

**CITY OF WOODLAND  
GRANT No. G1200052**

## **CUMULATIVE IMPACTS ANALYSIS**

---

### **City of Woodland's Shoreline Master Program**



Prepared for: Prepared for:  
The City of Woodland, on behalf of  
Cowlitz –Wahkiakum Council of Governments  
207 4<sup>th</sup> Avenue North  
Kelso, WA 98626

Prepared by:



**June 2015**

**The Watershed Company  
Reference Number:  
110922**

**Cite this document as:**

The Watershed Company. June 2015. Cumulative Impacts Analysis of the City of Woodland's Shoreline Master Program. Prepared for the City of Woodland, on behalf of the Cowlitz-Wahkiakum Council of Governments, Kelso, WA.

# TABLE OF CONTENTS

---

	Page #
<b>1 Introduction.....</b>	<b>5</b>
1.1 Document Overview.....	7
<b>2 Methodology .....</b>	<b>9</b>
2.1 Future Development .....	9
2.1.1 Analysis of Land Use Trends.....	9
2.1.2 Permit History Data Analysis Methodology.....	10
2.2 Likely Effects of Development .....	10
<b>3 Summary of Existing Conditions .....</b>	<b>11</b>
<b>4 Future Development .....</b>	<b>12</b>
4.1 Land Use Trends.....	12
4.2 Future Land Use Expectations.....	14
4.3 Potential Use Conflicts .....	14
<b>5 Effects of Development with Application of the SMP.....</b>	<b>15</b>
5.1 Shoreline Environment Designations.....	15
5.1.1 Shoreline Functions Related to Shoreline Environment Designations .....	18
5.2 Summary of Anticipated Future Land Use by Proposed Shoreline Environment Designation .....	19
5.3 General Standards and Use Regulations .....	23
5.3.1 Shorelines of Statewide Significance .....	23
5.3.2 No Net Loss of Ecological Functions.....	24
5.3.3 Critical Areas within Shoreline Jurisdiction.....	25
5.3.4 Flood Prevention and Flood Damage Minimization.....	28
5.3.5 Vegetation Conservation .....	30
5.3.6 Water Quality and Quantity .....	30
5.4 Use and Modification Provisions .....	31
5.4.1 Shoreline Stabilization.....	32

5.4.2	Breakwaters, Jetties, Groins, and Instream Structures .....	35
5.4.3	Flood Hazard Management Structures .....	37
5.4.4	Fill and Excavation .....	38
5.4.5	Dredging and Dredge Material Disposal .....	39
5.4.6	Aquaculture.....	41
5.4.7	Boat and Vessel Facilities, including Marinas .....	41
5.4.8	Commercial, Industrial, and Institutional Development .....	45
5.4.9	Agriculture and Forest Practices.....	47
5.4.10	Mining.....	49
5.4.11	Recreational Development.....	50
5.4.12	Residential Development .....	52
5.4.13	Transportation Facilities, including Parking .....	53
5.4.14	Utilities .....	55
5.4.15	Shoreline Habitat and Ecological Enhancement Projects .....	57
5.5	Shoreline Restoration Plan .....	58
<b>6</b>	<b>Effects of Other Programs .....</b>	<b>59</b>
6.1	Local Agencies/Regulations .....	59
6.1.1	City of Woodland Zoning Code.....	59
6.1.2	City of Woodland Stormwater Management Code.....	60
6.1.3	City of Woodland Erosion Control Ordinance.....	60
6.1.4	City of Woodland Comprehensive Flood Hazard Management Plan .....	60
6.2	State Agencies/Regulations .....	61
6.2.1	Washington Department of Natural Resources .....	61
6.2.2	Washington Department of Ecology .....	61
6.2.3	Washington Department of Fish and Wildlife.....	62
6.3	Federal Agencies/Regulations .....	62
6.3.1	Clean Water Act, Section 404.....	63
6.3.2	Rivers and Harbors Act, Section 10 .....	63
6.3.3	Federal Endangered Species Act (ESA) .....	63
<b>7</b>	<b>Summary Potential for Cumulative Impacts... ..</b>	<b>63</b>
<b>8</b>	<b>Net Effect on Ecological Function.....</b>	<b>64</b>
<b>9</b>	<b>References .....</b>	<b>67</b>

## LIST OF TABLES

---

Table 5-1.	Shoreline Use and Modification Regulations by Shoreline Environment Designation .....	20
------------	---------------------------------------------------------------------------------------	----

Table 5-2. Summary of anticipated land use in the City of Woodland by Shoreline Environment Designation..... 22

Table 5-3. Summary of key regulations related to shorelines of state-wide significance that protect ecological functions. .... 23

Table 5-4. Summary of key regulations related to no net loss that protect ecological functions..... 24

Table 5-5. Summary of key regulations related to critical areas within shoreline jurisdiction that protect ecological functions..... 26

Table 5-6. Summary of key regulations related to flood prevention and flood damage minimization that protect ecological functions. .... 29

Table 5-7. Summary of key regulations related to shoreline vegetation conservation that protect ecological functions. .... 30

Table 5-8. Summary of key regulations related to water quality and quantity that protect ecological functions. .... 31

Table 5-9. Summary of potential impacts from shoreline stabilization..... 33

Table 5-10. Summary of key shoreline stabilization regulations that protect ecological functions..... 33

Table 5-11. Summary of potential impacts from breakwaters, jetties, groins, and instream structures. .... 36

Table 5-12. Summary of key regulations related to breakwaters, jetties, groins, and instream structures that protect ecological functions. .... 36

Table 5-13. Summary of potential impacts from flood hazard management structures.37

Table 5-14. Summary of key regulations related to flood hazard management structures that protect ecological functions. .... 37

Table 5-15. Summary of potential impacts from fill and excavation. .... 38

Table 5-16. Summary of key regulations related to fill and excavation that protect ecological functions..... 39

Table 5-17. Summary of potential impacts from dredging and dredge material disposal. .... 40

Table 5-18. Summary of key regulations related to dredge and dredge material disposal that protect ecological functions. .... 40

Table 5-19. Summary of potential impacts from aquaculture. .... 41

Table 5-20. Summary of potential impacts from boat and vessel facilities. .... 42

Table 5-21. Summary of key regulations related to boat and vessel facilities that protect ecological functions. .... 42

Table 5-22. Summary of potential impacts from commercial and industrial development. .... 45

Table 5-23. Summary of key regulations related to commercial and industrial development that protect ecological functions..... 45

Table 5-24. Summary of potential impacts from agriculture and forest practices. .... 48

Table 5-25. Summary of key regulations related to agriculture and forest practices that protect ecological functions. .... 48

Table 5-26. Summary of potential impacts from mining. .... 49

Table 5-27. Summary of key regulations related to mining that protect ecological functions. .... 49

Table 5-28. Summary of potential impacts from recreational development. .... 51

Table 5-29. Summary of key regulations related to recreational development that protect ecological functions. .... 51

Table 5-30. Summary of potential impacts from residential development. .... 52

Table 5-31. Summary of key regulations related to residential development that protect ecological functions. .... 52

Table 5-32. Summary of potential impacts from transportation facilities, including parking. .... 53

Table 5-33. Summary of key regulations related to transportation facilities, including parking, that protect ecological functions..... 54

Table 5-34. Summary of potential impacts from utilities..... 56

Table 5-35. Summary of key utility regulations that protect ecological functions..... 56

Table 5-36. Summary of potential impacts from shoreline habitat and ecological enhancement projects. .... 57

Table 5-37. Summary of key regulations related to shoreline habitat and ecological enhancement projects that protect ecological functions. .... 57

# LIST OF FIGURES

---

Figure 1-1. Framework to achieve no net loss of ecological function. (Department of Ecology) ..... 6

Figure 5-1. Distribution of Shoreline Environment Designations in the City of Woodland (UGAs excluded). .... 17

Figure 5-2. Distribution of Shoreline Environment Designations in the City of Woodland Urban Growth Area..... 18

Figure 5-3. Distribution of Functional Scores among Proposed City of Woodland Environment Designations..... 19

# 1 INTRODUCTION

---

This Cumulative Impacts Analysis assesses the proposed City of Woodland (City) Shoreline Master Program (SMP) policies and regulations in relation to current shoreline conditions documented in the Shoreline Analysis Report (TWC and Parametrix 2014) to assess if future development approved under the proposed SMP could achieve no net loss of ecological function. This Cumulative Impacts Analysis can help the City make adjustments where appropriate in its proposed SMP if there are potential gaps between maintaining and degrading ecological functions.

The State Master Program Approval/Amendment Procedures and Master Program Guidelines (SMP Guidelines; WAC 173-26) 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 173-26-201(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 inventory and characterization 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 [Chapter 3 below and the Shoreline Analysis Report];
- (ii) reasonably foreseeable future development and use of the shoreline [Chapter 4 and Section 5.2 below, and the Shoreline Analysis Report]; and
- (iii) beneficial effects of any established regulatory programs under other local, state, and federal laws.” [Chapter 6 below]

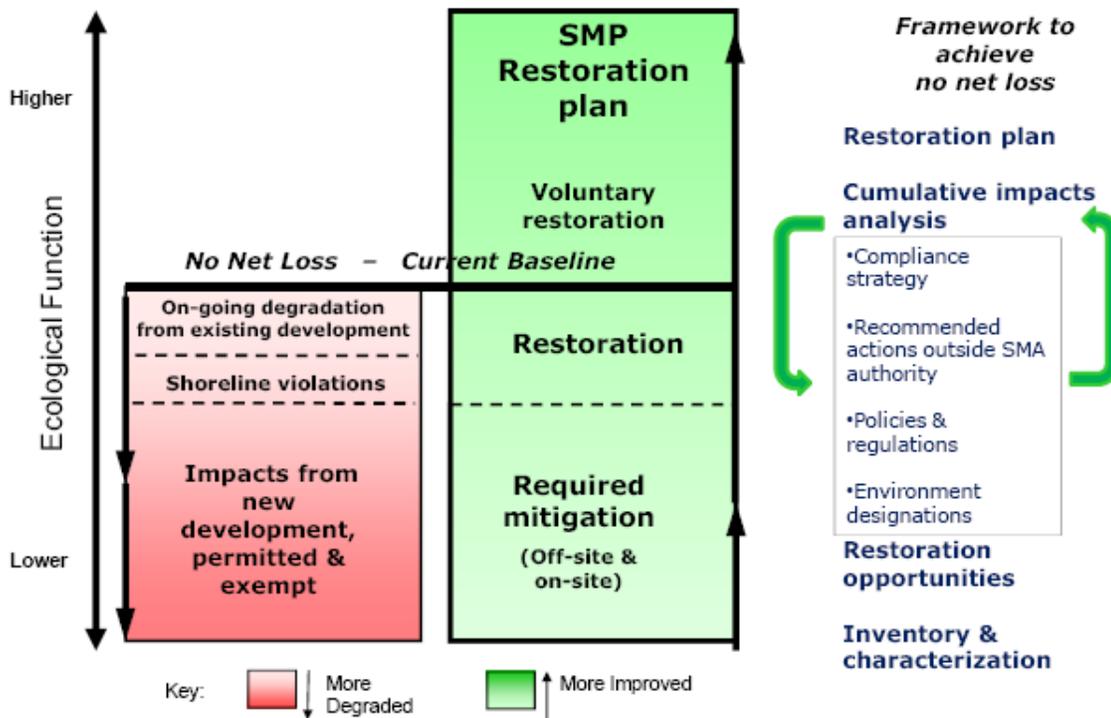


Figure 1-1. Framework to achieve no net loss of ecological function. (Department of Ecology)

The Cumulative Impacts Analysis assesses the policies and regulations in the draft SMP to determine whether no net loss of ecological function will be achieved as new development occurs. SMP regulations fundamentally rely on

the concept of mitigation sequencing to avoid, minimize, and mitigate for any unavoidable losses of function. An accompanying component of the SMP process that can bring environment conditions to an improved level is the Shoreline Restoration Plan, which identifies and prioritizes potential actions and programs that may be implemented on a voluntary basis. These actions, intended to improve existing environmental conditions through a combination of enhancement, restoration, and protection, cannot be required by SMP regulations, but Section 173-26-201(2)(f) of the Guidelines says: “master programs shall include goals, policies and actions for restoration of impaired shoreline ecological functions.” In certain communities or shoreline areas, the SMP may not be able to achieve no net loss of functions through regulations alone. For example, a community may expect a significant reduction in riparian vegetation coverage to accommodate a water-dependent use. Compensatory mitigation would be implemented to offset unavoidable impacts, perhaps through replanting of riparian vegetation in an adjacent site; however, it may take many years before the benefits from the compensatory mitigation are realized. In such a circumstance, as for others, the Shoreline Restoration Plan may help bridge the gap between the SMP-required mitigation outcome and no net loss of ecological function.

As the SMP is implemented, the City will need to identify methods to track shoreline conditions, permit activity, and policy and regulatory effectiveness. City planning staff will be required to track land use and development activity, including exemptions, within shoreline jurisdiction, and may incorporate actions and programs of the other departments as well. With each project application, staff should consider whether implementation of the SMP is meeting the basic goal of no net loss of ecological functions relative to the baseline condition established in the Shoreline Analysis Report. A complete reassessment of conditions, policies and regulations will be considered every eight years, during the scheduled SMP update (concurrent with the Comprehensive Plan update). To conduct a valid reassessment of the shoreline conditions, the City will need to identify metrics and then monitor, record and maintain key environmental metrics to allow a comparison with baseline conditions. As monitoring occurs, the City should assess environmental effects of development and restoration objectives. With this level of attention to conditions, permitted development, and adaptive management as needed in the long term, the City should be able to ensure that the regulations and mitigation sequencing required by the SMP will maintain shoreline functions over time.

## 1.1 Document Overview

The ultimate goal of this document is to determine whether future development in the City’s shorelines taking place under the proposed SMP would result in no net loss of ecological functions relative to the baseline conditions documented in

the Shoreline Analysis Report (The Watershed Company and Parametrix 2014). This section provides an overview of how this document is organized in order to achieve this goal.

