownership and not be subdivided for additional development. The City's Comprehensive Parks Plan has identified the site for additional improvements to site facilities, including increased parking, bathroom facilities, a new boat launch and access dock, and restoration of shoreline vegetation. [As of Summer 2012, the boat launch had been improved, but the other improvements had not been implemented.](#) These improvements have the potential to clear additional vegetation and increase the level of impervious surface, which would further degrade function of the shoreline.

However, as required by the proposed SMP, the City's development plans for the boat launch improvements will address on-site drainage issues, include water quality control facilities, and include appropriate mitigation to ensure no net loss of ecological function. As a public access point, the new access dock would be limited in size at 1,000 square feet and the boat ramp is expected to occupy an area similar to the current facility. While construction of the access dock would increase overwater coverage in this segment by up to 1,000 square feet, the pier would be required to use materials that allow ~~40~~60% light penetration through the decking and maintain vertical clearance above the water surface, thereby reducing impacts from overwater shading. Specific standards in the SMP would mitigate impacts associated with the boat ramp as well.

4.3.3 Segment C – Forested Single Family Parcel

Anticipated Changes in Land Use

This segment consists of a single, 12.9-acre parcel currently used as a single family dwelling, with 7.7 acres within the shoreline jurisdiction. Residential use is expected to continue on this property. The property is not expected to redevelop in the near future, based on the owner's desire to maintain the current use and its current taxation status as open space. Should the site be sold in the future, it may be subdivided for single-family residential use, provided that sanitary sewer service is extended to the site.

Likely Development and Implications for Shoreline Management

Potential New Lots from Subdivision

While the proposed SMP restricts the subdivision of land in areas not adequately served by sanitary sewer, and this parcel is unlikely to convert from its current use to single-family residences in the foreseeable future, the site could ~~be potentially~~[theoretically be](#) subdivided to create up to 25 lots with shoreline frontage, based on a minimum lot width of 60 feet and minimum lot size of 9,600 square feet, as set forth in BDMC 18.30.040.A. ~~The remaining upland acreage of the property could be further subdivided to create 33 lots. However, under~~

~~these minimum dimensional requirements, shoreline frontage lots with the minimum width of 60 feet would need a lot depth of at least 160 feet to meet the minimum lot size. As a result, any additional upland lots created on the site would have only a small portion of their area within the shoreline jurisdiction. Therefore, we estimate that the future subdivision of this property will result in no more than a total of 25 lots within the shoreline jurisdiction, all with shoreline frontage. However, based on this cumulative impacts analysis and Department of Ecology comments on the draft SMP standards, the City is proposing additional subdivision standards (see Chapter 4, Section C.8.c.3. These standards would apply to residential short subdivisions that create more than two lots and all long subdivisions. These standards are in addition to those required under Title 17 and other sections of the Black Diamond Municipal Code. Standards would include:~~

- ~~a. New primary residential structures shall not be located within 100 feet of the Ordinary High Water Mark.~~
- ~~b. Lot divisions subject to these provisions shall be designed to include a common open space tract encompassing all areas within 75 feet of the ordinary high water mark that are not directly associated with the developed yard area of any retained primary structure on the parent lot.~~
- ~~c. Public access may be required for subdivisions of more than four lots pursuant to the requirements of Chapter 3, Section B.5.c.~~
- ~~d. Vegetation removal within the required open space tract shall be the minimum necessary to facilitate water-oriented recreational uses. Structures within 50 feet of the ordinary high water mark shall be limited to overwater structures (e.g. joint use pier) and related access, such as a trail and stairs.~~
- ~~e. Pruning consistent with accepted aboricultural practices shall be allowed within the open space tract to provide views of the water from and through the tract, but healthy native vegetation shall be retained consistent with Subsection d above.~~
- ~~f. New lots created through the subdivision shall be required to connect to the public sanitary sewer.~~

~~Based on the proposed subdivision standards, However, considering the SMP's requirements for no net loss of ecological function, preservation of native vegetation and mitigation for any removals, and public access, the actual number of lots within shoreline jurisdiction that could be created by subdivision under the proposed SMP is likely to be substantially lower, approximately 22, and that no new private shoreline frontages would be created. The remaining upland acreage of the property could be further subdivided. However, under proposed minimum dimensional requirements, lots with the minimum width of 60 feet would need a lot depth of at least 160 feet to meet the minimum lot size. As a result, any additional upland lots created on the site would likely not be within the shoreline jurisdiction. Given the proposed vegetation conservation standards, the actual number of We expect that only a few new lots could actually that would be created within shoreline jurisdiction could be further reduced to comply with no net loss standards, if the requirements of the proposed SMP were adopted. While it is possible that the applicant might limit subdivision initially to allow creation of up to three building sites with shoreline frontage (i.e. 2 new lots), we feel it is more likely that the property would be developed under a long subdivision for maximum yield. Much more likely would be the creation of a~~

~~significant number of upland lots and a~~ common recreational tract encompassing a large portion of the current shoreline would occupy the first 75 feet from the OHWM, with new residential structures located at least 100 feet from the OHWM. The only lot with true shoreline frontage would be the “parent lot” with the existing home, developed yard area and dock.

Development of property for single-family residential use could potentially degrade shoreline functions as a result of increased impervious surface coverage and upland vegetation clearing. However, the proposed SMP restricts impervious surface coverage in the Shoreline Residential environment to 40% of lot area, which will limit the impacts associated with redevelopment and expansion. The proposed SMP also requires use of LID techniques to the greatest extent feasible, requires mitigation for impacts associated with shoreline development, and requires minimization of vegetation clearing, preservation of native vegetation areas and mitigation (SMP 3.B.7).

Vegetation Clearing

The property is currently heavily forested, and subdivision and redevelopment would entail extensive vegetation clearing, which would reduce the site’s ability to filter pollutants from run-off to the lake. Additionally, removal of shoreline vegetation during installation of armoring or overwater structures would reduce the wave energy attenuation function of this Segment.

However, under the proposed subdivision standards, areas within 75 feet of the OHWM would be included in a common open space tract that would only allow very limited vegetation removal necessary to facilitate water-oriented recreation uses, such as trails and stairs. New development would ~~also, however,~~ be subject to the vegetation preservation standards of the SMP (SMP3.B.7), which require the preservation and restoration of cleared native vegetation, retention of native understory within shoreline setback areas, limits on tree removal, and implementation of replanting and mitigation programs to preserve the ability of water to infiltrate on the site and achieve no net loss.

Shoreline Armoring

As described in Chapter 2, the property is, for the most part, free of armoring and shoreline modifications; Segment C represents some of the most natural shoreline areas on Lake Sawyer. Though redevelopment of this Segment is not anticipated for the near future, subdivision of the property to provide additional shoreline residential lots could result in increased modification of the shoreline. However, the SMP strictly limits new structural shoreline stabilization measures, as well as repair and replacement of existing structures. Bio-engineered methods are preferred, and structural solutions are only allowed where it can be demonstrated that they are necessary to protect existing development. As the site currently contains very little development, it is unlikely that much structural stabilization would be allowed in the future. Most, if not all, All new lots on the site would be required by the SMP to be designed to minimize the need for shoreline stabilization and to use non-structural methods when stabilization is necessary.

Overwater Structures

The SMP requires that joint-use docks or piers be provided for any shoreline development of more than two residences, as opposed to single-use structures. As described under Potential New Lots from Subdivision, future development of the site would create up to ~~25-22~~ new shoreline frontage lotslots, however none of them are expected to have shoreline frontage. Any future

development of this site would therefore be required by SMP 5.F.2.b.6 to provide a single, joint-use or community moorage structure. Per the dimensional standards of the SMP, this structure could be up to 1,000 square feet in size, assuming it is intended for access by the public at large. While construction of this dock would result in an increase of overwater coverage of 1,000 square feet, SMP regulations also require that the decking material allow for penetration of 40-60% light to the water below, which would reduce impacts from overwater shading.

4.3.4 Segment D – Islands

Anticipated Changes in Land Use

Significant new development on the islands is unlikely due to the lack of adequate utilities, making it difficult for applicants to meet the necessary permit requirements for new development. Land uses in this segment are anticipated to remain stable.

Likely Development and Implications for Shoreline Management

Development of Vacant Lots

As described in Chapter 2, three of the four islands are currently vacant. However, development of these properties is unlikely, as no utilities are available, making it difficult for new construction to meet City permit requirements. Additional construction of accessory structures could occur on the northwest island, which is already developed with several residences, but no new primary uses are likely to be permitted in the foreseeable future. Review of aerial photos indicates that undocumented structures may be located on at least one of the undeveloped islands, and additional enforcement efforts may be required by the City to prevent unpermitted development on these islands that could degrade shoreline function.

Shoreline Armoring

While new development on the islands is unlikely to occur, some of the existing structures on the northwest island are currently protected by shoreline armoring. Eventually, this armoring will require repair or replacement, and property owners will be required to convert any hard armoring, such as bulkheads and riprap, to non-structural solutions unless they can demonstrate that such measures would be unable to adequately protect existing development. Over time, therefore, the proposed SMP regulations, if implemented, would improve the condition of the island shorelines.