To provide the reader with background on the existing conditions in the City's shorelines, a summary of existing conditions based on the Shoreline Analysis Report (The Watershed Company and Parametrix 2014) is provided in Chapter 3. More detailed analysis of specific shoreline functions, uses, and public access can be found in the Shoreline Analysis Report.

To understand what future development activities in the City's shorelines might occur that could alter existing conditions, Chapter 4 presents the brief results of an assessment of likely future development. This assessment is based on existing land use conditions, recent trends in land use changes, comprehensive plan designations, zoning, and input from City planners.

Chapter 5 is a key section of this cumulative impacts analysis. It describes how foreseeable development could affect shoreline conditions, and what specific provisions of the proposed SMP will help maintain existing conditions in spite of likely future development. Chapter 5 addresses the following:

- Environment designations and allowed uses relative to shoreline functions;
- Key general standards and regulations intended to protect the ecological functions of the shoreline ;
- An assessment of the anticipated future development for each shoreline use or modification, if allowed by available data;
- A summary of the potential impacts that could result from future development of the specific use or modification; and
- A summary of key regulations in the SMP that would avoid, minimize, or mitigate potential impacts.
- A discussion of the potential beneficial effects of the Shoreline Restoration Plan.

Chapter 6 describes the beneficial effects that other regulatory programs may have on the City's shorelines.

Finally, Chapter 7 and 8 pull together all the elements of the SMP and previously discussed background information and analysis to summarize whether and how

the SMP ensures no net loss of ecological functions in a way they can be easily digested by the reader.

## 2 METHODOLOGY

---

This Cumulative Impacts Analysis was prepared consistent with direction provided in the Shoreline Master Program Guidelines as described above. Existing conditions were first evaluated using the information, both textual and graphic, developed and presented in the Shoreline Analysis Report (TWC and Parametrix 2014). To the extent that existing information was sufficiently detailed and assumptions about possible new or re-development could be made with reasonable certainty, the following analysis is quantitative.

The analysis in this document focuses on incorporated shoreline areas in the City of Woodland, and does not address cumulative impacts to unincorporated shoreline areas within the City's Urban Growth Area (UGA). It is anticipated that the majority of development will occur once the area is annexed, and until that time, all unincorporated UGAs will be regulated under the County's SMP. In the case of annexation, the City would assign new shoreline environment designations (see Chapter 5.1, Shoreline Environment Designations), and amend this analysis to evaluate the effects of future development in the UGA on shoreline ecological functions.

### 2.1 Future Development

#### 2.1.1 Analysis of Land Use Trends

A comparative analysis of land use data for the years 2002 and 2012 was conducted to evaluate recent changes in land use, and assess the relative scale and types of land use change that may be anticipated in the future. Current land use data was obtained from the Cowlitz County Assessor's Office for 2002 and 2012. Changes in the type of land use are summarized for the City's shoreline areas and unincorporated UGA. The analysis approach is consistent with the approach detailed in the Shoreline Analysis Report (TWC and Parametrix 2014), except that the analysis was refined to only account for areas where 2002 and 2012 assessor data directly overlap.

Comparative analysis results are presented as the change in percent of total acreage from 2002 to 2012. The total area of developable vacant lands was calculated as parcels not characterized as resource lands (open space, agriculture, forestland, fishing activities, or other land use not associated with likely future development), nor publicly held and with an assessed improvement value of less

than \$10,000 were identified as developable vacant. Lands in PacifiCorp ownership were also excluded from the developable vacant lands assessment.

### **2.1.2 Permit History Data Analysis Methodology**

A review of shoreline development permits previously issued by the City of Woodland was undertaken in order to better understand the type and extent of recent development actions occurring in the City's shoreline areas, and to help anticipate future trends in shoreline land use changes and shoreline modifications. The development permits reviewed were limited to those issued between 2001 and 2011, the most recent ten-year period for which data was available.

Permits were classified by the type of shoreline use (e.g., residential, commercial) or shoreline modification (e.g., bank stabilization, boat launch) permitted. Where a single permit application involved multiple uses or modifications, a single permit was counted in each applicable use or modification category. Permits were recorded by year the permit was issued (not the application date).

It is worth noting that shoreline exemptions are generally not captured in the permit data. Therefore, no data on the type and extent of development actions exempt from shoreline permits (such as single-family residential housing development or single-family residential bulkhead construction) are available. Moreover, any unpermitted development is not reflected in the data.

## **2.2 Likely Effects of Development**

The effects of likely development were then evaluated in the context of SMP provisions, as well as other related plans, programs, and regulations. For the purpose of evaluating impacts, areas with a likelihood of high densities of new development were evaluated in greatest detail. Areas with limited or low density of projected new development were addressed in general terms without a site-specific discussion of conditions and functions.

Cumulative impacts were analyzed quantitatively where possible. Where specific details regarding redevelopment likelihood or potential were not available at a level that could be assessed quantitatively or the analysis would be unnecessarily complex to reach a conclusion that could be derived more simply, a qualitative approach was used.

### 3 SUMMARY OF EXISTING CONDITIONS

---

The City of Woodland is located on the Lewis River, and a portion of the City extends into Clark County. The City, covering 4.32 square miles (including a 2011 annexation of 483 acres), has a population of 5,509 according to the 2010 US Census, of which 5,426 live in the Cowlitz County and 83 live in Clark County. The City's Urban Growth Boundary includes 50 acres of unincorporated land, with an estimated population of 80 people using an average of 2.67 people per household. The City's UGA within shoreline jurisdiction is limited to the southeastern shoreline of Horseshoe Lake and approximately one mile of shoreline north of the City on the Lewis River.

The following summary of existing conditions is based on the Shoreline Analysis Report (TWC and Parametrix 2014). More detailed information on specific shoreline areas is provided in the Shoreline Analysis Report.

As described in the Shoreline Analysis Report, the City's northern shoreline area includes some of the highest functioning shorelines with substantial riparian vegetation and off-channel backwater habitats. Large woody debris is present in the backwater habitats, and is occasionally present along riparian habitats in the mainstem river. Mid-channel islands are vegetated with early colonizing shrubs and trees, providing instream habitat complexity. The City's floodway area provides significant hydrologic and vegetative functions. Approximately half of City shorelines are within the floodplain, and a third are within the floodway.

A small wetland is located along the Lewis River within the floodplain. This area is designated Urban Conservancy environment, and is part of a larger complex of potentially associated wetlands. Additionally, approximately two acres of UGA shoreline along the Lewis River are designated as priority habitat for cavity-nesting ducks.

Riparian vegetation is limited in the City's core downtown area. A levee channelizes the River through the City's core area. Levees occupy approximately 2800 linear feet of shoreline jurisdiction, all within City shorelines.

The City's shoreline on Horseshoe Lake is developed with roads, parks, and residential and commercial development. At least twelve overwater structures are present on Horseshoe Lake, associated with existing residential development. The lake shoreline also supports the City's only park, Horseshoe Lake Park, which comprises approximately six acres.

The majority of City shorelines (approximately 57 percent) are undeveloped. Single-family residential development is the second most prevalent land use,

occupying just over 21 acres, or approximately 18 percent of City shorelines. The Low density residential is the most prevalent zone on Woodland shorelines, occurring on 32 percent of City shorelines. Another 19 percent of City shorelines are zoned for high density residential. Commercial and Public zones each occupy approximately 11 percent of City shorelines.

## 4 FUTURE DEVELOPMENT

---

To understand what future development activities in the City’s shorelines might occur that could alter existing conditions, this chapter presents the results of an assessment of likely future development.

### 4.1 Land Use Trends

An assessment of recent trends in land use changes was completed in the Shoreline Analysis Report (The Watershed Company and Parametrix 2014). This analysis was completed based on the rationale that future changes in land use trends will be roughly comparable to past trends. This approach helps provide a realistic estimate of the level of foreseeable development, rather than looking exclusively at the area of developable lands.

Within the City, the area of vacant lands decreased by two acres, and land designated as undeveloped also decreased over the past ten years (Table 4-1). Parcel data inconsistencies created the appearance of a net loss in acreage from 2002 to 2012, which confounds interpretation of land use trends. The area designated as multi-family residential use decreased by five acres, while single family uses did not change appreciably. Based on these past trends in land use, continued gradual development of vacant and undeveloped lands is anticipated within the City. Growth in multi-family residential development is not expected in the foreseeable future.

Table 4-1. City of Woodland: Land use change 2002-2012.

Land Use Category	Incorporated City		
	2002	2012	<i>Change in Area</i>
<b>Undeveloped</b>	74 ac.	67 ac.	-7 ac.
<b>Single Family Residential</b>	20 ac.	21 ac.	+1 ac.
<b>Multi-Family Residential</b>	14 ac.	9 ac.	-5 ac.
<b>Commercial</b>	6 ac.	5 ac.	-1 ac.

Shoreline permits within City of Woodland from 2002 to 2012 indicate that development of residential, including subdivision of land, transportation, commercial, and recreation uses and shoreline stabilization has occurred (Table 4-2). If similar land use and permit trends continue in the future, gradual expansion of single-family residential uses, as well as ongoing maintenance activities related to transportation uses and occasional shoreline stabilization and dock modifications are likely to continue in the City.

Table 4-2. Ten-year permit history in the City of Woodland.

Reach	Permit Application	Activity	Location
Lewis 06 – Clark County – Horseshoe Lake	No substantial activity		
Lewis 07 – Clark County – Horseshoe Lake	No substantial activity		
Lewis 08 – City – Horseshoe Lake	202-933	Street reconstruction (Davidson & Goerig, from 5th to Bozarth)	S24, T5N,R1W
	210-925	Rocks to bolster road embankment	in ROW, E of S Pekin, SE of intersection of S Pekin & Windflower, and NE of 449 Windflower Dr.
	211-903	Construct 300' of sidewalk on W side of S Pekin Rd.	155 S Pekin Rd, parcel 5078
	204-907	Street reconstruction	Dunham Ave.
	205-920	3 lot subdivision	201 S Pekin Road
	205-947	Harmony Park, 21 lot subdivision.	East of the BNSF, west of S Pekin Rd adjacent to Horseshoe Lake
Lewis 09 – Woodland UGA/Clark County – Horseshoe Lake	203-931	Bulkhead and floating dock	354 Island Aire Dr, parcel 5-0645-515-039
	205-932	Removal of retaining wall + fill placed behind retaining wall	442 Island Aire Drive
Lewis 10 – City – Horseshoe Lake	202-933 (also in Lewis 8)	Street reconstruction (Davidson & Goerig, from 5th to Bozarth)	S24, T5N,R1W
	205-929	Outdoor skate park	Horseshoe Lake Park, S24, T5N, R1W, W.M.
Lewis 11 – City – Lewis River	No substantial activity		
Lewis 12 – City – Lewis River	204-908	Lewis River bridge seismic rehabilitation	CC Street, S19, T5N, R1E
	206-941	Ranney Well/Pump Replacement	1380 Lewis River Rd., parcel 5-056401.
	209-926	Establish restaurant in	1382 N Goerig, parcel 5-

Reach	Permit Application	Activity	Location
		with tavern, demo existing single family dwelling.	0564
Lewis 13 – City – Lewis River	206-918	Riverwood Short Plat. 4 lots	1772 Lewis River Rd
	206-904	Lewis River Front Park #4, 2.93 acres for 14 lot PURD.	1874 Lewis River Rd.
Lewis 14 – City – Lewis River	No substantial activity		
Lewis 15 – City – Lewis River	205-942	109 lot subdivision (Riverview Residential)	2215 Lewis River Road, between the State Highway and the Lewis River
Lewis 16 – City – Lewis River	No substantial activity		

## 4.2 Future Land Use Expectations

In addition to evaluating past land use changes, likely future changes in land use were assessed based on comprehensive plan designations, zoning, and input from City planning staff. As described in the Shoreline Analysis Report (The Watershed Company and Parametrix 2014), the shoreline areas with the greatest likelihood for future development within the City include the following:

- New low density residential development and infill of residential areas on Horseshoe Lake;
- Commercial development in the High Intensity designation on the Lewis River;
- Multi-family residential development landward of the City’s floodway area; and
- Low density residential development at the northern end of the City.

The effects of anticipated development with the application of the SMP will be discussed in Chapter 5.

## 4.3 Potential Use Conflicts

Woodland currently has no water oriented uses except for public recreation areas on Horseshoe Lake. The commercial areas along the Lewis River and Horseshoe Lake are likely to provide some water oriented uses as well as ecological enhancement and public access. These areas are largely abutted by commercial areas which are not likely to present use conflicts.

# 5 EFFECTS OF DEVELOPMENT WITH APPLICATION OF THE SMP

---

This chapter describes how foreseeable development could affect shoreline conditions, and what specific provisions of the proposed SMP will help maintain existing conditions in spite of likely future development. This chapter begins, in Section 5.1, with a summary of the City's proposed environment designation scheme and a discussion of how the scheme allocates allowed uses by relating environment designations to ecological functions. Section 5.2 evaluates where future land use changes are anticipated relative to proposed environment designations. Section 5.3 presents key general standards and regulations in the SMP intended to protect the ecological functions of the shoreline. Section 5.4 includes the following for each specific use or modification listed in the SMP:

- An assessment of the future development potential for the use or modification, if allowed by available data;
- A summary of the potential impacts that could result from future development of the specific use or modification; and
- A summary of key regulations in the SMP that would avoid, minimize, or mitigate potential impacts.

Chapter 5 concludes, in Section 5.5, with a discussion of the potential beneficial effects of voluntary actions identified in the Shoreline Restoration Plan (The Watershed Company 2015).

## 5.1 Shoreline Environment Designations

The first line of protection of the City's shorelines is the shoreline environment designation. According to the Guidelines (WAC 173-26-211), the assignment of shoreline environment designations must be based on the existing use pattern, the biological and physical character of the shoreline, and the goals and aspirations of the community as expressed through a comprehensive plan.

The assignment of environment designations can help minimize cumulative impacts by concentrating development activity in lower functioning areas that are not likely to experience significant function degradation with incremental increases in new development or redevelopment.

Consistent with the Guidelines, the City's proposed environment designation system is based on the existing use pattern, the biological and physical character of the shoreline, and community interests. The Shoreline Analysis Report provided information on shoreline conditions and functions that informed the

development of shoreline environment designations for each of the shoreline waterbodies. The proposed shoreline environment designations are as follows:

- Urban Conservancy
- Recreation
- Residential
- High Intensity
- Aquatic

The proposed upland shoreline environment designations are described in more detail below.

The **Urban Conservancy environment** is intended to protect and restore ecological functions of open space, floodplain and other sensitive lands while allowing a variety of compatible uses. Activities permitted in these areas are intended to have minimal adverse impacts upon the shoreline. The designation is assigned to areas appropriate and planned for development that is compatible with maintaining or restoring ecological functions. These are shoreline areas that are not generally suitable for water-dependent uses. Approximately 79 acres, or 47 percent, of the City's shorelines (see Figure 5-1) are designated Urban Conservancy.

The **Recreation environment** is intended to provide areas for new and continued recreational and public access opportunities along shorelines, including public and private parks and recreational facilities while maintaining ecological functions and open space. This environment is assigned to areas where public and private lands are devoted to or designated for recreation use including parks and open space and water-dependent uses such as marinas that provide recreational moorage, as well as where lands are not yet developed but are planned for water-oriented recreation. Approximately 8 acres, or 5 percent, of the City's shorelines (see Figure 5-1) are designated Recreation.

The purpose of the **Residential environment** is to accommodate residential development and appurtenant structures consistent with the SMP. The designation is assigned to shoreline areas that are predominantly single-family or multi-family residential development or are planned and platted for residential development. Approximately 51 acres, or 31 percent, of the City's shorelines (see Figure 5-1) are designated Residential.

The **High-Intensity environment** is intended to provide for high-intensity, water-oriented commercial, transportation, and industrial uses while protecting existing ecological functions and restoring ecological functions in areas that have been previously degraded. This designation is assigned to areas that currently

support or are planned for high-intensity uses related to commerce or transportation. Approximately 28 acres, or 17 percent, of the City’s shorelines (see Figure 5-1) are designated High-Intensity.

Finally, the **Aquatic environment** is intended to protect, restore, and manage the unique characteristics and resources of aquatic areas. The Aquatic Overlay has been assigned to waters and submerged lands in the City waterward of the ordinary high water mark of shorelines of the state.

As mentioned previously, prior to annexation, UGA shorelines are regulated under the County’s SMP, and are assigned shoreline environment designations by the County. As such, UGA shorelines may be assigned shoreline environment designations that are not defined in the City’s SMP. In the Woodland UGA, approximately 3 acres, or 11 percent, of shorelines are designated Natural environment under the County’s SMP. Additionally, approximately 9 acres, or 31 percent, of UGA shorelines are designated Rural Conservancy environment under the County’s SMP (see Figure 5-2). In the case of annexation, the City would assign new shoreline designations pursuant to its SMP, as described above.

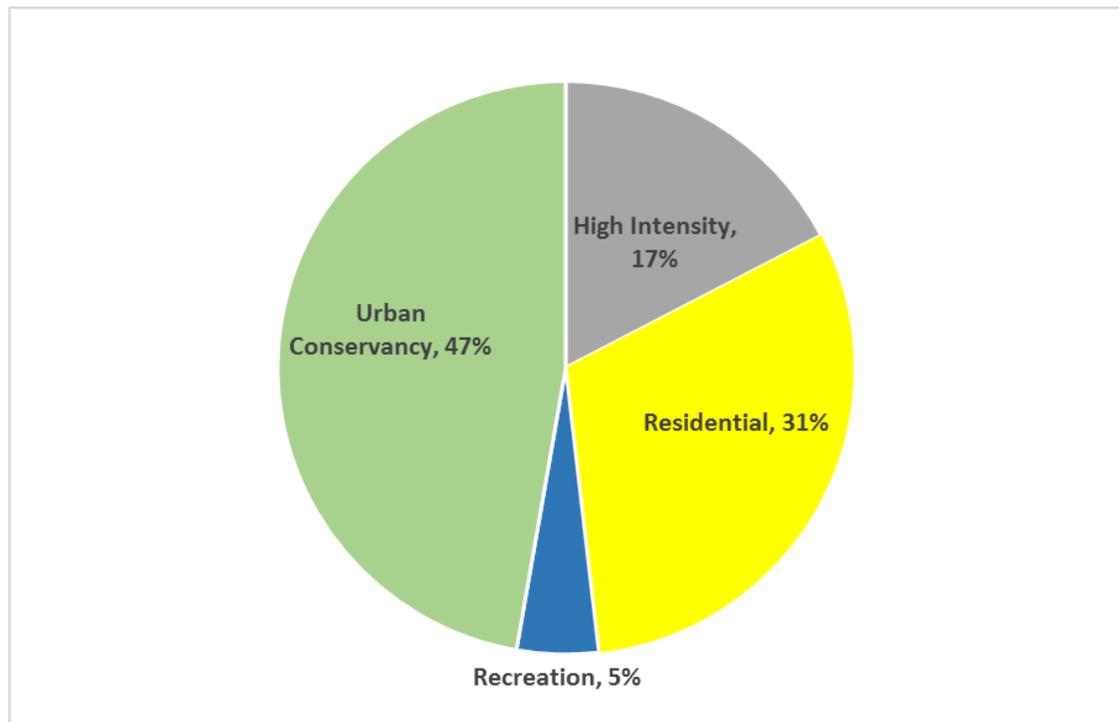


Figure 5-1. Distribution of Shoreline Environment Designations in the City of Woodland (UGAs excluded).

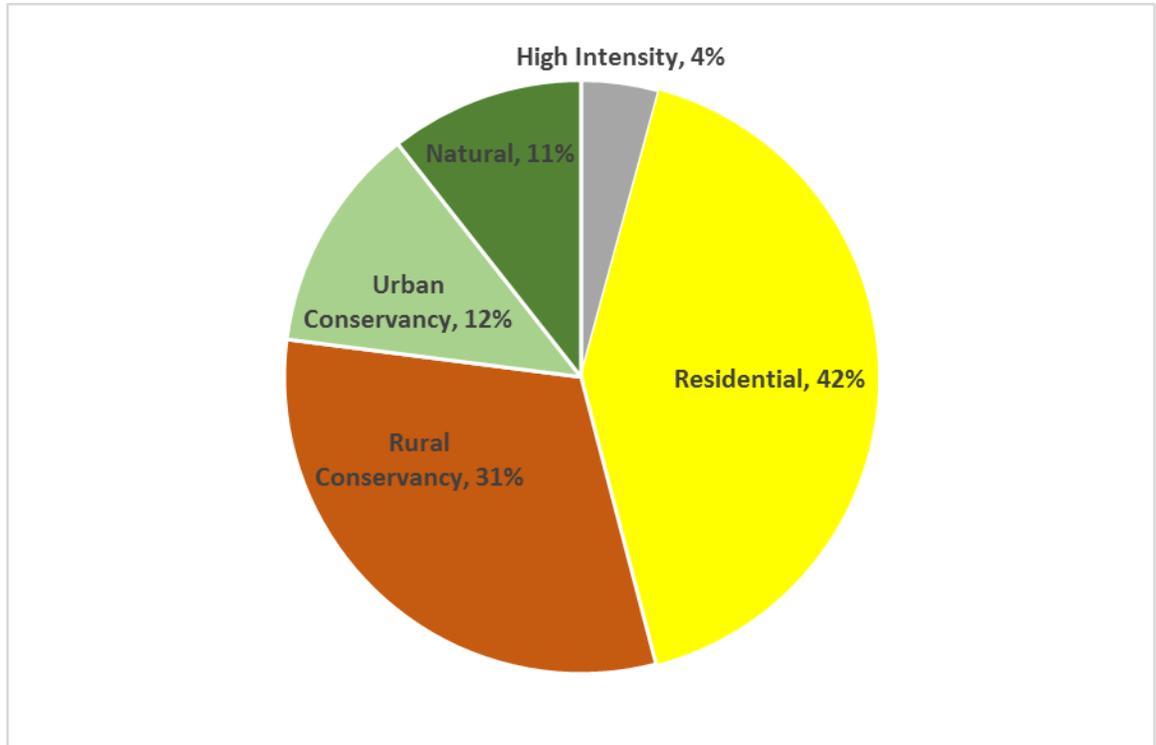


Figure 5-2. Distribution of Shoreline Environment Designations in the City of Woodland Urban Growth Area.

### 5.1.1 Shoreline Functions Related to Shoreline Environment Designations

The analysis of shoreline functions presented in the Shoreline Analysis Report was used to guide the assignment of environment designations. Figure 5-3 shows the distribution of functional scores among proposed environment designations within the City of Woodland.

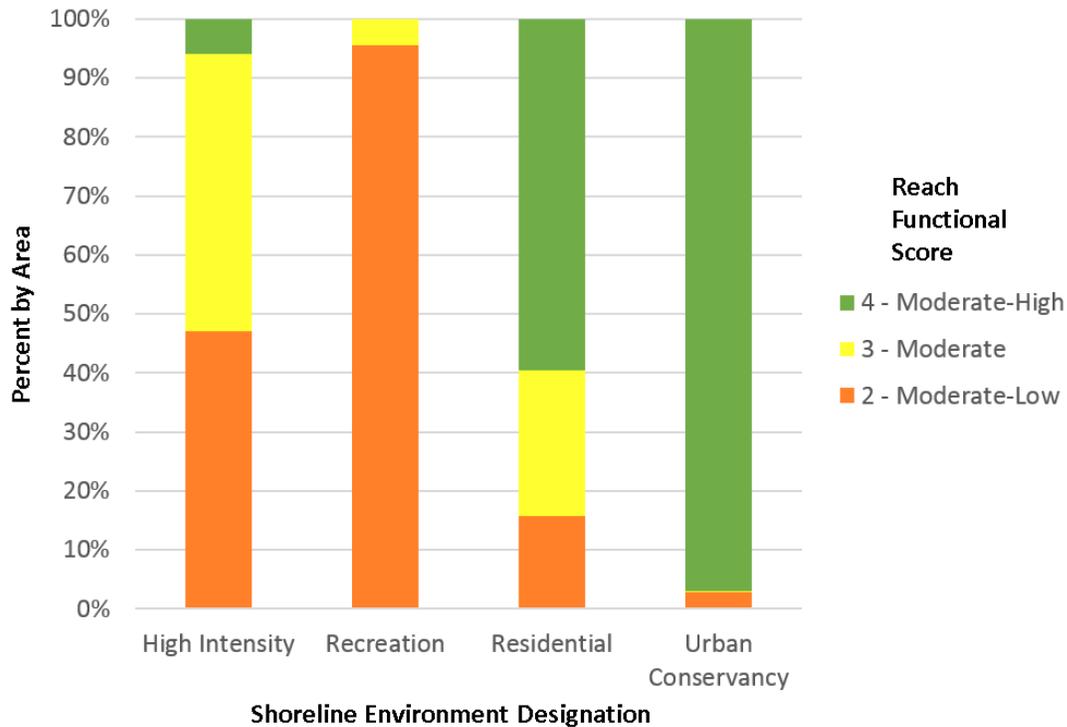


Figure 5-3. Distribution of Functional Scores among Proposed City of Woodland Environment Designations.

In the City of Woodland, the relationship between functional scores and environment designations in Figure 5-3 appears moderate. As expected, the more restrictive Urban Conservancy environment features almost exclusively shorelines with relatively high functional scores (mostly “moderate-high”). As far as the more permissive environments, as expected, the High Intensity environment primarily includes shorelines with lower functional scores (mostly “moderate” and “moderate-low”). However, the Recreation environment features relatively lower functional scores than expected. These low scores (“moderate-low”) are associated with the shoreline along Horseshoe Lake Park, and comprise the only Recreation designated shorelines in the City.

## 5.2 Summary of Anticipated Future Land Use by Proposed Shoreline Environment Designation

Shoreline environment designations define which uses and modifications are allowed within shoreline jurisdiction, which are conditionally allowed, and which are prohibited. Table 5-1 (modified from Table 7-1 in the proposed SMP) lists allowed, conditionally allowed, and prohibited uses for each shoreline environment designation. Allowed uses (“P” and “CU” in the Table 5-1) must obtain a shoreline substantial development permit or shoreline conditional use permit. Furthermore, allowed uses are subject to the general provisions of the

SMP (see Section 5.3), as well as the provisions specific to that use or modification (see Section 5.4). These provisions minimize adverse impacts from shoreline uses, and help ensure that such uses result in no net loss of ecological functions.