Overwater Structures

Every existing residence on the islands currently has access to a dock or pier, and the northeastern island, which is currently undeveloped, features two docks. Because no additional residential development is anticipated to occur on any of the islands, no additional docks or piers would be constructed. Over time, as the eight existing docks age, property owners who wish to repair or replace them will be required to convert their structures to be in compliance with the SMP regulations for overwater structures, including the requirement for 40-60% light penetration through the decking material. Over time, the proposed regulations will result in a net reduction in effective overwater coverage. During the planning period of the SMP, it is assumed some of the existing docks would be repaired or replaced with more fish-friendly materials and design features required under the SMP. These include:

- Fixed pile piers shall maintain at least 2 feet of vertical clearance above the OHWM

- Floating docks are discouraged unless floating elements are not located within the first 30 feet from the shoreline.
- Wooden components that come in contact with the water shall not be treated with toxic substances that can result in water contamination.

Replacement of older docks using these techniques will result in further reduction in effective overwater coverage and shading impacts on fish.

4.3.5 Segment E – Lake Sawyer Regional Park and Adjacent Residential

Anticipated Changes in Land Use

The Regional Park is anticipated to continue as a recreational area for the foreseeable future, and the City plans to further develop the site to provide greater public shoreline access. The residential parcel north of the park, which large enough for subdivision, is anticipated to remain vacant for the foreseeable future until sanitary sewer service is provided to the area. At such time, the parcel may convert to residential use. Although there are no current plans to do so, there is also the potential that this property could be converted to public recreational use as it is adjacent to the current Regional Park.

Likely Development and Implications for Shoreline Management

Residential Development of Vacant Property

While no subdivision or development of non-recreational uses is anticipated at the regional park, Segment E also contains a privately owned property immediately north of the park that is designated as Shoreline Residential. This property has approximately 1,363 feet of shoreline frontage and, under the minimum lot dimension requirements of the proposed SMP and BDMC 18.30.040, could be subdivided to create up to 22 shoreline frontages. [However, based on the analysis contained in the preliminary cumulative impacts analysis and Department of Ecology comments on the draft SMP standards, the City is proposing additional subdivision standards \(see Chapter 4, Section C.8.c.3. These standards would apply to residential short subdivisions that create more than two lots and all long subdivisions. These standards are in addition to those required under Title 17 and other sections of the Black Diamond Municipal Code. We expect that as a result of these standards no new shoreline frontage would be created and all areas within 75 feet of the OHWM would be included in a common open space tract that serves upland lots. It should be noted that the majority of lot area within shoreline jurisdiction is mapped as wetland, which would further reduce development potential. We expect that given wetland and wetland buffer development restrictions proposed in the Draft SMP, no more than 3 new lots would be created within shoreline jurisdiction on this parcel.](#)

~~The remaining upland acreage could be further divided to create 15 lots without shoreline frontage, though most of these upland lots would lie outside the shoreline jurisdiction.~~ [However, in addition,](#) it should be noted that subdivision in areas where sanitary sewer is not available is restricted by both proposed and existing shoreline regulations, which could delay or preclude construction of these units. Furthermore, [based on the vegetation management and wetland standards in the SMP, and](#) considering the SMP's requirements for no net loss of ecological function, and public access, the actual number of lots that could be created by subdivision under the proposed SMP ~~is likely to~~[could](#) be substantially lower. ~~We expect that~~

~~only a few new lots could actually be created within shoreline jurisdiction if the requirements of the proposed SMP were adopted. Much more likely would be the creation of a number of upland lots and a common recreational tract encompassing a large portion of the current shoreline.~~

Recreational Development

The majority of Segment E consists of the Lake Sawyer Regional Park, which is owned by the City and is anticipated to experience limited development for recreational purposes. While development plans for the regional park are not finalized, the 2008 Lake Sawyer Park Development Concept Plan indicates that future development for those portions of the park within the shoreline jurisdiction will consist primarily of passive recreational facilities such as trails, picnic areas, and open space. A swimming area, kayak and canoe launch, and fishing point are also tentatively planned, as well as a restoration and monitoring project at the mouth of Ravensdale Creek. Development of ball fields and parking areas may also occur, but these facilities would be located outside the shoreline jurisdiction.

Development at the park provides an excellent opportunity for shoreline enhancement through the protection of sensitive vegetation, soils, and wildlife habitat.

Shoreline Armoring

As described in Chapter 2, approximately 50% of the shoreline in this segment has been armored, most extensively along the park shoreline in the southwest. Subdivision and residential development of the property north of the park could ~~create up to 22 new shoreline frontages and~~ potentially increase the level of shoreline modification in portions of this segment. The SMP strictly limits new structural shoreline stabilization measures, as well as repair and replacement of existing structures. Bio-engineered methods are preferred, and structural solutions are only allowed where it can be demonstrated that they are necessary to protect existing development. As the residential property is currently vacant, no additional structural stabilization measures would be allowed. Proposed subdivision standards would require areas within 75 feet of the OHWM to be included in a common open space tract, with all structures at least 50 feet from the OHWM. This is expected to eliminate the potential for shoreline armoring in this reach. The existing armoring would also be replaced, either as it aged or at the time of residential development, with new, non-structural stabilization systems, as required by the SMP.

Recreational development at the park is not expected to result in additional shoreline armoring. Over time, further development of the park would result in the removal of existing stabilization structures as part of shoreline restoration efforts or the replacement of current structures with non-structural systems where required. Large portions of the park shoreline are currently stabilized with timber bulkheads, which the City has informally indicated that it intends to remove. The City also intends to implement extensive shoreline planting in the area to stabilize the lakeshore and enhance shoreline functions. The removal of shoreline armoring and implementation of shoreline planting at the park provide great opportunities for restoration and enhancement of shoreline function in this area, and both will be addressed in the Restoration Plan component of the SMP.

Overwater Structures

The SMP requires that joint-use docks or piers be provided for any shoreline development of more than two residences, as opposed to single-use structures. As described under Residential Development of Vacant Property, future development of the site would create up to ~~22-3~~ new ~~shoreline frontage~~ lots ~~in shoreline~~ jurisdiction; ~~however none of these lots are expected to have shoreline frontages because of the requirements of the residential subdivision regulations in the Draft SMP~~. Any future development of this site would ~~therefore also~~ be required by SMP 5.F.2.b.6 to provide a single, joint-use or community moorage structure. Per the dimensional standards of the SMP, this structure could be up to 1,000 square feet in size, assuming it is intended for access by the public at large. While construction of this dock would result in an increase of overwater coverage of 1,000 square feet, SMP regulations also require that the decking material allow for penetration of ~~40~~60% light to the water below, which would reduce impacts from overwater shading. The SMP also requires overwater structures to maintain a minimum vertical clearance above the water surface, avoid placing pilings in the nearshore, and avoid use of floating components to minimize shading impacts on fish.

Construction of new overwater structures are the regional park could occur in a limited manner to provide a fishing area and public access to the water, as described in the 2008 Lake Sawyer Park Development Concept Plan. While construction plans are not complete, we estimate that development of the park will entail construction of a single, public access pier, which is limited by the SMP to 1,000 square feet in size. While construction of this dock would result in an increase of overwater coverage of 1,000 square feet, SMP regulations also require that the decking material allow for penetration of ~~40~~60% light to the water below, which would reduce impacts from overwater shading. The SMP also requires overwater structures to maintain a minimum vertical clearance above the water surface, avoid placing pilings in the nearshore, and avoid use of floating components to minimize shading impacts on fish.

4.3.6 Segment F – Lake Sawyer Regional Park Wetland

Anticipated Changes in Land Use

Due to restrictions on development near wetlands imposed by the City's critical areas ordinance and included in the proposed SMP, significant development in this segment is unlikely. The area is anticipated to remain in passive recreational use as part of the Lake Sawyer Regional Park.

Likely Development and Implications for Shoreline Management

The SMP designates Segment F as Natural, which would prohibit further subdivision of property in order to protect valuable natural resources in the area. The Lake Sawyer Park Development Concept Plan designates this area for passive recreational activities, such as hiking trails, and for habitat restoration activities. No shoreline armoring or overwater structures would be constructed, and the passive use of the area would limit vegetation clearing and keep impervious surface coverage low, maintaining the currently high ecological function of the segment.

4.3.7 Summary of Potential Future Development

Table 4 summarizes the potential for new development within each analysis segment and for the shoreline management area as a whole.

Table 4. Summary of Potential Development by Inventory Segment

Inventory Segment	Development of Existing Vacant Lots	Potential New Lots from Subdivision	New Shoreline Frontages	New Overwater Structures
Segment A (Residential)	<ul style="list-style-type: none"> 8 new residences on existing lots that are too small for subdivision 	<ul style="list-style-type: none"> 3 vacant lots subdivided to create 4 new lots within the SMA (7 total). 74 developed lots potentially subdivided to create 81 new lots within the SMA. 	<ul style="list-style-type: none"> 4 new shoreline frontages from subdivision of vacant parcels (6 total lots with shoreline frontage, if counting vacant parent lot). 25-21 new shoreline frontages from subdivision of developed parcels. 	<ul style="list-style-type: none"> Approximately 50-5543 new overwater structures associated with residential development. Increased effective overwater coverage of 21,360-33,825 square feet. Some existing docks would be repaired or replaced using proposed SMP standards, thereby reducing impacts from overwater shading.
Segment B (Lake Sawyer Park Boat Launch)	None. Additional development expected with boat ramp improvements.	None	None	<ul style="list-style-type: none"> New access dock would increase effective overwater coverage by 1,000 square feet.
Segment C (Forested Single Family Parcel)	None	<ul style="list-style-type: none"> Subdivision could create up to 25-22 lots within the SMA, however, far fewer are expected due to other standards in the SMA intended to implement “no net loss”. 	<ul style="list-style-type: none"> Up to 25 new shoreline frontages from subdivision, however far fewerNew new shoreline frontage lots are expected as a result of proposed special subdivision regulations. 	<ul style="list-style-type: none"> If subdivided, site would require a single community dock to serve residences. New dock would increase effective overwater coverage by up to 1,000 square feet.
Segment D (Islands)	None	None	None	<ul style="list-style-type: none"> Some existing docks would be repaired or replaced using proposed SMP standards, thereby reducing impacts from overwater shading.
Segment E (Lake Sawyer Regional Park and Private Property North of the Park)	None. Additional park facilities expected to be developed.	<ul style="list-style-type: none"> Subdivision of residential property north of Park to create up to 22 new lots within SMA however, far fewer are expected due to other standards in the SMA 	<ul style="list-style-type: none"> 22 new shoreline frontages from subdivision of vacant residential parcel, however, far fewer are expected due to other standards in the SMA intended to implement “no net loss”No 	<ul style="list-style-type: none"> If subdivided, site would require a single community dock to serve residences. New dock would increase effective overwater coverage by up to