Table 5-1. Shoreline Use and Modification Regulations by Shoreline Environment Designation

<b>Table Key:</b> P = May be permitted through SSDP or SLE SCUP = May be permitted through SCUP X = Prohibited N/A = Not Applicable	<b>Shoreline Environment Designations</b>				
	<b>High-Intensity</b>	<b>Residential</b>	<b>Urban Conservancy</b>	<b>Recreation</b>	<b>Aquatic</b>
<b>Uses</b>					
<b>Agriculture</b>	X	X	X	X	X
<b>Aquaculture</b>	P	P	P	P	P
<b>Boating Facilities</b>					
Boat launches	P	X	P	P	P
Other Moorage	P	X	P	P	P
<b>Commercial</b>					
Water-dependent	P	P	X	X	SCUP
Water-related	P	P	X	X	X
Water-enjoyment	P	P	P	P	SCUP
Non-water-oriented	P	X	X	X	X
<b>Forest Practices</b>	X	X	X	X	X
<b>Industrial</b>					
Water-dependent	P	X	X	X	P
Other water-oriented	P	X	X	X	X
Non-water-oriented	P	X	X	X	X
<b>Institutional</b>	P	X	X	X	X
<b>Mining</b>	X	X	X	X	SCUP
<b>Recreation</b>					
Water-dependent	P	P	P	P	P
Other water-oriented	P	P	P	P	SCUP
Non-water-oriented	P	SCUP	X	SCUP	X
<b>Residential</b>					
Single-family	P	P	P	P	X
Multi-family	P	P	X	X	X

<b>Table Key:</b> P = May be permitted through SSDP or SLE SCUP = May be permitted through SCUP X = Prohibited N/A = Not Applicable	<b>Shoreline Environment Designations</b>				
	<b>High-Intensity</b>	<b>Residential</b>	<b>Urban Conservancy</b>	<b>Recreation</b>	<b>Aquatic</b>
New floating residence	X	X	X	X	X
<b>In-stream structures</b>	P	P	P	P	P
<b>Transportation</b>					
Roads and railroads	P	P	P	P	SCUP
Bridges	P	P	P	P	P
Non-motorized facilities	P	P	P	P	SCUP
Parking as an accessory to a permitted use	P	P	P	P	X
<b>Utilities</b>	P	P	P	P	SCUP
<b>Uses not Specified</b>	SCUP	SCUP	SCUP	SCUP	SCUP
<b>Modifications</b>					
<b>Flood Control Works</b>					
Modification of Existing Flood Control Works (including relocation further landward)	P	P	P	P	SCUP
New Flood Control Works	P	P	SCUP	SCUP	X
<b>Residential Moorage Facilities</b>					
Buoys	N/A	N/A	N/A	N/A	P
Docks	X	P	X	X	P
Marine Railways	X	P	P	X	P
<b>Shoreline Stabilization</b>					
New soft structural stabilization	P	P	P	P	P
Replacement soft structural stabilization	P	P	P	P	P
New hard structural stabilization	SCUP	SCUP	SCUP	SCUP	SCUP
Replacement hard structural	P	P	P	P	P
<b>Breakwaters, Jetties, Rock Weirs, and Groins</b>	SCUP	SCUP	SCUP	SCUP	SCUP

<b>Table Key:</b> P = May be permitted through SSDP or SLE SCUP = May be permitted through SCUP X = Prohibited N/A = Not Applicable	Shoreline Environment Designations				
	High-Intensity	Residential	Urban Conservancy	Recreation	Aquatic
<b>Fill / Excavation</b>	P	P	P	P	SCUP
<b>Dredge and Dredge Material Disposal</b>					
Dredging	N/A	N/A	N/A	N/A	P
Dredge disposal	P	SCUP	SCUP	SCUP	SCUP
<b>Shoreline Habitat and Ecological Enhancement</b>	P	P	P	P	P

While Table 5-1 presents the list of *possible* uses within each environment designation, Table 5-2 below presents a summary of *likely* development by environment designation, based on information gathered as part of the Shoreline Analysis Report (TWC and Parametrix 2014). Table 5-2 also summarizes factors that may affect future development potential within each environment designation. These factors are not intended to be a comprehensive list of which SMP provisions would apply; instead, they are intended to highlight the regulatory and/or physical factors that would most limit future development.

Table 5-2. Summary of anticipated land use in the City of Woodland by Shoreline Environment Designation.

Shoreline Environment Designation	Anticipated Future Use	Factors Affecting Development Potential
High Intensity	<ul style="list-style-type: none"> <li>• New commercial uses on vacant commercial parcels next to I-5</li> <li>• Likely redevelopment of existing shopping center</li> <li>• Light industrial</li> <li>• Site plan for an area between the state airport and CC Street for a multi-building retail commercial development that covers over 5 acres</li> </ul>	Development would be limited by shoreline buffers, and subject to provisions for Commercial or Industrial development, as applicable.
Residential	<ul style="list-style-type: none"> <li>• High-, medium-, and low-density residential development likely in vacant parcels</li> <li>• Most of Horseshoe Lake shoreline within the City is built out</li> </ul>	Much of the Residential environment is separated from the Lewis River by Urban Conservancy-designated shoreline and/or by dikes.

Shoreline Environment Designation	Anticipated Future Use	Factors Affecting Development Potential
	<ul style="list-style-type: none"> <li>Some new low-density development once UGA shorelines are annexed</li> </ul>	Development must be outside of the floodway and shoreline buffer. In all cases, development along the Lewis River would be subject to floodplain development regulations.
Urban Conservancy	<ul style="list-style-type: none"> <li>In the City along the Lewis River, no development is expected as the entire area is within the designated floodway.</li> <li>In the segment along Horseshoe Lake in the UGA, future subdivision and residential development is expected.</li> </ul>	Development would be limited by floodway areas and shoreline and wetland buffers.
Recreation	<ul style="list-style-type: none"> <li>Future recreational development at Horseshoe Lake Park is planned.</li> </ul>	A vegetation management plan will need to be developed prior to further recreational development.

### 5.3 General Standards and Use Regulations

General standards and use regulations are contained in SMP sections 5.4 and 6. These provisions include several standards and regulations intended to protect ecological functions of the shoreline and to prevent adverse cumulative impacts. Key regulations protective of ecological functions, grouped by SMP section, are listed below.

#### 5.3.1 Shorelines of Statewide Significance

Lewis River shorelines within the City's jurisdiction are shorelines of statewide significance. Because these shorelines are major resources from which all people in the state derive benefit, this jurisdiction gives preference to uses which favor long-range goals and support the overall public interest (Table 5-3).

Table 5-3. Summary of key regulations related to shorelines of state-wide significance that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
<b>Shorelines of Statewide Significance (5.4)</b>	Recognize and protect statewide interest over local interest; solicit comments, opinions, and advice from individuals with expertise in ecology and other scientific fields pertinent to shoreline management. (A.)(1.)(c.)	X	X	X	X

	Preserve the natural character of the shoreline. a. Designate and administer shoreline environments and use regulations to minimize damage to the ecology and environment of the shoreline; b. Restore, enhance, and/or redevelop those areas where intensive development or uses already exist rather than allowing high-intensity uses to extend into low-intensity areas; c. Protect and preserve existing diversity of vegetation and habitat values, wetlands, and riparian corridors associated with shoreline areas. (A.)(2.)	X	X	X	X
	Support actions that result in long-term over short-term benefit. b. Protect resources and values of shorelines of statewide significance for future generations by modifying or prohibiting development that would irretrievably damage shoreline resources. (A.)(3.)	X	X	X	X
	Protect the resources and ecological function of the shoreline. a. Minimize development activity that will interfere with the natural functioning of the shoreline ecosystem. b. All shoreline development should be located, designed, constructed and managed to avoid disturbance of and minimize adverse impacts to wildlife resources. c. Restrict or prohibit public access onto areas which cannot be maintained in a natural condition under human use. d. Shoreline materials should be left undisturbed by shoreline development. Gravel mining should be severely limited in shoreline areas. e. Preserve environmentally sensitive wetlands and encourage restoration of presently degraded wetland areas. (A.)(4.)	X	X	X	X

\*An “X” indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

### 5.3.2 No Net Loss of Ecological Functions

The SMP includes provisions that require mitigation sequencing, which involves first avoiding, then minimizing any impacts (Table 5-4). Where impacts are unavoidable, compensatory mitigation is required, as well as monitoring. These provisions apply to all shoreline uses and modifications, and should help ensure that no net loss of functions is maintained on a cumulative basis in the City.

Table 5-4. Summary of key regulations related to no net loss that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
<b>No Net Loss</b>	All shoreline use and development shall be located,	X	X	X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
of Ecological Functions (6.1)	designed, constructed, conducted, and maintained in a manner that maintains shoreline ecological functions, in accordance with the mitigation sequencing provisions of the SMP. (A.)				
	Shoreline ecological functions that shall be protected include, but are not limited to, fish and wildlife habitat, food web support, and water quality maintenance. (B.)	X	X	X	X
	Shoreline processes that shall be protected include, but are not limited to, water flow; erosion and accretion; infiltration; groundwater recharge and discharge; sediment delivery, transport, and storage; large woody debris recruitment; organic matter input; nutrient and pathogen removal; and stream channel formation/maintenance. (C.)	X	X	X	X
	In-water work shall be scheduled to protect biological productivity. (D.)				X
	Mitigation sequencing is required. (E.)	X	X	X	X
	Burden of proof of no net loss is on the applicant. (F.)	X	X	X	X

\*An "X" indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

### 5.3.3 Critical Areas within Shoreline Jurisdiction

The proposed SMP requires that activities within shoreline jurisdiction comply with the Shoreline Critical Areas Regulations found in Appendix B of the SMP. These regulations are based on the Woodland Municipal Code (WMC) Chapter 15.08 and have been modified to comply with the provisions of the Washington State Shoreline Management Act.

#### General Provisions

The SMP includes provisions that apply generally to all critical areas within shoreline jurisdiction, and that are intended to protect the ecological processes and functions of those critical areas (Table 5-5). Regulations for wetlands, fish, and wildlife habitat conservation areas, frequently flooded areas, and geologic hazard areas within shoreline jurisdiction are found in Appendix B of the SMP, Shoreline Critical Areas Regulations.

Table 5-5. Summary of key regulations related to critical areas within shoreline jurisdiction that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
<b>Critical Areas Protection: General Provisions (6.3.2)</b>	Shoreline uses, activities, developments, and associated structures and equipment shall be located, designed, and operated to protect the ecological processes and functions of critical areas. (A.)	X	X	X	X
	Where appropriate, new and expanded development proposals shall integrate protection of wetlands, fish and wildlife habitat, and flood hazard reduction with other stream management provisions, such as retention of channel migration zones, to the extent that they are within the shoreline jurisdictional area and ensure no net loss of ecological functions. (B.)	X	X	X	X
	Critical areas within shoreline jurisdiction shall be regulated for any use, development, or activity as provided in accordance with the SMP and Appendix B whether or not a permit is required. (C.)	X	X	X	X
	If provisions of Appendix B and other parts of the SMP conflict, the provisions most protective of ecological resources shall apply. (D.)	X	X	X	X
	Unless otherwise stated, critical area buffers shall be protected and regulated in accordance with the SMP and Appendix B. (E.)	X	X	X	X

\*An “X” indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

**5.3.3.1 Wetlands**

Under the proposed SMP, activities within wetlands or wetland buffer areas may only be permitted if the proposed activity will not degrade the functions and values of the wetland. Proposed activities in wetlands or their buffers must provide a critical area report, prepared by a qualified professional, that includes an assessment of wetlands and buffers as well as a habitat and native vegetation plan (SMP Appendix B (5.3)). An activity will only be permitted if the applicant can demonstrate that it will not degrade the functions and values of the wetland or other critical areas (SMP Appendix B (5.4)(A.)).

Standard buffers for wetlands in shoreline jurisdiction (SMP Appendix B (5.5)(B.)(Table B-1)) range from 25 feet to 300 feet depending on the wetland category (as determined by the Washington State Wetland Rating System for

Western Washington (Ecology Publication #14-06-007, or as revised)), habitat score and/or water quality score, and the intensity of the proposed land use. The buffer of a created, restored, or enhanced wetland shall be in conformance with the expected category of the wetland upon maturity (SMP Appendix B (5.5)(A.)). Standard buffer widths assume a naturally vegetated state (SMP Appendix B (5.5)(B.)).

Wetland buffer averaging (SMP Appendix B (5.5)(E.)) is allowed provided specific criteria are met, including that averaging will not reduce wetland functions or values, and that the buffer width will not be reduced to less than 75 percent of the standard buffer width. Buffer reduction (SMP Appendix B (5.5)(D.)) is also allowed based on modification of land use intensity, provided that all applicable measures to minimize the impacts of adjacent land uses on wetlands are applied.

### **5.3.3.2 Fish and Wildlife Habitat Conservation Areas**

The proposed SMP includes Fish and Wildlife Habitat Conservation Area (FWHCA) buffers for all streams and waterbodies within shoreline jurisdiction. Proposed revisions to the critical areas regulations apply shoreline buffers based on reach to all shoreline waterbodies (SMP Appendix B (9.4)(D.)(2.)(Table B-4)). These reach-based buffers were derived from an evaluation of reach-specific conditions, including width and condition of existing vegetation, existing barriers to habitat functions, and overall reach functions, as determined by the Shoreline Analysis Report (TWC and Parametrix 2014). This reach-based approach to buffer standards, where buffer standards are proposed based on existing conditions, is consistent with the concept of maintaining no net loss of shoreline ecological functions. Standard buffers on non-shoreline streams within shoreline jurisdiction range from 75-200 feet.

Buffer averaging (SMP Appendix B (9.4)(D.)(6.)) is allowed provided specific criteria are met, including that averaging will not degrade functions and the buffer width will not be reduced to less than 75 percent of the standard buffer in any given location. Certain uses, including water-dependent uses, linear transportation and utility crossings, and shoreline residential access pathways may be permitted in buffers, provided that any adverse impacts to ecological functions are mitigated (SMP Appendix B (9.4)(D.)(7.)).

### **5.3.3.3 Flood Hazard Areas**

Frequently flooded areas are regulated by WMC 14.40, Flood Damage Prevention, which is incorporated into the SMP by reference. These regulations prohibit new development or fill within the floodway that would result in a net rise in the base flood level (WMC 14.40.050(C.)). The SMP further requires that development within the floodway be demonstrated not to cause further

limitation of channel migration, and must include appropriate protection of ecological functions (SMP Appendix B (7.)(B.)). All lands identified in the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) as within the one-hundred-year floodplain are designated as frequently flooded areas (SMP Appendix B (7.)(A.)).

#### **5.3.3.4 Geologically Hazardous Areas**

Geologically hazardous areas include areas susceptible to erosion, sliding, earthquake or other geological events (SMP Appendix B (8.)(A.)). Regulations specific to geologically hazardous areas apply performance standards to minimize and manage risks and ecological impacts. Any development in a geologically hazardous area requires a geotechnical evaluation by a qualified professional.