Inventory Segment	Development of Existing Vacant Lots	Potential New Lots from Subdivision	New Shoreline Frontages	New Overwater Structures
		<p><u>intended to implement “no net loss” expected to only create 3 new lots in shoreline jurisdiction because of wetland protection standards and required buffers”.</u></p>	<p><u>new shoreline frontages are expected due to special subdivision regulations.</u></p>	<p>1,000 square feet.</p> <ul style="list-style-type: none"> • New fishing dock at regional park would increase effective overwater coverage by up to 1,000 square feet.
Segment F (Lake Sawyer Regional Park Wetland)	None	None	None	None
Total for Shoreline Management Area	8 new residences on vacant lots. Please note that redevelopment and expansion of existing single family residences on currently developed lots is expected to be the most common development activity in the SMA.	<ul style="list-style-type: none"> • Up to 132 110 new lots within the SMA, however, far fewer are expected due to other standards in the SMA intended to implement “no net loss” and public access requirements. 	<ul style="list-style-type: none"> • Up to 76 25 new shoreline frontages however, far fewer are expected due to other standards in the SMA intended to implement “no net loss” and public access requirements. 	<ul style="list-style-type: none"> • 50 60 47 new overwater structures. • Net increase in overwater coverage of 37,825 25,360 square feet. • Some conversion of existing docks and piers (perhaps up to 40% in 10 years) to proposed size and materials standards as they age and need repair or replacement.

5.0 SMP PROVISIONS AND IMPACT ASSESSMENT

5.1 GENERAL GOALS, POLICIES, AND REGULATIONS

The proposed SMP contains numerous goals, policies, and regulations intended to protect shoreline areas and achieve no net loss of ecological function. Some of the most relevant policies and regulations are summarized below.

- Critical areas within the shoreline jurisdiction shall be regulated by the provisions of the City's Environmentally Sensitive Areas Ordinance, which is incorporated into the proposed SMP (Chapter 3.3).
- Protect shoreline process and ecological functions through regulatory and non-regulatory means that may include acquisition of key properties, conservation easements, regulation of development within the shoreline jurisdiction and incentives to encourage ecologically sound design (SMP 3.4.b.1).
- All shoreline uses and developments shall be located, designed, constructed and mitigated to result in no net loss of ecological functions necessary to sustain shoreline natural processes (SMP 3.4.c.1)
- All shoreline uses and activities shall utilize best management practices (BMPs) to minimize any increase in surface runoff and to control, treat and release surface water runoff so that receiving water quality and shore properties and features are not adversely affected. BMPs are identified in the City's adopted stormwater manual (SMP 3.4.c.5).
- All shoreline uses and activities shall be located and designed to prevent or minimize the need for shoreline protection structures (bulkheading, riprap, etc.) and stabilization, landfills, groins, jetties, or substantial site regrades (SMP 3.4.c.8).
- Promote restoration of biologically degraded areas and increase quality of native vegetation in habitat corridors (SMP 3.6.b.1 and 3.6.b.2).
- Target the Lake Sawyer Boat Launch and Lake Sawyer Regional Park for restoration of shoreline natural resources and functions while ensuring continued public access to the shoreline (SMP 3.6.c.1).
- Encourage bulkhead removal and vegetation conservation on single-family lots through use of incentives, such as setback reductions (SMP 3.6.c.2, 3.6.c.5, and 3.6.c.8).
- Shoreline development should be located and designed to mitigate adverse impacts to water quality (SMP 3.8.b.1).
- New residential development and property owners with failing septic systems that pose a risk to health or the environment shall be required to connect to public sewer if they are seeking a shoreline, building, or site development permit and such connection can be made within 300 feet of the property. (SMP 3.8.c.4).

5.2 GENERAL CUMULATIVE IMPACTS ASSESSMENT

The following section summarizes potentially impacted processes, relevant SMP policies and other regulatory provisions, and anticipated net effect on shoreline function for each shoreline inventory segment. A discussion of the effects of shoreline development on each type of ecological function is provided in Section 4.2.

5.2.1 Segment A – Residential

Anticipated Future Development

As described in Section 4.3, residences are likely to expand or redevelop to larger homes. As described in Table 4, Segment A currently contains 11 vacant lots, which are expected to eventually develop with single-family residences. Additional residential lots could be created through subdivision, though this is dependent on provision of sanitary sewer service and is not anticipated to occur in the near future. A complete discussion of the potential for subdivision and redevelopment is contained in Section 4.3.

Resources at Risk

Upland Development Activities

Upland development in Segment A is anticipated to consist of new and expanded residential development, leading to increased impervious surface area and clearing of vegetation above the OHWM. These development activities have the potential to negatively impact hydrologic, vegetation, and habitat resources, as described in Section 4.2. Specifically, upland development activities would impact the following ecological processes and functions:

- Water and sediment storage;
- Removal of excess nutrients and toxic compounds;
- Recruitment of large woody debris and organic material;
- Improvement of water quality;
- Sediment removal and bank stabilization
- Physical habitat space and conditions for life history; and
- Wildlife food production and delivery.

Nearshore Development Activities

Near-shore development in Segment A is anticipated to consist of shoreline modification and stabilizations measures associated with upland residential development. These modifications may include installation or expansion of bulkheads or other shoreline stabilization structures that could adversely affect hydrologic, vegetation, hyporheic, and habitat resources, as described in Section 4.2. Specifically, nearshore development activities would impact the following ecological processes and functions:

- Attenuation of wave energy;
- Recruitment of large woody debris and organic material;
- Sediment removal and bank stabilization

- Removal of excess nutrients and toxic compounds;
- Water storage;
- Vegetation support;
- Maintenance of base flows; and
- Physical habitat space and conditions for life history.

Overwater Development Activities

As described in Section 4.3, overwater development in Segment A is anticipated to consist of up to approximately ~~50-55~~43 new docks or piers, as well as the gradual replacement and repair of existing overwater structures. As summarized in Table 4, overwater development in Segment A is anticipated to result in a net increase in effective overwater coverage of up to approximately ~~33,825~~21,360 square feet. The presence of overwater structures can adversely affect hydrologic and aquatic habitat resources and would specifically impact the following ecological processes and functions:

- Attenuation of wave energy;
- Removal of excess nutrients and toxic compounds;
- Physical habitat space and conditions for life history; and
- Wildlife food production and delivery.

Effect of Proposed SMP Regulations

Upland Development Activities:

New upland development in the Shoreline Residential environment would be subject to a maximum of 40% impervious site cover, and a maximum building footprint of 30% of site area. (SMP 4.B.2)

All development in the Shoreline Residential environment would be subject to a standard 40-foot setback from the OHWM. This setback can be reduced to a minimum of ~~20-25~~ feet when approved mitigation or restoration actions are taken, such as bulkhead removal, vegetation preservation, use of LID techniques, or keeping impervious surface significantly below allowances. (SMP 4.B.3 and 4.B.4) Implementation of these techniques will minimize impacts on ecological functions by limiting impervious surface and reducing stormwater runoff to the lake that could contain excess nutrients and toxic materials, as well as increasing the potential for natural filtration by preserving natural vegetation. In addition, SMP regulations would require that all stormwater runoff be appropriately treated and directly discharged to the lake (SMP 4.C.8.c):

“Stormwater runoff for all new or expanded pavements or other impervious surfaces shall be directed to infiltration systems and other Low Impact Development techniques shall be incorporated into new development as feasible, in accordance with the City’s adopted Surface Water Design Manual and the Low Impact Development Technical Guidance Manual for Puget Sound.”

The SMP would also reduce upland impacts on water quality through regulations requiring new development to connect to public sanitary sewer, thereby reducing pollutant loading from failing septic systems. Use-specific regulations for residential development (SMP 4.C.8.c) state:

- “Residential development shall be required to connect to public sewer if the property owner is seeking building or site development permit or the property has a failing septic system that poses a risk to health or the environment, and such connection can be made within 300 feet of the subject property.”
- “New lots created through subdivision shall be required to connect to the public sanitary sewer.”

Upland development impacts on vegetation and habitat functions would also be reduced by application of the SMP’s vegetation conservation regulations (SMP 3.B.7.c), which require that clearing of shoreline vegetation be kept to the minimum amount necessary for development. Additionally, any development that entails tree removal and land clearing shall require a report from a qualified professional identifying appropriate mitigation measures to assure no net loss of ecological function.

Near-shore Development Activities:

Impacts on ecological functions in the near-shore area would primarily result from the presence of shoreline stabilization structures, such as bulkheads. The SMP places strict limits on new structural stabilization measures, as well as the repair or replacement of existing structures. Bio-engineered shoreline protection measures are the preferred means of erosion prevention, and structural solutions shall only be allowed where it can be demonstrated that such methods are necessary to protect existing development and that non-structural stabilization solutions are infeasible or would not provide adequate protection (SMP 5.2.b.1). Likewise, new bulkheads on developed lots shall only be allowed to protect an existing structure. The applicant must demonstrate a need for the bulkhead in the form a geotechnical report that confirms the existing structure will be damaged within 3 years due to shoreline erosion, and must also show that non-structural stabilization measures are infeasible or would not provide adequate protection to prevent damage to the property.

New development, including land subdivision, would be required to be located and designed to minimize the need for shoreline stabilization, and new non-water dependent uses shall be prohibited from constructing stabilization that would cause significant impacts (SMP 5.2.b.2).

Additional regulations on shoreline stabilization structures (SMP 5.2.b) require that existing stabilization structures shall not be replaced with similar structures unless it can be demonstrated that non-structural methods are inadequate to protect existing development from ongoing erosion caused by currents or waves. As existing stabilization structures fail over time, this requirement will result in the conversion of many properties that currently use structural protection methods to non-structural protection, reducing impacts on near-shore ecological functions and improving shoreline conditions.

Overwater Development Activities:

Piers, docks, and floating platforms are permitted uses in the Shoreline Residential environment when accessory to residential development. Impacts on ecological functions would be limited by

application of the SMP's overwater structure regulations (SMP 5.F.2.b). These regulations require that any components of overwater structures that contact the water shall be free of toxic substances that may contaminate the lake, thus protecting water quality. All new docks and piers must also incorporate materials that allow light penetration to the water below, thus reducing impacts on growth and behavior of aquatic organisms.

Effect of Other Regulatory Requirements and Restoration Activities

In addition to the provisions of the SMP, the City's Sensitive Areas Ordinance (BDMC 19.10), which has been incorporated into the SMP, governs development that may have adverse impacts on environmentally sensitive areas, such as wetlands, fish and wildlife conservation areas, geologically hazardous areas, critical aquifer recharge areas, and frequently flooded areas. BDMC 19.10 requires the implementation of measures to limit alteration of sensitive areas and ensure no net loss of ecological function.

In addition to City review, any development activities taking place in or over water, including wetlands, would require review by the Washington State Department of Fish and Wildlife, the U.S. Army Corps of Engineers, and the Washington State Department of Ecology. Each of these agencies has the authority to review proposals for in-water work and apply conditions and mitigation measures before granting permits.

Net Effect on Ecological Performance

While the shoreline environment in Segment A is extensively built out, potential exists for additional development through redevelopment, subdivision and development of vacant lots (listed in order of magnitude). Development of the 11 existing vacant lots, as well as new lots from subdivision, including associated construction of new overwater structures and shoreline armoring, has the potential to further degrade ecological function. As described in Chapter 2, impervious cover in Segment A is estimated at approximately 25-30%, and construction of new residences and expansion of existing homes could potentially increase this coverage up to the maximum allowed. However, as described in Chapter 2, the median setback distance for primary structures in Segment A is 48.7 feet, and approximately 112 structures are within the standard 40-foot setback area required in the Shoreline Residential environment. In order to expand or redevelop these properties, the owners would be required to either comply with the setback requirement or implement components of the flexible shoreline setback regulations (SMP 4.B.4) in order to bring their property into compliance with the SMP. These setback reduction mechanisms include a series of incentive-based measures to encourage property owners to implement projects that would have a positive effect on shoreline ecological function. In return, they are allowed reductions to the minimum shoreline setback for their property. Setback reductions may be granted for a variety of enhancement actions, including the following:

- Removal of existing bulkheads,
- Preservation of native vegetation along the shoreline,
- Installation of biofiltration /infiltration mechanisms, such as rain gardens, bioswales, or other approved LID water treatment facilities,
- Installation of a LEED-approved green roof,

- Limiting on-site impervious surface to less than 5%,
- Preserving at least 20% the lot area outside the shoreline setback in native vegetation.

The SMP also includes standards to limit impacts to ecological function from new overwater structures. As described in Chapter 4.3, the SMP limits the size of new docks and piers based on their use. Currently, the median size of overwater structures on Lake Sawyer is approximately 462 square feet, and 96 structures are above the 600 square foot limit for single use piers. As these structures are replaced in the future, they will be required to conform to the new SMP regulations for structure size and materials, as well as provide adequate passage of light to the water below.

Over time, implementation of the SMP regulations is anticipated to improve ecological function in Segment A, particularly with regard to water quality, wave energy attenuation, and shoreline vegetation.

5.2.2 Segment B – Lake Sawyer Park Boat Launch

Anticipated Future Development

Extensive redevelopment is not anticipated to occur in this Segment. The Boat Launch Park is expected to remain in City ownership and continue its current use. The City’s Comprehensive Parks Plan identifies this site for additional future improvements, including increased parking, restrooms, and an access dock.

Resources at Risk

Upland Development Activities

Upland development in Segment B is anticipated to consist of improvements to the existing boat launch. These improvements will moderately increased impervious surface area and clear additional vegetation above the OHWM. These development activities have the potential to negatively impact hydrologic, vegetation, and habitat resources, as described in Section 4.2. Specifically, upland development activities would impact the following ecological processes and functions:

- Water and sediment storage;
- Removal of excess nutrients and toxic compounds;
- Recruitment of large woody debris and organic material;
- Improvement of water quality;
- Physical habitat space and conditions for life history; and
- Wildlife food production and delivery.

Nearshore Development Activities

Near-shore development in Segment B is anticipated to consist of improvements to the boat ramp. Shoreline modifications and stabilizations measures associated with the boat ramp could adversely affect hydrologic, vegetation, hyporheic, and habitat resources, as described in Section 4.2. Specifically, nearshore development activities would impact the following ecological processes and functions:

- Attenuation of wave energy;
- Recruitment of large woody debris and organic material;
- Sediment removal and bank stabilization
- Removal of excess nutrients and toxic compounds;
- Water storage;
- Vegetation support;
- Maintenance of base flows; and
- Physical habitat space and conditions for life history.

Overwater Development Activities

Overwater development in Segment B would consist of a new access dock associated with the existing boat ramp. The presence of new overwater structures can adversely affect hydrologic and aquatic habitat resources and would specifically impact the following ecological processes and functions:

- Attenuation of wave energy;
- Removal of excess nutrients and toxic compounds;
- Physical habitat space and conditions for life history; and
- Wildlife food production and delivery.

Effect of Proposed SMP Regulations

Upland Development Activities:

New upland improvements at the Boat Launch Park would be subject to the development standards of the Urban Conservancy environment, which limits impervious cover to 10% of site area (SMP 4.B.2). The site is currently estimated to be approximately 9% impervious cover, so the capacity for additional impervious surface is limited. The limit on impervious cover would ensure that the ability of water to infiltrate on the site is maintained and would minimize impacts on ecological function resulting from increased stormwater runoff, such as degraded water quality.

The SMP's General Shoreline Provisions for Environmental Impacts (SMP 3.B.4) state that all shoreline uses and activities shall utilize best management practices from the City's stormwater manual to minimize the effects of increased surface runoff. In addition, all land clearing, grading, and filling shall be the minimum amount necessary for development.

As described for Segment A, all development in the shoreline environment would be subject to the SMP's vegetation conservation regulations (SMP 3.B.7.c), which require that clearing of shoreline vegetation be kept to the minimum amount necessary for development. Additionally, any shoreline substantial development permit that entails tree removal and land clearing shall require a report from a qualified professional identifying appropriate mitigation measures to

assure no net loss of ecological function. Application of these regulations would minimize the adverse effects of upland development on vegetation and habitat functions.

Near-shore Development Activities:

Impacts on ecological functions in the near-shore area would primarily result from the presence of additional shoreline stabilization associated with improvements to the boat ramp. As described in Section 4.3, the SMP regulations strictly limit new shoreline armoring and structural shoreline stabilization measures, as well as repair and replacement of existing structures. Bio-engineered methods are preferred, and structural solutions are only allowed where it can be demonstrated that they are necessary to protect existing development (SMP 5.C.2.b.5).

Use-specific standards for boating facilities also require that existing boating facilities for motorized craft may be repaired, improved and reconfigured, but they shall not be expanded to accommodate a greater number of users without a conditional use permit and mitigation measures to address ongoing impacts (SMP 4.C.4.c.3).

Overwater Development Activities:

As described for Segment A, new overwater structures in the shoreline environment are subject to application of the SMP's overwater structure regulations (SMP 5.F.2.b). These regulations require that any components of overwater structures that contact the water shall be free of toxic substances that may contaminate the lake, thus protecting water quality. All new docks and piers must also incorporate materials that allow light penetration to the water below, thus reducing impacts on growth and behavior of aquatic organisms. Light penetration for overwater components is also required by the SMP's use-specific regulations for boating facilities (SMP 4.C.4.c.5.c).

Effect of Other Regulatory Requirements and Restoration Activities

As described for Segment A, the Washington Department of Fish & Wildlife, the U.S. Army Corps of Engineers, and the Washington State Department of Ecology would have jurisdiction over any work performed waterward of the OHWM and would have authority to review any improvements to the boat launch area and apply conditions and mitigation measures to assure no net loss of ecological function.

Net Effect on Ecological Performance

While the ecological performance of this area is already impaired, expansion of the boat launch has the potential to further degrade shoreline functions. However, upland improvements to the park would be required to adhere to the 10% impervious cover limit required in the Urban Conservancy environment, as well as vegetation preservation standards, both of which would help maintain the ability of water to infiltrate on the site and improve water quality.