In addition to a variety of development standards that limit the potential impacts of development in landslide and erosion hazard areas, a vegetated buffer is required. The minimum buffer distance requirements from the top of slope and toe of slope of the landslide or erosion hazard areas shall be the same as for setbacks from slopes as identified in the Uniform Building Code (SMP Appendix B (8.5.)(D.)(1.)).

#### **5.3.3.5 Critical Aquifer Recharge Areas**

To protect groundwater resources from contamination, the proposed SMP regulates or prohibits certain activities within critical aquifer recharge areas. These activities include landfills, underground injection wells, mining, wood treatment facilities, storage of radioactive materials, or any activity that significantly reduces aquifer recharge, flow, or quantity or quality (SMP Appendix B (6.5.)(A.)). Other activities, including storage tanks, reclaimed water, and vehicle repair and servicing, are subject to specific performance standards (SMP Appendix B (6.4.)). Hydrogeologic testing and site evaluation by a qualified professional may be required for any regulated activity (SMP Appendix B (6.2.)).

#### **5.3.4 Flood Prevention and Flood Damage Minimization**

In addition to flood hazard protections provided through shoreline critical areas regulations, the proposed SMP includes provision to reduce flood hazard, avoid increasing flood hazard, and minimize flood damage (Table 5-6). If strictly enforced, these provisions would be expected to protect ecological functions by restricting development within floodways. The provisions also define standards and regulations for flood hazard management structures, which are discussed in Section 5.4 of this document.

Table 5-6. Summary of key regulations related to flood prevention and flood damage minimization that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Flood Prevention and Flood Damage Minimization (6.4)	New residential, commercial, or industrial development and uses, including subdivision of land, within shoreline jurisdiction are prohibited if it would be reasonably foreseeable that the development or use would require structural flood hazard reduction measures in the floodway over the life the development. (B.)	X			X
	The following uses and activities may be authorized in floodways when otherwise permitted by the SMP: 1. Actions and development with a primary purpose of protecting or restoring ecological functions and ecosystem-wide processes. 4. Bridges, utility lines, water-dependent public utilities, and other public utility and transportation structures where no other feasible alternative exists, or where the alternative would result in unreasonable and disproportionate costs. Where such structures are allowed, mitigation shall address impacted functions and processes in the affected shoreline. 8. Measures to reduce shoreline erosion provided that it is demonstrated that the erosion rate exceeds that which would normally occur in a natural condition, that the measures do not interfere with fluvial hydrological and geomorphological processes normally acting in natural conditions, and that the measures include appropriate mitigation of impacts to ecological functions associated with the river or stream. (C.)	X			X
	Removal of materials for flood management purposes is allowed only after a biological and geomorphological study shows that extraction does not result in a net loss of ecological functions. (D.)	X	X	X	X

\*An "X" indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

### 5.3.5 Vegetation Conservation

The proposed shoreline vegetation conservation standards establish a mechanism to improve shoreline vegetative conditions in buffers that have previously been cleared or degraded (Table 5-7). If strictly enforced, the vegetation management plan requirement would be expected to result in an improvement in the condition and density of native shoreline vegetation and a reduction in invasive species coverage as development and redevelopment occur.

Table 5-7. Summary of key regulations related to shoreline vegetation conservation that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
<b>Vegetation Conservation (6.6)</b>	Shall comply with the setback and buffer provisions of the SMP and SMP Appendix B to protect and maintain shoreline vegetation. (A.)			X	
	Vegetation clearing in shoreline jurisdiction shall be limited to the minimum necessary to accommodate approved shoreline development. (B.)			X	
	Mitigation shall be required to ensure no net loss of ecological functions. Mitigation plans shall be approved and implemented before initiation of other permitted activities. (C.)	X	X	X	X
	Aquatic weed control shall only occur to protect native plant communities and associated habitats or where an existing water-dependent use is restricted by the presence of weeds. (D.)		X	X	X

\*An “X” indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

### 5.3.6 Water Quality and Quantity

The proposed SMP provisions help ensure that point-source and non-point-source pollution will be minimized, consistent with existing City policies (Table 5-8).

Table 5-8. Summary of key regulations related to water quality and quantity that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
<b>Water Quality and Quantity (6.7)</b>	All shoreline development shall comply with the applicable requirements of the City's adopted Comprehensive Stormwater Plan, Comprehensive Plan, and best management practices to prevent impacts to water quality and storm water quantity that would result in a net loss of shoreline ecological functions. (A.)	X	X		
	Stormwater management structures including ponds, basins, and vaults shall be located outside of SMA jurisdiction and fish and wildlife habitat buffers where possible. Low impact development facilities are encouraged. (B.)	X	X	X	
	Aerial application of pesticides, herbicides and fertilizers within shoreline jurisdiction is prohibited unless as part of a public agency program for control of noxious species, for quarantine or public health purposes, or for a crisis exemption. (C.)		X		
	To avoid water quality degradation, existing septic systems that fail or malfunction will be required to connect to an existing municipal sewer service system if feasible. Any new development will be required to connect to an existing municipal sewer service system if feasible. (D.)		X		

\*An "X" indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

### 5.4 Use and Modification Provisions

The SMP contains numerous shoreline modification and use policies and supporting regulations intended to protect the ecological functions of the shoreline and prevent adverse cumulative impacts. Regulations that help ensure that impacts are avoided, minimized, and mitigated include provisions that can be separated in the following three general categories: (1) provisions that allow, condition, or prohibit specific types of development depending on Shoreline Designation; (2) provisions that apply specific standards that help avoid and minimize potential impacts; and (3) provisions that require mitigation of impacts and/or demonstration of no net loss of functions. In addition to provisions that apply standards to specific uses and modifications, the SMP requires that all shoreline modifications comply with the following general provisions (SMP Section 7.3 (A.), (B.), and (C.)):

- Structural modifications may be permitted only where they are demonstrated to be necessary to support or protect an allowed primary structure or use that is in danger of loss or damage, or are necessary for mitigation or enhancement;
- Preference is given to shoreline modifications that have a lesser impact on ecological functions; and
- Modifications shall be designed to incorporate all feasible measures to protect ecological functions and ecosystem-wide processes.

The following sections present tables which provide a brief summary of the primary potential ecological impacts that may arise from specific shoreline uses and modifications permitted under the SMP, as well as a summary of the proposed SMP regulations intended to conserve ecological functions and prevent adverse cumulative impacts. The potential impacts described in the tables account for the more significant or most likely impacts, but may not account for the full suite of potential impacts from a given use or modification. These less significant or less likely impacts, while not specifically discussed below, would be addressed during the permitting process through mitigation sequencing requirements. Also, the listing of potential impacts does not mean that these impacts would occur in every instance of a certain use or modification. Potential uses and their impacts described here should be considered along with the future land use expectations described in Chapter 4.

The tables that describe proposed SMP provisions (in whole or in part) provide an indication of how potential standards may relate to ecological functions or which function or functions the regulations help to protect. It should be noted that an “X” in the following tables indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or has a less direct effect on the function.

#### **5.4.1 Shoreline Stabilization**

Shoreline stabilization measures have potentially significant impacts on sediment transport processes and floodplain connectivity. A more complete listing of potential impacts from shoreline stabilization is provided below in Table 5-9.

Only one permit for a bulkhead was issued in the City in the past ten years, and under the proposed SMP, new or expanded shoreline stabilization measures would be expected to be permitted relatively infrequently. However, repair and replacement of existing structures would be expected to occur more commonly. Key regulations in the proposed SMP that address potential impacts from shoreline stabilization are listed below in Table 5-10. The proposed SMP

substantially limits the development of new shoreline stabilization structures by establishing strict permitting criteria. The proposed SMP further ensures that new and replacement structures evaluate and implement the stabilization approach with the least potential for impacts to shoreline functions. Finally, any new or replacement structure must ensure that no net loss of functions is achieved.

Table 5-9. Summary of potential impacts from shoreline stabilization.

<b>Functions</b>	<b>Potential Impacts to Functions</b>
<b>Hydrologic</b>	Increase in flow energy at the shoreline resulting in increased bank erosion downstream.
	Disruption of shoreline wetlands.
	Reduction in floodplain connectivity.
<b>Water Quality</b>	Water quality impacts associated with construction.
	Removal of shoreline vegetation increases erosion and water temperatures.
<b>Vegetative/Habitat</b>	Simplification of shoreline habitat complexity.

Table 5-10. Summary of key shoreline stabilization regulations that protect ecological functions.

<b>Location in SMP</b>	<b>SMP Provisions Providing Protection of Ecological Functions</b>	<b>Primary Function*</b>			
		<b>Hydrologic</b>	<b>Water Quality</b>	<b>Vegetation</b>	<b>Habitat</b>
<b>Shoreline Environment Designations (Table 7-1)</b>	New hard structural stabilization is a conditional use in all environments.	X	X	X	X
<b>Shoreline Stabilization (7.3.1)</b>	Proposals for new or modified shoreline stabilization shall demonstrate that proposed structures are the minimum size necessary. (A.)	X	X	X	X
	New lots created by subdivision shall demonstrate that new shoreline stabilization will not be necessary for the life of the development. (B.)(1.)	X		X	X
	Development on steep slopes shall be set back sufficiently to ensure that shoreline stabilization is unlikely to be necessary during the life of the structure. (B.)(2.)	X		X	X
	Development that would require new shoreline stabilization that would cause significant impacts to adjacent or down-current properties and shoreline areas shall not be allowed. (B.)(3.)	X		X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	Hard armoring solutions shall be authorized only when demonstrated to be necessary to prevent damage from erosion. (B.)(4.)	X		X	X
	Shall be designed and constructed to avoid or minimize stream channel direction modification, realignment, or straightening or to result in increased channelization of normal stream flows or impacts to sediment transport. (C.)	X			
	Shoreline stabilization, with the exception of modifications to flood control structures approved by the Corps, shall follow this hierarchy of preference: 1. No action; 2. Non-structural stabilization ; 3. Stabilization constructed of natural materials; 4. Soft-shore stabilization in combination with rigid works; 5. Rigid works. (D.)	X		X	X
	New structural shoreline stabilization measures to protect an existing primary structure are only allowed when there is conclusive evidence that the structure is in danger from erosion caused by currents or waves All new erosion control structures shall not result in a net loss of shoreline ecological functions. (E.)	X	X	X	X
	New shoreline structural stabilization may be permitted in support of a water-dependent or non-water-dependent development when the erosion is not being caused by upland conditions, there is a need to protect primary structures from damage due to erosion, non-structural measures are not significant, and the stabilization structure will not result in a net loss of ecological functions. (F.) (G.)	X	X	X	X
	New shoreline structural stabilization may be permitted to protect ecological restoration or hazardous substance remediation projects when non-structural measures are not feasible, and when the stabilization structure will not result in a net loss of shoreline ecological functions. (H.)	X	X	X	X
	The construction of shoreline protection for the purpose of creating dry land is prohibited. (I.)	X		X	X
	Replacement of an existing stabilization structure is permitted if there is a demonstrated need to protect existing primary uses or structures from erosion caused by current or wave action. (J.)	X	X	X	X
	Replacement structures shall not encroach waterward of the OHWM or existing structure unless the residence was occupied prior to 1992, and there are overriding safety or environmental concerns. In	X	X	X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	such cases, the replacement structure shall abut the existing stabilization structure. (K.)				
	Replacement must result in no net loss of ecological functions. (L.)	X	X	X	X
	Bioengineered projects shall be designed by a qualified professional and shall incorporate a variety of native plants. (N.)			X	

\*An "X" indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

### 5.4.2 Breakwaters, Jetties, Groins, and Instream Structures

Breakwaters, jetties and groins are usually intended to alter currents or to deflect or dissipate wave energy. Instream structures, including dams and water diversions, have similar impacts, except that they may also alter water levels. All such structures have the potential to cause unintended impacts on natural bank erosion, sediment transport processes, and habitat. Potential impacts from these structures are summarized below in Table 5-11.

Based on past permit trends, as well as proposed SMP standards, few, if any, new breakwaters, jetties, groins, or instream structures should be anticipated. Where new structures are permitted, they would need to demonstrate no net loss on an individual project basis. Infrequent repair and replacement of existing structures may be expected, and mitigation sequencing would apply for these structures. Key regulations in the proposed SMP that address potential impacts from breakwaters, jetties, groins, and instream structures are listed below in Table 5-12.

Table 5-11. Summary of potential impacts from breakwaters, jetties, groins, and instream structures.

Functions	Potential Impacts to Functions
Hydrologic	Potential interference with movement of sediments, altering substrate composition.
Water Quality	Reduced circulation and associated changes in water quality.
Vegetative/ Habitat	Migration barriers for aquatic species.
	Instream habitat alterations and shading.

Table 5-12. Summary of key regulations related to breakwaters, jetties, groins, and instream structures that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
<b>Shoreline Environment Designations (Table 7-1)</b>	Breakwaters, jetties, rock weirs, and groins, are a conditional use in all environments.	X			X
<b>Breakwaters, Jetties, Weirs, and Groins (7.3.2)</b>	Shall only be allowed waterward of the OHWM when necessary to support water-dependent uses, public access, shoreline stabilization, or other public purpose. (A.)	X			X
	Require a conditional use permit, except structures installed to protect or restore ecological functions. (B.)	X			X
	Open-pile or floating breakwaters shall be preferred. (C.)	X			
<b>In-Stream Structures (7.2.8)</b>	Allowed only when the proposed activity will not increase the permanent footprint of the structure, and when all areas disturbed by construction will be returned to their pre-project or improved ecological condition (B.)	X	X	X	X
	Applications shall include a hydraulic analysis prepared by a professional engineer, and a habitat management plan that describes provisions for protecting in-stream resources and measures to compensate for unavoidable impacts, prepared by a professional biologist. (C.)	X	X	X	X

\*An “X” indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

### 5.4.3 Flood Hazard Management Structures

Potential impacts from flood hazard management are summarized below in Table 5-13. The proposed SMP provisions balance maintaining flood protection with protecting ecological functions. Key regulations in the proposed SMP that address potential flood hazard management impacts are listed below in Table 5-14.