As described in Section 4.3, the City's development plans for the boat launch improvements will address on-site drainage issues, include water quality control facilities, and include appropriate mitigation to ensure no net loss of ecological function, as required by the SMP. The SMP's use-specific standards for boating facilities, as described under Upland Development Activities, also

require mitigation measures for any boating facility expansion. Implementation of the SMP and planned restoration activities at the boat launch park is therefore anticipated to result in an increase in ecological function over time.

5.2.3 Segment C – Forested Single Family Parcel

Anticipated Future Development

While there is no indication that the current owner intends to redevelop the site, this Segment could potentially be subdivided to create up to ~~25 new shoreline frontage 22 lots~~ in shoreline jurisdiction if the necessary conditions were met, including extension of sanitary sewer service to the site. However, considering the SMP's requirements for no net loss of ecological function, preservation of native vegetation and mitigation for any removals, and public access, the actual number of lots that could be created by subdivision under the proposed SMP is likely to be substantially lower. Furthermore, the proposed special subdivision standards would require the creation of an open space tract that covers all areas with 75 feet of the OHWM that are not associated with the developed yard area of the parent lot and existing primary structure. We expect that only a few new lots could actually be created within shoreline jurisdiction if the requirements of the proposed SMP were adopted. Much more likely would be the creation of a significant number of upland lots and a common recreational tract encompassing a large portion of the current shoreline. Furthermore, the property is currently enrolled in the King County Public Benefit Rating System Open Space Taxation Program, and the property owners have made it clear that they have no current plans for development.

Resources at Risk

As described for Segment A, upland, nearshore, and overwater development associated with residential development of the site could potentially have adverse effects on habitat, vegetation, and hydrologic resources. However, subdivision and development of Segment C would have a much greater potential for negative effects to habitat and vegetation resources than Segment A, due to the ~~heavily~~ forested nature of the site and the relatively intact nature of most of the shoreline. The primary risks associated with the potential subdivision and development of Segment are associated with increased impervious surface coverage, clearing of shoreline and upland vegetation, introduction of shoreline armoring, and construction of overwater structures. However, with the addition of the proposed special subdivision regulations, we believe these risks are mitigated.

Effect of Proposed SMP Regulations

The proposed SMP would designate Segment C as Shoreline Residential. As described for Segment A, residential development would be subject to a maximum of 40% impervious site cover, and a maximum building footprint of 30% of site area. (SMP 4.B.2), and the use of LID construction techniques would be required to the maximum extent feasible, which would reduce impacts associated with increased impervious surface coverage by providing for infiltration and filtering of surface runoff, as well as replacing traditionally impervious surfaces with impervious materials.

Clearing of vegetation on the site would be subject to the SMP's standards for vegetation conservation (SMP 3.B.7.c), which require that clearing of shoreline vegetation be kept to the minimum amount necessary for development. Additionally, any development that entails tree removal and land clearing shall require a report from a qualified professional identifying appropriate mitigation measures to assure no net loss of ecological function.

While each single-family residence is typically allowed to construct a single-use dock or pier for boat moorage, the SMP would require any development of more than two residential dwellings to provide a joint-use or community access dock (SMP 5.F.2.b.6). Any future subdivision and development of Segment C would therefore require a single community pier, greatly reducing the potential for new overwater coverage. As described in Section 4.3, the SMP standards limit the size of new community piers with public access to 1,000 square feet, of which ~~4960~~40% must consist of a decking material that allows penetration of light to the water below. Effective overwater coverage in Segment C would therefore be limited to an increase of approximately 600 square feet.

Residential development of Segment C would also potentially increase the level of shoreline modification, including stabilization and armoring. However, as described in Section 4.3, the SMP regulations strictly limit new shoreline armoring and structural shoreline stabilization measures, as well as repair and replacement of existing structures. Bio-engineered methods are preferred, and structural solutions are only allowed where it can be demonstrated that they are necessary to protect existing development (SMP 5.C.2.b.5).

Effect of Other Regulatory Requirements and Restoration Activities

Any proposed in-water work would be reviewed by state and federal regulators, as described for Segments A and B. These agencies would have the authority to condition permits and require the implementation of best management practices and mitigation measures to assure no net loss of ecological function.

Net Effect on Ecological Performance

Because this area is anticipated to remain relatively unchanged for the foreseeable future, and ecological function is moderate/high, no net adverse effects on ecological performance are anticipated from implementation of the SMP in the immediate future. However, if sewer service is provided at a future date, the property owner may choose to sell or redevelop the parcel, ~~which may result in the potential for adverse impacts to the shoreline.~~ As discussed in the previous sections, the proposed SMP regulations would limit upland impervious surface, maintain the presence of shoreline vegetation, require mitigation for upland and aquatic impacts necessary to meet no net loss, and require the use of non-structural shoreline stabilization measures for any future development, thus protecting ecological function on the site⁴. Furthermore, with the addition of the proposed special subdivision regulations, we believe the proposed SMP would result in no net loss of shoreline ecological functions on this site.

⁴The SMP regulations should be able to maintain or improve upon current function if the property remains in its current ownership and use as a large lot residential property, but due to the relatively undeveloped nature of this property, achieving no net loss will be a challenge if subdivision and residential development is allowed in the future. It may be necessary to consider additional restrictions on subdivision or more specific standards in order to assure no net loss.

5.2.4 Segment D – Islands

Anticipated Future Development

Additional future development in this segment is highly unlikely due to the lack of adequate utilities (including adequate sanitation) and the low potential that utility services will be extended to the islands in the future. In addition, the SMP regulations state that residential development must achieve no net loss, and development on the islands is unlikely to be able to meet that standard. As such, future development on the islands is ~~extremely~~ unlikely to be permitted.

Resources at Risk

Residential development of the site could potentially have adverse effects on habitat, vegetation, and hydrologic resources. These potential impacts are increased because of the small area of the islands and the proximity of any future development to the shoreline. As described in Section 4.3, no significant future development is anticipated in Segment D.

Effect of Proposed SMP Regulations

The Shoreline Residential Limited environment restricts new development until urban services, such as potable water, electricity, and sanitary waste disposal are available. (SMP 2.D.2.d) If and when development is allowed, property owners would need to comply with the proposed SMP standards for setbacks, impervious surface coverage, and LID techniques. Additionally, repair or replacement of existing overwater structures is more likely and such activity would require compliance with the proposed SMP standards for size and materials. As described in Section 4.3, repair and replacement of existing docks is anticipated to occur over time and would result in a net reduction in impacts from overwater shading as piers and docks incorporated more fish-friendly materials and design features.

Effect of Other Regulatory Requirements and Restoration Activities

Any proposed in-water work would be reviewed by state and federal regulators. These agencies would have the authority to condition permits and require the implementation of best management practices and mitigation measures to assure no net loss of ecological function.

Net Effect on Ecological Performance

The potential for new development in this analysis segment is low, due to lack of adequate utilities. If adequate utilities are provided or available due to changes in sanitation codes and technologies, SMP regulations will improve ecological performance by requiring property owners who expand or rebuild to do so in compliance with the proposed policies and regulations, including conversion to soft shoreline armoring methods, preservation of shoreline vegetation, and reconstruction of docks and piers to meet current standards for protection of water quality and aquatic habitat.

5.2.5 Segment E – Lake Sawyer Regional Park and Adjacent Residential

Anticipated Future Development

Segment E consists of the Lake Sawyer Regional Park, as well as a privately owned parcel zoned for single-family residential use immediately north of the park. As described in Section 4.2, the City's 2008 Lake Sawyer Park Development Concept Plan indicates that future development for those portions of the park within the shoreline jurisdiction will consist primarily of passive recreational facilities such as trails, picnic areas, and open space. The residential parcel is not anticipated to develop in the immediate future, but if sanitary sewer service were to become available in the area, the property could potentially be subdivided. Based on the presence of wetlands on this site, we expect that subdivision would create up to 22-3 new shoreline frontage lots in shoreline jurisdiction. However, it is unlikely that the property would be subdivided to this degree, given the SMP's requirement that residential development achieve no net loss of ecological function. Full development of the site in a traditional subdivision pattern would make it extremely difficult to comply with the vegetation preservation, public access, and no net loss requirements of the SMP. Therefore, it is anticipated that, if the property were to subdivide at some future time, the actual number of shoreline lots created would be substantially less than this. Pursuant to the proposed special subdivision standards, it is likely that an open space tract would be created along the shoreline to provide recreational access for upland lots.

Resources at Risk

Upland Development Activities

Upland development in Segment E is anticipated to be primarily recreational in nature. The creation of trails and other improvements in the shoreline area would moderately increase impervious surface coverage and clearing of vegetation, but the primary purpose of the park development is to preserve and enhance the park's natural amenities. Upland park development would neutral or very mildly negative effect on ecological resources, which is likely to be balanced by planned habitat restoration activities.

Though subdivision of the vacant residential parcel north of the regional park is not currently anticipated due to lack of sewer service, future residential development of this parcel would result in have the potential to negatively impact hydrologic, vegetation, and habitat resources, as described in Section 4.2. Specifically, upland residential development activities would impact the following ecological processes and functions:

- Water and sediment storage;
- Removal of excess nutrients and toxic compounds;
- Recruitment of large woody debris and organic material;
- Improvement of water quality;
- Sediment removal and bank stabilization
- Physical habitat space and conditions for life history; and
- Wildlife food production and delivery.

Nearshore Development Activities

Potential near-shore development in Segment E could consist of construction of a canoe/kayak launch area at Lake Sawyer Regional Park. While plans for park improvements are still preliminary, any work in the near-shore associated with the canoe/kayak launch that would require shoreline stabilization or clearing of vegetation has the potential to adversely affect hydrologic, vegetation, hyporheic, and habitat resources, as described in Section 4.2. Specifically, nearshore development activities would impact the following ecological functions/processes:

- Attenuation of wave energy;
- Recruitment of large woody debris and organic material;
- Sediment removal and bank stabilization;
- Removal of excess nutrients and toxic compounds; and
- Physical habitat space and conditions for life history.

If the residential parcel north of the park were to develop in the future in a manner that required shoreline stabilization, impacts to near-shore resources and ecological processes would be similar to those discussed for Segment A, specifically:

- Attenuation of wave energy;
- Recruitment of large woody debris and organic material;
- Sediment removal and bank stabilization
- Removal of excess nutrients and toxic compounds;
- Water storage;
- Vegetation support;
- Maintenance of base flows; and
- Physical habitat space and conditions for life history.

Overwater Development Activities

Overwater development in Segment E would occur at the fishing point, as described in the 2008 Lake Sawyer Park Development Concept Plan. As summarized in Table 4, construction of this fishing pier would result in an increase in overwater coverage of approximately 1,000 square feet. While construction plans for the park are not complete, the presence of overwater structures can adversely affect hydrologic and habitat resources and construction could interfere with the following ecological functions/processes:

- Attenuation of wave energy;
- Removal of excess nutrients and toxic compounds;
- Physical habitat space and conditions for life history; and
- Wildlife food production and delivery.

As described in Section 4.3, overwater development at the residential parcel north of the regional park would consist of a single community access dock, as required by SMP regulations (SMP 5.F.2.b.6). As summarized in Table 4, residential overwater development in Segment E is anticipated to result in a net increase in overwater coverage of approximately 1,000 square feet. The presence of overwater structures can adversely affect hydrologic and aquatic habitat resources and would specifically impact the following ecological processes and functions:

- Attenuation of wave energy;
- Removal of excess nutrients and toxic compounds;
- Physical habitat space and conditions for life history; and
- Wildlife food production and delivery.

Effect of Proposed SMP Regulations

Upland Development Activities

New upland improvements at the Lake Sawyer Regional Park would be subject to the development standards of the Urban Conservancy environment, which limits impervious cover to 10% of site area (SMP 4.B.2). The SMP's vegetation conservation regulations (SMP 3.B.7.c) also require that clearing of shoreline vegetation be kept to the minimum amount necessary for development. Additionally, any shoreline development that entails tree removal and land clearing shall require a report from a qualified professional identifying appropriate mitigation measures to assure no net loss of ecological function. Application of these regulations would ensure that upland development in the park would not adversely affect the ability of water to infiltrate on the site, preserving water quality in Lake Sawyer.

Use-specific regulations for recreational development also state that public and private recreational development shall protect native vegetation and restore any areas disturbed by development (SMP 4.C.7.c.2).

Future residential development on the privately owned parcel north of the regional park would be governed by the same SMP regulations described for residential development in Segment A.

Nearshore Development Activities

Impacts on ecological functions in the near-shore area would primarily result from the construction of shoreline stabilization associated with park improvements, such as the proposed canoe/kayak launch area. The SMP strictly limits new structural stabilization measures, as well as the replacement of existing stabilization structures with similar measures (SMP 5.2.b.1). Structural methods can only be used after demonstrating that they are necessary to protect existing development. As the site is currently undeveloped, any new stabilization necessary at the launch area would have to be non-structural in nature, which would promote attenuation of wave energy, prevent barriers to subsurface groundwater exchange, and not limit the recruitment of organic material on the shoreline.

Near-shore construction activities would also be subject to the SMP's vegetation conservation regulations (SMP 3.B.7.c), as well as use-specific regulations for recreational development (SMP

4.C.7.c.2), as described for Upland Development Activities. Preservation of native shoreline vegetation would promote habitat function and augment the ability of the site to naturally filter stormwater runoff.

Future residential development on the privately owned parcel north of the regional park requiring shoreline stabilization would be governed by the same SMP regulations described for near-shore development in Segment A.

Overwater Development Activities

As described for Segments A and B, new overwater structures in the shoreline environment are subject to application of the SMP's overwater structure regulations (SMP 5.F.2.b). These regulations require that any components of overwater structures that contact the water shall be free of toxic substances that may contaminate the lake, thus protecting water quality. All new docks and piers must also incorporate materials that allow light penetration to the water below, thus reducing impacts on growth and behavior of aquatic organisms. Light penetration for overwater components is also required by the SMP's use-specific regulations for boating facilities (SMP 4.C.4.c.5.c).

The ~~proposed potential~~ fishing ~~and public access point pier~~ at the regional park would also be subject to the size limit imposed by SMP 5.F.2.b.18, which requires that total surface area for public piers be no greater than 1000 square feet. This size requirement would further limit adverse effects on sediment transport and habitat.

Any new overwater structures associated with future residential development on the privately owned parcel north of the regional park would be governed by the same SMP regulations described for overwater development in Segment A.

Effect of Other Regulatory Requirements and Restoration Activities

As described for Segments A and B, the U.S. Army Corps of Engineers, the Washington Department of Fish & Wildlife, and the Washington State Department of Ecology would have jurisdiction of any work performed waterward of the OHWM and would have authority to review any shoreline improvements in the park and apply conditions and mitigation measures to assure no net loss of ecological function.

In addition to regulatory oversight, the City's development plans for the Park include several habitat restoration projects and the removal of existing timber bulkheads along the park shoreline. These restoration and enhancement activities would reduce the amount of structural armoring in Segment E, remove a barrier to the attenuation of wave energy, and improve the available for habitat areas for local wildlife, thus providing a benefit to ecological function in Segment E.

Net Effect on Ecological Performance

While this area currently exists in a relatively undeveloped state, overall ecological function is moderate due to extensive shoreline modification. Upland areas are relatively undisturbed, and impervious surface coverage is very low. Development of the site for recreational uses would slightly increase impervious cover and may require moderate clearing of vegetation. However,

the provisions of the SMP would ensure that shoreline vegetation is protected, maintain the ability of water to infiltrate on the site, preserve lake water quality, and mitigate any impacts from development on the site.

The SMP would also improve near-shore functions over the long term by facilitating removal of shoreline armoring. As noted in Section 4.3, the timber bulkheads present along the park shoreline are beginning to fail, and the City plans to replace them with soft armoring solutions as part of the ongoing park development. Use of these non-structural stabilization methods, would allow for a gradual increase in net ecological performance along the park shoreline.

5.2.6 Segment F – Lake Sawyer Regional Park Wetland

Anticipated Future Development

Due to the presence of the large wetland complex that characterizes this segment, no development or alteration of ecological processes in this segment are anticipated. Development in Segment F is heavily restricted, both by the City's adopted Critical Areas Ordinance and by the development standard for the Natural environment, which allow a maximum impervious and building coverage of 5% and prohibit subdivision. SMP vegetation conservation standards also require the preservation of native understory vegetation and trees within the Natural environment in shoreline setback areas, further reducing potential for development.

Effect of Proposed SMP Regulations

While no development is anticipated within this segment, regulations for the Natural environment designation (SMP 4.B) would apply, including prohibitions against most development types.

The SMP's General Shoreline Provisions for Environmental Impacts (SMP 3.B.4.c) state:

- “Land clearing, grading, filling and alteration of natural drainage features and land forms shall be limited to the minimum necessary for development. When required by the Public Works Director, surface drainage systems or substantial earth modifications shall be designed by a civil engineer registered in the State of Washington. The Director may also require additional studies prepared by a qualified soils specialist. These designs shall seek to prevent maintenance problems, avoid adverse impacts to adjacent properties or shoreline features, and result in no net loss of shoreline ecological functions.”
- “All shoreline uses and activities shall utilize best management practices (BMPs) to minimize any increase in surface runoff and to control, treat and release surface water runoff so that receiving water quality and shore properties and features are not adversely affected. BMPs are identified in the City's adopted stormwater manual.”

Use-specific SMP regulations for recreational development (SMP 4.C.7) include:

- “Private and public recreation areas shall protect existing native vegetation in the shoreline area and restore vegetation impacted by development activities. Recreational use and development shall result in no net loss of shoreline ecological functions. Mitigation shall be provided as necessary to meet this requirement. Failure to meet this

standard will result in permit denial. The City may request necessary studies prepared by qualified professionals to determine compliance with this standard.”

“Fragile and unique shoreline areas with valuable ecological functions, such as wildlife habitats, shall be used only for non-intensive recreation activities that do not involve the construction of structures.”

Effect of Other Regulatory Requirements and Restoration Activities

As described for Segment A, in addition to the provisions of the SMP, the City’s Sensitive Areas Ordinance (BDMC 19.10) governs development that may have adverse impacts on environmentally sensitive areas, such as wetlands, fish and wildlife conservation areas, geologically hazardous areas, critical aquifer recharge areas, and frequently flooded areas. BDMC 19.10 requires the implementation of measures to limit alteration of sensitive areas and ensure no net loss of ecological function. The presence of the wetland complex in this analysis segment would make any proposed development in the area subject to these requirements.

As described in the other segments, any proposed in-water work, including work in wetlands, would be reviewed by state and federal regulators. These agencies would have the authority to condition permits and require the implementation of best management practices and mitigation measures to assure no net loss of ecological function.