Table 5-13. Summary of potential impacts from flood hazard management structures.

Functions	Potential Impacts to Functions
Hydrologic	Restricted flood flows may increase flood velocities downstream
Water Quality	Increased instream temperatures resulting from decreased riparian vegetation.
Vegetative/ Habitat	Increased mainstem flow velocities, scouring of salmon redds, reduced off-channel refugia
	Reduced riparian vegetation
	Simplification of channel bank complexity

Table 5-14. Summary of key regulations related to flood hazard management structures that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Shoreline Environment Designations (Table 7-1)	Flood control works are a conditional use in the Urban Conservancy, Recreation, and Aquatic environments. New flood control works are prohibited in th Aquatic environment.	X	X	X	X
Flood Prevention and Flood Damage Minimization: Flood Control Works (6.4)(F.)	New or expanded structural flood control works shall be permitted for the following purposes only, as documented through a geotechnical or geofluvial analysis: a. They are necessary to protect existing development; b. Non-structural flood hazard measures are infeasible; c. Impacts to ecological processes and functions and priority fish and wildlife species and habitats can be successfully mitigated; d. Appropriate vegetation conservation actions are undertaken; and e. They are placed landward of associated wetlands and buffer areas except where				X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	no alternative exists as documented in a geotechnical analysis. (2.)				
	New or expanded dikes and levees shall, to the maximum extent feasible be: a. Limited to the minimum height required; b. Placed landward of associated wetlands and designated buffers, unless there is no other feasible alternative; c. Located and designed so as to protect and restore the natural character of the stream and provide floodway functions; d. Incorporate appropriate vegetation management. (4.)	X		X	X
	All flood protection measures shall demonstrate that downstream flooding will not be increased and the integrity of downstream ecological functions will not be adversely affected, including disruption of natural drainage flows and stormwater runoff. (5.)	X			X

\*An “X” indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

### 5.4.4 Fill and Excavation

Fill and excavation are commonly associated with development projects. Potential impacts from clearing and grading are summarized below in Table 5-15. Key regulations in the proposed SMP that address potential aquaculture impacts are listed below in Table 5-16.

Table 5-15. Summary of potential impacts from fill and excavation.

Functions	Potential Impacts to Functions
<b>Hydrologic</b>	Alteration of existing water runoff patterns due to topographical alterations.
	Alterations in the stormwater retention timing and infiltration due to the loss of vegetation.
<b>Water Quality</b>	Short-term and long-term increases in turbidity related to vegetation removal and soil disturbance.
	Reduced biofiltration of stormwater resulting from vegetation removal.
<b>Vegetative/Habitat</b>	Loss of functions due to removal or disturbance.
	Increased water temperatures due to vegetation removal.

Table 5-16. Summary of key regulations related to fill and excavation that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
<b>Shoreline Environment Designations (Table 7-1)</b>	All fill below the OHWM, except that required for ecological restoration, requires a conditional use permit.	X	X	X	X
<b>Fill and Excavation (7.3.3)</b>	Allowed below the OHWM only when demonstrated to be necessary for: habitat restoration; mitigation or enhancement; correction of adverse results of past shoreline modification; a water-dependent use; a public access proposal; cleanup of contaminated sediments; or a transportation facility of statewide significance currently located on the shoreline. (B.)	X	X	X	X
	Fill is restricted in wetlands or Fish and Wildlife Conservation Areas in accordance with Critical Areas regulations. (C.)	X	X	X	X
	Excavation of previously deposited dredge spoils above the OHWM may be permitted if the spoils site is part of a dredge materials management plan and the spoils were not originally placed as part of a beach nourishment or other shoreline restoration project. (D.)	X	X	X	X

\*An “X” indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

### 5.4.5 Dredging and Dredge Material Disposal

Dredging can have significant effects on sediment transport, short-term effects on water quality, and by creating deep water, dredging can eliminate valuable shallow-water edge habitat. Potential impacts from dredging and dredge material disposal are summarized below in Table 5-17.

Because the SMP establishes standards for new development to avoid the need for future maintenance dredging, most likely dredging applications will be related to maintenance dredging of previously dredged channels where habitat functions are already impacted. Key regulations in the proposed SMP that address potential dredging and dredge material disposal impacts are listed below in Table 5-18.

Table 5-17. Summary of potential impacts from dredging and dredge material disposal.

Functions	Potential Impacts to Functions
Hydrologic	Alteration of hydrologic and sediment processes.
Water Quality	Reduction in water quality from turbidity and in water dredge material disposal.
Vegetative/ Habitat	Disruption of benthic community and submerged aquatic vegetation.
	Reduction in shallow-water habitat.

Table 5-18. Summary of key regulations related to dredge and dredge material disposal that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Shoreline Environment Designations (Table 7-1)	Dredge disposal is a conditional use in the Residential, Urban Conservancy, Aquatic, and Recreation environments.	X	X	X	X
Dredging and Dredge Material Disposal (7.3.4)	Dredging shall be permitted only: 1. For navigation, where significant ecological impacts are minimized and mitigation is provided; 2. When part of an approved regional dredge management plan for flood control; 3. As part of an approved habitat improvement project; 4. As part of a MTCA or CERCLA project; 5. In conjunction with a bridge, navigational structure, or wastewater treatment facility for which there is a documented public need and where other feasible options do not exist. (B.)	X	X	X	X
	New development shall be sited and designed to avoid or minimize the need for new and maintenance dredging. (C.)	X	X	X	X
	Maintenance dredging of navigation channels shall be restricted to previously authorized locations, depths, and widths. (D.)	X	X	X	X
	Dredging waterward of the OHWM for the primary purpose of obtaining fill material is allowed only when necessary for restoration of ecological functions. When allowed, the site must be located waterward of the OHWM. (E.)	X	X	X	X
	Disposal of dredge material on shorelands or wetlands within a river's channel migration zone shall be discouraged, and when allowed, shall require a conditional use permit. Shall only be allowed for ecological restoration or mitigation. (G.)	X	X	X	X
	Dredge material disposal shall be permitted only where it is demonstrated by a qualified professional	X	X	X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	that the disposal will not result in significant or ongoing adverse impacts to ecological functions. When such impacts are unavoidable, they shall be minimized and mitigated such that they result in no net loss of functions. (H.)				
	Dredging and dredge disposal shall be scheduled to minimize impacts to biological productivity. (J.)				X

\*An “X” indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

### 5.4.6 Aquaculture

Potential impacts from aquaculture are summarized below in Table 5-19. The City does not have any existing aquaculture facilities, and new facilities are not anticipated. New aquaculture uses may be permitted only in association with the non-commercial restoration of native fish species in the Lewis River, and are a preferred use on City shorelines (SMP 7.2.2). If such operations are established in the future, regulations may be established by amendment to the SMP.

Table 5-19. Summary of potential impacts from aquaculture.

Functions	Potential Impacts to Functions
<b>Hydrologic</b>	Alteration in hydrologic and sediment processes associated with aquaculture structures.
<b>Water Quality</b>	Reduction in water quality from substrate modification, supplemental feeding practices, pesticides, herbicides, and antibiotic applications.
<b>Vegetative/Habitat</b>	Accidental introduction of non-native species or potential interactions between wild and artificially produced species.

### 5.4.7 Boat and Vessel Facilities, including Marinas

Boat and vessel facilities include all in-water and overwater structures for the launching and mooring of boats and vessels. Overwater structures have the potential for a variety of impacts primarily stemming from overwater shading and disturbance of sediment transport. Potential impacts from boat and vessel facilities are summarized below in Table 5-20.

The SMP generally addresses overwater structures by implementing measures to limit the proliferation of structures and through measures that avoid, minimize and mitigate effects on sediment transport, water quality, and nearshore habitat.

Within the City, docks and floats on Horseshoe Lake are the most commonly anticipated boating facilities. Because threatened, endangered, and sensitive fish species are not present in Horseshoe Lake, the most likely effect of docks on the Lake is related to water quality effects associated with short-term construction impacts and long-term effects from vegetation clearing and associated boat use. Key regulations in the proposed SMP that address potential boat and vessel facility impacts are listed below in Table 5-21.

Table 5-20. Summary of potential impacts from boat and vessel facilities.

Functions	Potential Impacts to Functions
<b>Hydrologic</b>	Potential interference with movement of sediments, altering substrate composition.
<b>Water Quality</b>	Water quality impacts associated with construction of docks and other in-water structures (e.g. spills, harmful materials use) and related uses of new docks (e.g. boat maintenance and operation).
<b>Vegetative/ Habitat</b>	Increased shading in shallow-water habitat areas resulting from dock and pier construction can limit growth of aquatic vegetation and alter habitat for and behavior of aquatic organisms, including juvenile salmon.
	Disturbance of substrate and submerged aquatic vegetation from pilings and anchors.
	Nighttime lighting effects on fish behavior.
	Loss of habitat for benthic community, less LWD for habitat complexity.

Table 5-21. Summary of key regulations related to boat and vessel facilities that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
<b>Shoreline Environment Designations (Table 7-1)</b>	Residential docks and marine railways are prohibited in the High-Intensity and Recreation environments.	X	X	X	X
	Boating facilities, including boat launches and other moorage, are prohibited in the Residential environment.	X	X	X	X
<b>Boating Facilities: General Requirements (7.2.3)(A.)</b>	Shall demonstrate that they result in no net loss of ecological functions. (1.)	X	X	X	X
	Shall locate where there is adequate water mixing and flushing; they shall not adversely affect flood channel capacity; water depths are	X	X	X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	adequate to minimize new or maintenance dredging; the structure shall minimize the obstruction of currents, alteration of sediment transport, and accumulation of drift logs and debris; new shoreline stabilization shall not be needed; and water depths are adequate to prevent grounding. (2.)				
	Shall not be located along braided or meandering river channels where the channel is subject to change in alignment, or on point bars or other accretion beaches. (3.)	X	X	X	X
	Shall be constructed of materials that will not adversely affect water quality or aquatic plants and animals over the long term. (4.)		X	X	X
	Accessory uses shall be limited to water-oriented, and shall be located outside of the buffer and floodway and as far landward as possible. (6.)	X	X	X	X
	Parking and storage areas shall be located outside of shoreline jurisdiction whenever feasible and shall be setback from the shoreline as far as feasible. (7.)	X	X	X	X
	Lighting associated with overwater structures shall be directed to avoid causing glare on waterbodies, and illumination levels shall be the minimum necessary for safety. (8.)				X
	New accessory uses should be located outside any applicable shoreline buffer unless infeasible, in which case the use must be designed and located to minimize intrusion into the buffer and must mitigate for any adverse impacts to ecological functions. (10.)	X	X	X	X
<b>Boating Facilities: Boat Launches (7.2.3)(B.)</b>	Applicant must demonstrate that the size proposed is the minimum necessary. (2.)	X			
	Non-motorized boat launches shall use gravel or other permeable material. (3.)	X	X		
<b>Boating Facilities: Covered Moorage (7.2.3)(C.)</b>	Only allowed as a necessary component of a water-dependent industrial or commercial use. Shall be designed and located to minimize adverse impacts caused by shading of water.	X		X	X
<b>Boating Facilities: Docks (7.2.3)(D.)</b>	Shall be allowed only for water-dependent uses or public access. (1.)	X		X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	Shall be permitted as accessory to single-family residences only when the applicant has demonstrated that a specific need exists. (2.)	X		X	X
<b>Boating Facilities: Residential Moorage (7.2.3)(E.)</b>	New moorage structures shall be allowed only when the lot does not have access to a shared structure and there is no entity capable of developing a shared structure. (1.)	X	X	X	X
	Prior to approving a new residential dock, an applicant shall demonstrate that a mooring buoy is not feasible. (2.)	X		X	X
	When feasible, new residential development of two or more dwellings with accessory docks shall provide joint use or community dock facilities to reduce ecological impacts of new overwater facilities. (3.)	X		X	X
	Shall meet the following standards: a. Docks shall be restricted to the minimum size necessary; b. New or expanded covered moorage is prohibited; c. Shall be constructed of materials that will not adversely affect water quality or aquatic plants and animals over the long-term; d. Floats shall not ground out on substrate; e. Pile spacing shall be the maximum feasible and shall avoid blocking water movement; f. Piling diameter shall be the minimum size possible; g. Grating or clear translucent material shall cover the entire surface of piers and ramps and floats, with 60% open space grating and greater than 90% light transmittance through translucent material. (4.)	X	X	X	X
	Private boat ramps are prohibited. (5.)				
	Moorage or launch structures shall not be allowed in critical freshwater aquatic habitats, unless demonstrated not to result in a net loss of ecological functions, (6.)	X	X	X	X

\*An "X" indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

### 5.4.8 Commercial, Industrial, and Institutional Development

Potential impacts from commercial and industrial development are summarized below in Table 5-22. Shoreline designation standards in the proposed SMP limit where and what type of commercial and industrial development may occur. These standards help avoid potential use conflicts and appropriately locate high intensity development in shoreline areas with higher levels of existing alterations.

Based on past permit data, new commercial and industrial uses are anticipated to occur infrequently in the City’s shoreline jurisdiction. Key regulations in the proposed SMP that address potential commercial and industrial development impacts are listed below in Table 5-23. Specific standards for shoreline modifications also apply to commercial and industrial development, including clearing and grading, boat and vessel facilities, dredging and dredge material disposal, among others.

Table 5-22. Summary of potential impacts from commercial and industrial development.