Net Effect on Ecological Performance

Implementation of the SMP policies and regulations, coupled with the application of the Sensitive Areas Ordinance, ensures that ecological performance in this segment will not be degraded relative to current conditions.

5.2.7 Summary of Cumulative Impacts

Table 5 summarizes the potential for cumulative impacts within each analysis segment.

Table 5. Summary of Cumulative Impacts

Potential Alteration and Resource at Risk	Effect of Proposed SMP Policies and Regulations	Effect of Other Regulatory Requirements and Restoration Activities	Net Effect on Ecological Performance
Segment A (Residential) – Shoreline Residential			
<p><u>Upland Development Activities:</u> Increased impervious surface and vegetation clearing may negatively impact hydrologic, vegetation, and habitat resources, specifically water storage and quality, recruitment of LWD, bank stabilization, and wildlife food production and delivery.</p> <p><u>Nearshore Development Activities:</u> Shoreline modification and stabilization activities associated with residential development may negatively affect hydrologic, hyporheic, vegetation, and habitat resources, specifically attenuation of wave energy, recruitment of LWD, water storage and quality, habitat space and maintenance of base flows.</p> <p><u>Overwater Development Activities:</u> Overwater development is anticipated to consist of approximately 50-55 new docks and piers and gradual replacement/repair of existing structures. Increased overwater coverage can adversely affect hydrologic and habitat functions, specifically attenuation of wave energy, water quality, and food and forage requirements for aquatic organisms.</p>	<p><u>Impervious Surface Increases:</u></p> <ul style="list-style-type: none"> • Development in Shoreline Residential Environment would be subject to a maximum limit of 40% impervious surface and 30% building footprint (SMP 4.B.2). • SMP would require the use of all feasible LID techniques to minimize impervious surface and promote infiltration of runoff (SMP 4.B.3-4). • SMP would require treatment of all stormwater runoff before discharge to the lake (SMP 4.C.8). <p><u>Vegetation Clearing:</u></p> <ul style="list-style-type: none"> • SMP would require compliance with vegetation conservation standards to minimize vegetation clearing and maintain the site’s ability to naturally filter surface water runoff (SMP 3.B.7.c). <p><u>Shoreline Stabilization:</u></p> <ul style="list-style-type: none"> • SMP limits new structural stabilization measures, preferring bio-engineered and non-structural solutions. Structural solutions would only be allowed to protect existing development where non-structural methods would not provide adequate protection (SMP 5.2.b.1). <p><u>Overwater Structures:</u></p> <ul style="list-style-type: none"> • SMP limits the size of overwater structures and requires that decking material allow at least 40% of light to penetrate to the water below (SMP 5.F.2.b). • SMP would require joint-use docks or piers for 	<p><u>Critical Areas Ordinance:</u> Applicable section of Black Diamond’s critical areas ordinance (BDMC 19.10) have been incorporated into the proposed SMP to protect environmentally sensitive areas.</p> <p><u>State and Federal Review:</u> WDFW, U.S. Army Corps of Engineers, and Washington Department of Ecology each have regulatory authority to review development activities taking place in or over water, including wetlands. Permits for in-water work may be required from each of these agencies on a project-specific basis, allowing each agency to impose design and mitigation requirements to avoid and minimize adverse environmental impacts.</p>	<p>Application of the SMP regulations and policies will result in a net improvement in ecological function over time, particularly with regard to water quality, wave energy attenuation, and shoreline vegetation.</p>

Potential Alteration and Resource at Risk	Effect of Proposed SMP Policies and Regulations	Effect of Other Regulatory Requirements and Restoration Activities	Net Effect on Ecological Performance
	developments of more than two residences. Parcels being subdivided into 3 or more lots would be required to provide common access instead of allowing individual docks (SMP 5.F.2.b).		
Segment B (Lake Sawyer Park Boat Launch) – Urban Conservancy			
<p><u>Upland Development Activities:</u> Increased impervious surface and vegetation clearing may negatively impact hydrologic, vegetation, and habitat resources, specifically water storage and quality, recruitment of LWD, bank stabilization, and wildlife food production and delivery.</p> <p><u>Nearshore Development Activities:</u> Shoreline modification and stabilization activities associated with improvements to the boat ramp may negatively affect hydrologic, hyporheic, vegetation, and habitat resources, specifically attenuation of wave energy, recruitment of LWD, water storage and quality, habitat space and maintenance of base flows.</p> <p><u>Overwater Development Activities:</u> Overwater development is anticipated to consist of a single access dock associated with the boat launch. Increased overwater coverage can adversely affect hydrologic and habitat functions, specifically attenuation of wave energy, water quality, and food and forage</p>	<p><u>Impervious Surface Increases:</u></p> <ul style="list-style-type: none"> • Development in Urban Conservancy Environment would be subject to a maximum limit of 10% impervious surface (SMP 4.B.2). • SMP would require that all shoreline uses and activities utilize best management practices for stormwater to minimize effect of increased runoff (SMP 3.B.4). • SMP would require treatment of all stormwater runoff before discharge to the lake (SMP 4.C.8). <p><u>Vegetation Clearing:</u></p> <ul style="list-style-type: none"> • SMP would require compliance with vegetation conservation standards to minimize vegetation clearing and maintain the site’s ability to naturally filter surface water runoff (SMP 3.B.7.c). <p><u>Shoreline Stabilization:</u></p> <ul style="list-style-type: none"> • SMP limits new structural stabilization measures, preferring bio-engineered and non-structural solutions. Structural solutions would only be allowed to protect existing development where non-structural methods would not provide adequate protection (SMP 5.2.b.1). <p><u>Overwater Structures:</u></p> <ul style="list-style-type: none"> • SMP limits the size of overwater structures and requires that decking material allow at least 	<p><u>Critical Areas Ordinance:</u> Applicable section of Black Diamond’s critical areas ordinance (BDMC 19.10) have been incorporated into the proposed SMP to protect environmentally sensitive areas.</p> <p><u>State and Federal Review:</u> WDFW, U.S. Army Corps of Engineers, and Washington Department of Ecology each have regulatory authority to review development activities taking place in or over water, including wetlands. Permits for in-water work may be required from each of these agencies on a project-specific basis, allowing each agency to impose design and mitigation requirements to avoid and minimize adverse environmental impacts.</p>	<p>Implementation of the SMP regulations, as well as on-site water quality control features and shoreline restoration activities, is anticipated to result in a net improvement in ecological function in Segment B.</p>

Potential Alteration and Resource at Risk	Effect of Proposed SMP Policies and Regulations	Effect of Other Regulatory Requirements and Restoration Activities	Net Effect on Ecological Performance
requirements for aquatic organisms.	40% of light to penetrate to the water below (SMP 5.F.2.b).		
Segment C (Forested Single Family Parcel) – Shoreline Residential			
<p><u>Upland Development Activities:</u> If the parcel is allowed to subdivide and develop for residential uses, increased impervious surface and vegetation clearing may negatively impact hydrologic, vegetation, and habitat resources, specifically water storage and quality, recruitment of LWD, bank stabilization, and wildlife food production and delivery.</p> <p><u>Nearshore Development Activities:</u> Shoreline modification and stabilization activities associated with any future residential development may negatively affect hydrologic, hyporheic, vegetation, and habitat resources, specifically attenuation of wave energy, recruitment of LWD, water storage and quality, habitat space and maintenance of base flows.</p> <p><u>Overwater Development Activities:</u> Overwater development would consist of a single community use dock. Increased overwater coverage from this structure can adversely affect hydrologic and habitat functions, specifically attenuation of wave energy, water quality, and food and forage requirements for aquatic organisms.</p>	<p><u>Impervious Surface Increases:</u></p> <ul style="list-style-type: none"> • Development in Shoreline Residential Environment would be subject to a maximum limit of 40% impervious surface and 30% building footprint (SMP 4.B.2). • SMP would require the use of all feasible LID techniques to minimize impervious surface and promote infiltration of runoff (SMP 4.B.3-4). • SMP would require treatment of all stormwater runoff before discharge to the lake (SMP 4.C.8). <p><u>Subdivision and Vegetation Clearing:</u></p> <ul style="list-style-type: none"> • All areas within 75 feet of the OHWM would be protected in an open space tract if the property were subdivided. (SMP 4.C.8.c.3) • No new structures would be allowed with 100 feet of the OHWM on new lots created through subdivision. (SMP 4.C.8.c.3) <p>• SMP would require compliance with vegetation conservation standards to minimize vegetation clearing and maintain the site’s ability to naturally filter surface water runoff (SMP 3.B.7.c).</p> <p><u>Shoreline Stabilization:</u></p> <ul style="list-style-type: none"> • SMP limits new structural stabilization measures, preferring bio-engineered and non-structural solutions. Structural solutions would only be allowed to protect existing development where non-structural methods would not provide 	<p><u>Critical Areas Ordinance:</u> Applicable section of Black Diamond’s critical areas ordinance (BDMC 19.10) have been incorporated into the proposed SMP to protect environmentally sensitive areas.</p> <p><u>State and Federal Review:</u> WDFW, U.S. Army Corps of Engineers, and Washington Department of Ecology each have regulatory authority to review development activities taking place in or over water, including wetlands. Permits for in-water work may be required from each of these agencies on a project-specific basis, allowing each agency to impose design and mitigation requirements to avoid and minimize adverse environmental impacts.</p>	<p>If Segment C remains in its current use, implementation of the SMP is anticipated to have no net adverse effects on shoreline function. However, if the property is subdivided for residential development, it may be difficult to achieve no net loss. With the standards in the revised Draft SMP, including the special subdivision standards, we expect implementation of the Draft SMP will result in no net loss of ecological functions.</p>