Functions	Potential Impacts to Functions
<b>Hydrologic</b>	Increase in stormwater runoff and discharge in association with more impervious surfaces.
	Disruption of shoreline wetlands.
<b>Water Quality</b>	Increase in contaminants associated with the creation of new impervious surfaces (e.g. metals, petroleum hydrocarbons).
	Water quality contamination from use and storage of toxic substances.
	Greater potential for increased erosion, bank instability, and turbidity associated with vegetation clearing.
<b>Vegetative/ Habitat</b>	Reduced shoreline habitat complexity, increased water temperatures, and less LWD.
	Loss of or disturbance to riparian habitat during upland development.
	Lighting effects on both fish and wildlife in nearshore areas.

Table 5-23. Summary of key regulations related to commercial and industrial development that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
<b>Shoreline Environment</b>	Water-dependent commercial development is a prohibited use in the Urban Conservancy and Recreation environments, and a conditional use in	X	X	X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
<b>Designations (Table 7-1)</b>	the Aquatic environment.				
	Water-related commercial development is a prohibited use in the Urban Conservancy, Recreation, and Aquatic environments. Water-enjoyment commercial development is a conditional use in the Aquatic environment.	X	X	X	X
	Non-water-oriented commercial development is prohibited in all environments except High-Intensity.	X	X	X	X
	Industrial development is prohibited in all environments except High-Intensity, with the exception of water-dependent industrial, which is permitted in the Aquatic environment.	X	X	X	X
	Institutional development is prohibited in all environments except High-Intensity.	X	X	X	X
<b>Commercial (7.2.4)</b>	Non-water-oriented commercial shall be permitted only as part of a mixed-use development that provides significant public benefit such as public access and ecological restoration, or when the site is physically separated from the shoreline by another property or public right-of-way. (C.)	X	X	X	X
	Water-dependent and water-related commercial uses shall consider public access and/or ecological restoration as potential mitigation for impacts to shoreline resources and values unless such improvements are demonstrated to be infeasible or inappropriate. (D.)	X	X	X	X
	An applicant for a new commercial use or development shall comply with the mitigation sequencing provisions of the SMP. (E.)	X	X	X	X
	Accessory uses shall be located outside of shoreline jurisdiction unless demonstrated to be infeasible. (F.)	X	X	X	X
	Overwater structures or other structures waterward of the OHWM are allowed only when required; design shall not interfere with normal stream geomorphic processes, or require shoreline stabilization. (G.)	X	X	X	X
	Only water-dependent elements for commercial use may encroach on required vegetated buffers. (I.)		X	X	
<b>Industrial (7.2.6)</b>	Non-water-oriented industrial shall be permitted only as part of a mixed-use development that provides significant public benefit such as public access and ecological restoration, or when the site is physically separated from the shoreline by another property or	X	X	X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	public right-of-way, or when navigability is severely limited and the development provides a significant public benefit such as public benefit and ecological restoration. (C.)				
	Industrial development and redevelopment is encouraged to located where environmental cleanup and restoration of the shoreline area can be incorporated. (D.)	X	X	X	X
	Proposals for new industrial and port developments shall demonstrate the need for expansion into an undeveloped area. (E.)	X	X	X	X
	Only water-dependent elements of proposal for industrial may encroach on required vegetated buffers. (F.)		X	X	
	Siting of accessory development within shoreline jurisdiction shall be limited to facilities required to serve approved water-oriented uses. (G.)	X	X	X	X
<b>Institutional (7.2.7)</b>	Where allowed, non-water-oriented institutional uses must provide public benefit such as public access and ecological restoration. (A., C.)	X	X	X	X
	Loading, service areas, and other accessory uses shall be located landward of a primary structure or underground. (B.)	X	X	X	X

\*An "X" indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

### 5.4.9 Agriculture and Forest Practices

In the proposed SMP, new agriculture is a prohibited use in all shoreline environment designations. There are no existing agricultural uses within the City of Woodland and agricultural uses are not consistent with the Comprehensive Plan. Forest practices are also prohibited in all shoreline environment designations. Potential impacts from agriculture and forest practices are summarized below in Table 5-24. Key regulations in the proposed SMP that address potential impacts from agriculture and forest practices are listed below in Table 5-25.

Table 5-24. Summary of potential impacts from agriculture and forest practices.

Functions	Potential Impacts to Functions
Hydrologic	Reduced infiltration associated with forestry actions resulting in flashier hydrology.
	Agricultural irrigation activities reduce summer low flows in streams.
Water Quality	Increased erosion from removal of trees or tilling of soil.
	Erosion and fine sediment from logging roads.
	Potential for contaminant and nutrient loading of surface waters from agricultural practices.
Vegetative/Habitat	Reduction in forest cover associated with forestry actions and conversion of lands to agricultural uses.

Table 5-25. Summary of key regulations related to agriculture and forest practices that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
<b>Shoreline Environment Designations (Table 7-1)</b>	Agriculture is prohibited in all environments.	X	X	X	X
	Forest practices are prohibited in all environments.	X	X	X	X
<b>Agriculture (7.2.1)</b>	New or expanded agriculture is a prohibited use activity within shoreline jurisdiction. (B.)	X	X	X	X
	Preparatory work associated with the conversion of land to non-agricultural uses and/or developments shall be consistent with the policies and regulations for the non-agricultural use and the general provisions of the SMP, including vegetation conservation. (C.)	X	X	X	X
<b>Forest Practices (7.2.5)</b>	Vegetated buffers found in Appendix B shall be maintained along shorelines. (B.)		X	X	X
	Ecology or the City shall allow only selective commercial timber cutting within shoreline jurisdiction. (C.)	X	X	X	X

\*An "X" indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

## 5.4.10 Mining

Mining is the removal of sand, soil, minerals, and other earth materials for commercial or economic use. The potential impacts of mining generally depend on the type and scale of mining activity. Potential impacts from mining are summarized below in Table 5-26. Key regulations that protect shoreline ecological functions from mining impacts are summarized below in Table 5-27.

Table 5-26. Summary of potential impacts from mining.

Functions	Potential Impacts to Functions
Hydrologic	Alteration in hydrologic and sediment processes potentially leading to erosion, channel incision, head cutting, and/or channelization of a river upstream or downstream from the mining location.
	Loss of floodplain habitat associated with armoring and levees to isolate pits from the river channel (Rivers).
Water Quality	Reduction in water quality from turbidity and dredge material disposal.
Vegetative/ Habitat	Disruption of benthic community.
	Simplification of in-channel habitats (Rivers/Streams).
	Potential to strand fish during pit capture events (Rivers).

Table 5-27. Summary of key regulations related to mining that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
<b>Shoreline Environment Designations (Table 7-1)</b>	Mining is a conditional use in the Aquatic environment and is prohibited in all other environments.	X	X	X	X
<b>Mining (7.2.9)</b>	To be approved, must demonstrate no adverse impact to the structural integrity of the shoreline that would change existing aquatic habitat or flow characteristics; and no changes in hydraulic processes to or from adjacent waterbodies that would damage aquatic habitat, shoreline habitat, or groundwater. (B.)	X	X	X	X
	Mining waterward of the ordinary high water mark may be permitted only when demonstrated that: 1. Removal of sand and gravel or other materials will not adversely affect natural gravel transport or other stream processes; 2. Proposed activities will not have significant adverse impacts on habitat for priority species and will not cause a net loss of shoreline ecological functions. (C.)	X	X	X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	After completion of mining activities: 3. Backfill materials used in site reclamation shall be natural materials; 4. Reclamation shall prevent future erosion and sedimentation; 5. Topography of the site shall not cause standing water to collect and remain on the site; 6. All exposed areas shall be revegetated with self-sustaining plants suitable to the immediate shoreline environment. (E.)	X	X	X	X

\*An "X" indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

### 5.4.11 Recreational Development

Woodland’s shorelines offer a variety of recreational opportunities, both formal and informal. The potential impacts of recreational uses generally depend on the type and intensity of the use. Active uses, which may require structural development such as boat ramps, boardwalks, and concession facilities, are expected to have a greater impact than passive uses, such as hiking trails. Potential impacts from recreational development are summarized below in Table 5-28.

Within the City of Woodland, development of Horseshoe Lake Park is planned. Key regulations in the proposed SMP that address potential impacts from recreational development are listed below in Table 5-29.

Table 5-28. Summary of potential impacts from recreational development.

Functions	Potential Impacts to Functions
<b>Hydrologic</b>	Increase in stormwater runoff and discharge in association with more impervious surfaces.
<b>Water Quality</b>	Increase in contaminants associated with the creation of new impervious surfaces (e.g. metals, petroleum hydrocarbons).
	Increase in pesticide and fertilizer use.
	Greater potential for increased erosion, bank instability, and turbidity associated with vegetation clearing.
<b>Vegetative/Habitat</b>	Reduced shoreline habitat complexity, increased water temperatures, and less LWD.
	Loss of or disturbance to riparian habitat during upland development.
	Lighting effects on both fish and wildlife in nearshore areas.

Table 5-29. Summary of key regulations related to recreational development that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
<b>Shoreline Environment Designations (Table 7-1)</b>	Water-oriented recreational development is a conditional use in Residential and Aquatic environments.	X	X	X	X
	Non-water-oriented recreational development is prohibited in the Urban Conservancy and Aquatic environments and is a conditional use in Residential and Recreation environments.	X	X	X	X
<b>Recreational (7.2.10)</b>	Only water-dependent elements may encroach on required vegetated buffers when they are demonstrated to be necessary. All encroachments shall be fully mitigated. (C.)			X	
	Design of parking areas shall ensure that surface runoff does not discharge to adjacent waters. Parking areas shall be located upland, away from the immediate shoreline. (D.)		X		
	All permanent, substantial recreational structures shall be located outside of mapped floodways. (E.)	X			X
	New overwater structures shall be allowed only when they accommodate water-dependent recreation uses; and they are not located in a critical area or buffer. (F.)	X	X	X	X

\*An “X” indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

### 5.4.12 Residential Development

Table 5-30 below describes the potential impacts of residential development. Permitting and land use trends indicate that gradual development of single family residential development is likely to occur in shoreline jurisdiction in the foreseeable future. Table 5-31 lists SMP provisions that help ensure that those impacts are avoided, minimized, or mitigated to avoid a net loss of functions. Many shoreline modifications may be considered accessory to residential development; however, such modifications are not addressed in this subsection, but are addressed in other subsections of this document (e.g. shoreline stabilization).

Table 5-30. Summary of potential impacts from residential development.

Functions	Potential Impacts to Functions
<b>Hydrologic</b>	Increase in stormwater runoff and discharge in association with more impervious surfaces.
<b>Water Quality</b>	Increase in contaminants (e.g. metals, petroleum hydrocarbons) and decrease in infiltration potential associated with the use and creation of new impervious surfaces.
	Water quality contamination from failed septic systems.
	Increase in pesticide and fertilizer use.
	Greater potential for increased erosion, bank instability, and turbidity associated with vegetation clearing.
<b>Vegetative/Habitat</b>	Reduced shoreline habitat complexity, increased water temperatures, and less LWD.
	Loss or disturbance of riparian habitat during upland development.

Table 5-31. Summary of key regulations related to residential development that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
<b>Shoreline Environment Designations (Table 7-1)</b>	Single-family residential development is prohibited in the Aquatic environment.	X	X	X	X
	Multi-family residential development is prohibited in the Urban Conservancy, Recreation, and Aquatic Environments.	X	X	X	X
	New floating residences are prohibited in all environments.	X	X	X	
<b>Residential (7.2.11)</b>	New residential development shall comply with the		X	X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	shoreline buffer provisions established in Appendix B. (B.)				
	New residential development, including subdivisions, short-plats, accessory uses, and structures shall be designed such that no shoreline stabilization is necessary; shall be prohibited in or floating over water; and shall be prohibited in floodways and channel migration zones. (D.)	X	X	X	X
	New residential lots shall be configured such that structural flood hazard reduction and shoreline stabilization measures are not now and will not be required during the life of the development. (E.)	X		X	X
	New residential lots shall be configured such that siting and construction are feasible while achieving no net loss of ecological functions. (F.)	X	X	X	X

\*An “X” indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

### 5.4.13 Transportation Facilities, including Parking

Transportation facilities, including local roads and the airport are common features along the City of Woodland’s shorelines. Transportation facilities and associated traffic tend to impair habitat and hydrologic connectivity, and stormwater runoff can have a substantial impact on water quality. Potential impacts from transportation facilities are summarized below in Table 5-32.

Permit trends within the City indicate that activities relating to the maintenance of transportation infrastructure occur relatively frequently in shoreline jurisdiction. Key regulations in the proposed SMP that address potential impacts from transportation facilities are listed below in Table 5-33.

Table 5-32. Summary of potential impacts from transportation facilities, including parking.

Functions	Potential Impacts to Functions
Hydrologic	Increase in stormwater runoff and discharge in association with more impervious surfaces.
Water Quality	Increase in contaminants associated with the creation of new impervious surfaces (e.g. metals, petroleum hydrocarbons).
Vegetative/	Greater potential for increased erosion, bank instability, and turbidity associated

Functions	Potential Impacts to Functions
Habitat	with vegetation clearing.
	Fish passage impacts associated with stream crossings.