Potential Alteration and Resource at Risk	Effect of Proposed SMP Policies and Regulations	Effect of Other Regulatory Requirements and Restoration Activities	Net Effect on Ecological Performance
	<p>adequate protection (SMP 5.2.b.1).</p> <p>Overwater Structures:</p> <ul style="list-style-type: none"> • SMP limits the size of overwater structures and requires that decking material allow at least 4060% of light to penetrate to the water below (SMP 5.F.2.b). • SMP would require a joint-use dock or pier in this Segment if the parcel is subdivided into 3 or more lots (SMP 5.F.2.b). 		
Segment D (Islands) – Shoreline Residential Limited			
<p>Upland Development Activities: No significant upland development activities are anticipated. Some existing residences may expand, but no No new development isresidences are likely to be constructed due to unavailability of utilities. <u>Most development requires a conditional use permit to ensure scrutiny.</u></p> <p>Nearshore Development Activities: No new shoreline modifications are anticipated on the islands, but existing armoring may require repair or replacement as it ages. At this time, property owners would be required to convert to non-structural systems in compliance with the SMP.</p> <p>Overwater Development Activities: No construction of new overwater structures is anticipated on the islands. Existing structures may be replaced as they age, at which point property</p>	<p>Shoreline Stabilization:</p> <ul style="list-style-type: none"> • SMP limits new structural stabilization measures, preferring bio-engineered and non-structural solutions. Structural solutions would only be allowed to protect existing development where non-structural methods would not provide adequate protection (SMP 5.2.b.1). <p>Overwater Structures:</p> <ul style="list-style-type: none"> • SMP limits the size of overwater structures and requires that decking material allow at least 4060% of light to penetrate to the water below (SMP 5.F.2.b). <p>Impervious Surface Increases:</p> <ul style="list-style-type: none"> • <u>Development in Shoreline Residential Environment would be subject to a maximum limit of 30% impervious surface and 20% building footprint (SMP 4.B.2).</u> • <u>SMP would require the use of all feasible LID techniques to minimize impervious surface and promote infiltration of runoff (SMP 4.B.3-4).</u> • <u>SMP would require treatment of all stormwater</u> 	<p>Critical Areas Ordinance: Applicable section of Black Diamond’s critical areas ordinance (BDMC 19.10) have been incorporated into the proposed SMP to protect environmentally sensitive areas.</p> <p>State and Federal Review: WDFW, U.S. Army Corps of Engineers, and Washington Department of Ecology each have regulatory authority to review development activities taking place in or over water, including wetlands. Permits for in-water work may be required from each of these agencies on a project-specific basis, allowing each agency to impose design and mitigation requirements to avoid and minimize adverse environmental impacts.</p>	<p>Due to the very low potential for new development in this Segment and the eventual conversion of existing shoreline armoring and overwater structures to comply with the proposed SMP standards, ecological function on the islands is anticipated to improve over time.</p>

Potential Alteration and Resource at Risk	Effect of Proposed SMP Policies and Regulations	Effect of Other Regulatory Requirements and Restoration Activities	Net Effect on Ecological Performance
owners would be required to comply with the proposed SMP standards.	runoff before discharge to the lake (SMP 4.C.8). <ul style="list-style-type: none"> • 		
Segment E (Lake Sawyer Regional Park) – Urban Conservancy			
<p><u>Upland Development Activities:</u> Upland recreational development at the park is anticipated to moderately increase impervious surface and vegetation clearing at the park. Residential development at the parcel north of the park may also increase impervious surface, clear vegetation, and disrupt habitat areas. These activities may negatively impact hydrologic, vegetation, and habitat resources, specifically water storage and quality, recruitment of LWD, bank stabilization, and wildlife food production and delivery.</p> <p><u>Nearshore Development Activities:</u> Development at the park would actively reduce the amount of shoreline modification present by removing existing armoring and converting to bio-engineered stabilization measures when necessary. Shoreline modification and stabilization activities associated with residential development on the adjacent private parcel may negatively affect hydrologic, hyporheic, vegetation, and habitat resources, specifically attenuation of wave</p>	<p><u>Impervious Surface Increases:</u></p> <ul style="list-style-type: none"> • Development at the park would be subject to the Urban Conservancy environment’s maximum limit of 10% impervious surface (SMP 4.B.2). • Development in Shoreline Residential Environment would be subject to a maximum limit of 40% impervious surface and 30% building footprint (SMP 4.B.2). • SMP would require the use of all feasible LID techniques to minimize impervious surface and promote infiltration of runoff (SMP 4.B.3-4). • SMP would require treatment of all stormwater runoff before discharge to the lake (SMP 4.C.8). <p><u>Subdivision and Vegetation Clearing:</u></p> <ul style="list-style-type: none"> • SMP would require compliance with vegetation conservation standards to minimize vegetation clearing and maintain the site’s ability to naturally filter surface water runoff (SMP 3.B.7.c). Subdivision not allowed in Park. In other areas, all areas within 75 feet of the OHWM would be protected in an open space tract if the property were subdivided (SMP 4.C.8.c.3) • No new structures would be allowed with 100 feet of the OHWM on new lots created through subdivision (SMP 4.C.8.c.3) • SMP would require compliance with vegetation conservation standards to minimize vegetation 	<p><u>Critical Areas Ordinance:</u> Applicable section of Black Diamond’s critical areas ordinance (BDMC 19.10) have been incorporated into the proposed SMP to protect environmentally sensitive areas.</p> <p><u>State and Federal Review:</u> WDFW, U.S. Army Corps of Engineers, and Washington Department of Ecology each have regulatory authority to review development activities taking place in or over water, including wetlands. Permits for in-water work may be required from each of these agencies on a project-specific basis, allowing each agency to impose design and mitigation requirements to avoid and minimize adverse environmental impacts.</p>	<p>Implementation of the SMP regulations, combined with the planned restoration projects planned for the regional park, such as bulkhead removal and shoreline vegetation planting, are anticipated to increase shoreline ecological function over time. Development at the residential property north of the park is not anticipated to occur in the immediate future, and SMP regulations would limit subdivision in order to achieve no net loss.</p>

Potential Alteration and Resource at Risk	Effect of Proposed SMP Policies and Regulations	Effect of Other Regulatory Requirements and Restoration Activities	Net Effect on Ecological Performance
<p>energy, recruitment of LWD, water storage and quality, habitat space and maintenance of base flows.</p> <p><u>Overwater Development Activities:</u> Overwater development at the park is anticipated to consist of a single fishing pier. The SMP would require future overwater construction at the residential parcel would be a single community dock. Increased overwater coverage can adversely affect hydrologic and habitat functions, specifically attenuation of wave energy, water quality, and food and forage requirements for aquatic organisms.</p>	<p>clearing and maintain the site's ability to naturally filter surface water runoff (SMP 3.B.7.c).</p> <ul style="list-style-type: none"> • <u>Shoreline Stabilization:</u> <ul style="list-style-type: none"> • SMP limits new structural stabilization measures, preferring bio-engineered and non-structural solutions. Structural solutions would only be allowed to protect existing development where non-structural methods would not provide adequate protection (SMP 5.2.b.1). • <u>Overwater Structures:</u> <ul style="list-style-type: none"> • SMP limits the size of overwater structures and requires that decking material allow at least 4960% of light to penetrate to the water below (SMP 5.F.2.b). • SMP would require joint-use docks or piers for developments of more than two residences. Parcels being subdivided into 3 or more lots would be required to provide common access instead of allowing individual docks. Development of the residential parcel would be required to comply with this standard (SMP 5.F.2.b). 		
Segment F (Lake Sawyer Regional Park Wetland) – Natural			
<p>No development is anticipated to occur in Segment F, due to the presence of a large wetland complex, which is protected by both the City's Critical Areas Ordinance and strict development standards for the Natural environment. SMP development standards require large setbacks, limit</p>	<p><u>Limits on Impervious Surface:</u></p> <ul style="list-style-type: none"> • SMP limits impervious surface and building coverage to 5% (SMP Chapter 4.Table 2). <p><u>Vegetation Preservation:</u></p> <ul style="list-style-type: none"> • SMP requires preservation of native understory vegetation and trees in the Natural environment (SMP 3.B.7). 	<p><u>Critical Areas Ordinance:</u> Applicable section of Black Diamond's critical areas ordinance (BDMC 19.10) have been incorporated into the proposed SMP to protect environmentally sensitive areas.</p> <p><u>State and Federal Review:</u></p>	<p>Adopted critical areas regulations and SMP provisions requiring vegetation preservation and limiting impervious cover are anticipated to prevent any net loss of ecological</p>

Potential Alteration and Resource at Risk	Effect of Proposed SMP Policies and Regulations	Effect of Other Regulatory Requirements and Restoration Activities	Net Effect on Ecological Performance
<p>impervious surface coverage, prohibit subdivision, and require extensive preservation of native vegetation.</p>	<ul style="list-style-type: none"> • Use-specific regulations for recreational development require protection and restoration of existing vegetation impacted by any development activities and mitigation to achieve no net loss (SMP 4.C.7). 	<p>WDFW, U.S. Army Corps of Engineers and Washington Department of Ecology each have regulatory authority to review development activities that impact wetlands. Permits for in-water work may be required from each of these agencies on a project-specific basis, allowing each agency to impose design and mitigation requirements to avoid and minimize adverse environmental impacts.</p>	<p>function in Segment E.</p>