Table 5-33. Summary of key regulations related to transportation facilities, including parking, that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
<b>Shoreline Environment Designations (Table 7-1)</b>	With the exception of bridges, transportation uses are prohibited or a conditional use in the Aquatic environment.	X	X	X	X
<b>Transportation and Parking: Roads,Railroads and Bridges (7.2.12)(A.)</b>	New or expanded surface transportation facilities not related to and necessary for the support of shoreline activities shall be located outside of the shoreline jurisdiction wherever possible unless location outside of shoreline jurisdiction is demonstrated to be infeasible. (1.)	X	X	X	X
	Applicant shall demonstrate that facilities are designed to minimize impacts to critical areas and associated buffers; minimize alterations to natural or existing topography; and avoid or minimize the need for shoreline stabilization. (2.)	X	X	X	X
	New transportation crossings over streams shall be avoided, but where necessary shall utilize bridges rather than culverts. (3.)	X			
	All excavation materials and soils exposed to erosion shall be stabilized and protected by seeding, mulching, or other effective means. (5.)		X	X	
	Private access roads or driveways providing ingress and egress for individual single-family residences or lots shall be limited to the minimum width allowed by the fire code. (6.)	X	X	X	X
	Bridges shall provide the maximum length of clear spans feasible with pier supports to produce the minimum amount of deflection feasible, (7.)	X			
<b>Transportation and</b>	Shall be located outside of critical areas	X	X	X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
<b>Parking: Non-motorized Facilities (7.2.12)(B.)</b>	and their associated buffers, or if demonstrated unfeasible, in the outer 25 percent of the critical area buffer. Narrow, soft-surface trails outside of critical area buffers that minimize removal of vegetation and avoid important wildlife habitat and result in no net loss are an exception. (2.)				
	Elevated walkways shall be utilized where feasible to cross wetlands and streams if a trail is not feasible outside of the critical area and associated buffer. (3.)	X		X	X
<b>Transportation and Parking: Parking (7.2.12)</b>	Parking facilities allowed only as necessary to support an authorized use. Shall be located outside shoreline jurisdiction where possible. Parking in shoreline jurisdiction shall be located outside of Critical Area buffers; set as far back as possible from the OHWM; and located on the landward side of the proposed development or use. (C.)	X	X	X	X
<b>Transportation and Parking: Lighting (7.2.12)</b>	Lighting must be directed away from critical areas unless necessary for public health and safety. (D.)	X		X	X

\*An “X” indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

### 5.4.14 Utilities

Potential impacts from utility infrastructure are summarized below in Table 5-34. Key regulations in the proposed SMP that address potential utility infrastructure impacts are listed below in Table 5-35.

Table 5-34. Summary of potential impacts from utilities.

Functions	Potential Impacts to Functions
<b>Hydrologic</b>	Where utilities require shoreline armoring, associated hydrologic impacts are likely.
	Erosion at stormwater outfall locations can alter sediment transport processes.
<b>Water Quality</b>	Potential for contaminant spill or leakage.
	Water quality impacts from waste and stormwater outfalls.
<b>Vegetative/Habitat</b>	Greater potential for increased erosion, bank instability, and turbidity associated with vegetation clearing.

Table 5-35. Summary of key utility regulations that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
<b>Shoreline Environment Designations (Table 7-1)</b>	Utilities are a conditional use in the Aquatic environment.	X	X	X	X
<b>Utilities (7.2.13)</b>	New or expanded utilities may be located within shoreline jurisdiction only if no alternative location is feasible. (A.)	X	X	X	X
	Where overhead electrical transmission lines must parallel the shoreline, they shall be outside of shoreline jurisdiction. (C.)	X	X	X	X
	Transmission, distribution, and conveyance facilities shall be located in existing rights of way and corridors whenever feasible. (D.)	X	X	X	X
	Utility crossings of waterbodies shall be attached to bridges where feasible. Where attachment is not feasible, underground construction methods that avoid surface disturbance are preferred. Crossings shall be designed to cross shoreline jurisdictional areas by the shortest, most direct route feasible, unless such route would cause significant environmental damage. (E.)	X	X	X	X
	All underwater pipelines transporting liquids intrinsically harmful to aquatic life or potentially harmful to water quality shall be equipped with automatic shut-off valves on both sides of the waterbody crossing. (F.)		X		X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	Stormwater outfalls may be placed below OHWM to reduce scouring. New outfalls and modifications to existing outfalls shall be designed and constructed to avoid impacts to existing native aquatic vegetation attached to or rooted in substrate. (H.)	X	X	X	X

\*An “X” indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

### 5.4.15 Shoreline Habitat and Ecological Enhancement Projects

Potential impacts from shoreline habitat and ecological enhancement projects are primarily related to construction, and would therefore be expected to be temporary. Potential impacts from such projects are summarized below in Table 5-36. Regulations in the proposed SMP are intended to minimize these impacts while ensuring that projects maximize benefits to shoreline ecological functions and are successful in the long-term. Key regulations that address potential impacts from shoreline habitat and ecological enhancement projects are summarized below in Table 5-37.

Table 5-36. Summary of potential impacts from shoreline habitat and ecological enhancement projects.

Functions	Potential Impacts to Functions
Hydrologic	Temporary changes to stream flow due to construction activities.
Water Quality	Short-term increases in turbidity related to construction activities.
Vegetative/ Habitat	Temporary loss of functions due to removal or disturbance.

Table 5-37. Summary of key regulations related to shoreline habitat and ecological enhancement projects that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Shoreline Habitat and	Long-term maintenance and monitoring shall	X	X	X	X

<b>Ecological Enhancement Projects (7.3.6)</b>	be included in restoration or enhancement projects. (A.)				
	Shall be designed using scientific and technical information and implemented using best management practices. (B.)	X	X	X	X
	Shall demonstrate that there will be a specific ecological improvement, and that: 1. Spawning, nesting, or breeding fish and wildlife habitat conservation areas will not be adversely affected; 2. Water quality will not be degraded; 3. Flood storage capacity will not be degraded; 4. Streamflow will not be reduced; and 5. Impacts to critical areas and buffers will be avoided, minimized, or mitigated in accordance with the mitigation sequencing provisions of the SMP. (C.)	X	X	X	X

\*An “X” indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or, more likely, that the provision has a secondary or indirect effect on the function.

## 5.5 Shoreline Restoration Plan

As discussed above, one of the key objectives that the SMP must address is “no net loss of ecological shoreline functions necessary to sustain shoreline natural resources” (Ecology 2011). Although the implementation of restoration actions to restore historic functions is not required by SMP provisions, the guidelines state that “master programs shall include goals, policies and actions for restoration of impaired shoreline ecological functions. These master program provisions should be designed to achieve overall improvements in shoreline ecological functions over time, when compared to the status upon adoption of the master program” (WAC 173-26-201(2)(f)). Pursuant to that direction, the City prepared the Shoreline Restoration Plan, which identifies opportunities for voluntary restoration, enhancement, and protection actions. The Shoreline Restoration Plan also includes mandated dam mitigation, that will improve shoreline functions over the current baseline condition.

The Restoration Plan represents a long-term vision for restoration that will be implemented over time, resulting in a gradual improvement over the existing conditions. Although the SMP is intended to achieve no net loss of ecosystem functions through regulatory standards, practically, despite required practices to follow mitigation sequencing to avoid, minimize, and compensate for impacts on a site-specific scale, an incremental loss of shoreline functions may still occur at a cumulative level. These losses may occur through minor, exempt development, illegal development, failed mitigation efforts, or a temporal lag between the loss of existing functions and the realization of mitigated functions. The Restoration Plan, and the voluntary actions described therein, can be an important

component in making up that difference in ecological function that would otherwise result.

The Shoreline Restoration Plan (TWC 2015) identifies planned, site-specific, restoration projects, as well as ongoing and potential outreach and incentive programs to improve shoreline functions and processes within the City of Woodland. The Shoreline Restoration Plan also identifies several agencies and non-profit organizations are active in restoration. Major Shoreline Restoration Plan components that will contribute to an improvement in ecological functions are summarized below:

- Site specific projects to restore ecological processes and eliminate barriers. include:
  - Protecting and restoring vegetation in the designated floodway (one project);
  - Planting shoreline vegetation at Horseshoe Lake Park (one project);
  - Removing invasive vegetation and replanting with native vegetation south of the CC Street Bridge (one project).
- Using programmatic approaches and teaming with key partners in education and outreach, as well as project implementation.
- Identifying funding sources to implement projects.

## 6 EFFECTS OF OTHER PROGRAMS

---

As mentioned in the Introduction, the Guidelines (in WAC 173-26-186(8)(d)) direct that an analysis of cumulative impacts should consider “beneficial effects of any established regulatory programs under other local, state, and federal laws.” In accordance with this guidance, this section briefly discusses regulatory and other programs besides the SMP that may have beneficial effects on shoreline ecological functions.

### 6.1 Local Agencies/Regulations

#### 6.1.1 City of Woodland Zoning Code

Title 17 of the Woodland Municipal Code is the City’s zoning code. The zoning code establishes zoning districts, and, for each district, sets forth regulations addressing land use considerations such as permissible uses, the height and bulk of buildings, the areas of yard and other open spaces about buildings, and

densities. The zoning code is a key determinant of the City's physical form, including within shoreline jurisdiction.

### **6.1.2 City of Woodland Stormwater Management Code**

The City recently comprehensively updated its stormwater management code. The updated code is located in Chapter 15.12 of the Woodland Municipal Code (WMC). As enunciated in WMC 15.12.020, the purposes of this chapter include several with potentially beneficial effects on the shoreline. These purposes include:

- "Prevent surface and ground water quality degradation and prevent erosion and sedimentation of creeks, streams, ponds, lakes, wetlands, and other water bodies"
- "Protect the quality of waters for drinking water supply, contact recreation, fishing and other beneficial uses"
- "Establish sound developmental policies that protect and preserve the city's water resources"
- "Maintain existing ground water levels, instream flows, and available water supply volumes"
- "Further the goals of no net change in the quantity of runoff entering streams and no net negative change in the quality of runoff entering streams through the implementation of best management practices"

### **6.1.3 City of Woodland Erosion Control Ordinance**

Chapter 15.10 of the Woodland Municipal Code is the Erosion Control Ordinance. A purpose of the ordinance is "to help minimize or control water quality degradation." The ordinance applies to all land disturbing activities (unless exempt) within the City.

### **6.1.4 City of Woodland Comprehensive Flood Hazard Management Plan**

In 2000, the City developed the Comprehensive Flood Hazard and Drainage Management Plan. The primary focus of the plan was to reduce flood hazards, improve water quality and the preservation and enhancement of valuable environmental resources such as wetlands, riparian corridors, and fish habitat. The plan recommended a comprehensive flood hazard and drainage management program that relies on a combination of non-structural measures (education, regulations, operation and maintenance) and capital projects.

## **6.2 State Agencies/Regulations**

Aside from the Shoreline Management Act, State programs most pertinent to development in the City's shorelines include the State Hydraulic Code, the Growth Management Act, the State Environmental Policy Act, the Water Resources Act, and the Salmon Recovery Act. A variety of agencies (e.g., Washington Department of Ecology, Washington Department of Fish and Wildlife, Washington Department of Natural Resources) are involved in implementing these regulations. Washington Department of Ecology reviews all shoreline projects that require a shoreline permit, but has specific regulatory authority over Shoreline Conditional Use Permits and Shoreline Variances. Other agency reviews of shoreline developments are typically triggered by in- or over-water work, discharges of fill or pollutants into the water, or substantial land clearing.

Depending on the nature of the proposed development, State regulations can play an important role in the design and implementation of a shoreline project, ensuring that impacts to shoreline functions and values are avoided, minimized, and/or mitigated. A summary of some of the key State regulations and/or State agency responsibilities follows.

### **6.2.1 Washington Department of Natural Resources**

The Washington Department of Natural Resources (WDNR) is charged with protecting and managing the use of State-owned aquatic lands. Toward that end, uses waterward of the ordinary high water mark require review to establish whether the project will be situated on State-owned aquatic lands. If so, the project may be required to obtain an Aquatic Use Authorization from WDNR and enter into a lease agreement. Certain project activities on State-owned aquatic lands, such as single-family or two-party joint-use residential piers, are exempt from these requirements. WDNR recommends that all proponents of a project waterward of the ordinary high water mark contact WDNR to determine jurisdiction and requirements.

### **6.2.2 Washington Department of Ecology**

The Washington Department of Ecology (Ecology) may review and condition a variety of project types, including any project that needs a permit from the U.S. Army Corps of Engineers (see Section 6.3), any project that requires a Shoreline Conditional Use Permit or Shoreline Variance, or any project that disturbs more than 1 acre of land. Project types that may trigger Ecology involvement include pier and shoreline modification proposals and wetland or stream modification proposals, among others. Ecology's three primary goals are to: 1) prevent pollution, 2) clean up pollution, and 3) support sustainable communities and natural resources (<http://www.ecy.wa.gov/about.html>). Their authority comes

from the State Shoreline Management Act, Section 401 of the Federal Clean Water Act, the Water Pollution Control Act, the Federal Coastal Zone Management Act of 1972, the State Environmental Policy Act, the Growth Management Act, and various RCWs and WACs of the State of Washington.

Section 303(d) of the Clean Water Act requires the state to develop a list of waters that do not meet water quality standards. A Total Maximum Daily Load, or TMDL, must be developed for impaired waters. No 303(d) waters are currently designated within the City.

Also as a component of the Clean Water Act, in Washington State, the Department of Ecology has been delegated the responsibility by the U.S. Environmental Protection Agency for managing implementation of the NPDES program.

### **6.2.3 Washington Department of Fish and Wildlife**

Chapter 77.55 RCW (the Hydraulic Code) gives the Washington Department of Fish and Wildlife (WDFW) the authority to review, condition, and approve or deny “any construction activity that will use, divert, obstruct, or change the bed or flow of State waters.” Practically speaking, these activities include, but are not limited to, installation or modification of piers, shoreline stabilization measures, culverts, bridges and footbridges. These types of projects must obtain a Hydraulic Project Approval from WDFW, which will contain conditions intended to prevent damage to fish and other aquatic life, and their habitats. In some cases, the project may be denied if significant impacts would occur that could not be adequately mitigated.

## **6.3 Federal Agencies/Regulations**

Federal regulations most pertinent to development in the City’s shorelines include the Endangered Species Act, the Clean Water Act, and the Rivers and Harbors Appropriation Act. Other relevant federal laws include the National Environmental Policy Act, Anadromous Fish Conservation Act, Clean Air Act, and the Migratory Bird Treaty Act. A variety of agencies (e.g., U.S. Army Corps of Engineers [Corps], National Marine Fisheries Service, U.S. Fish and Wildlife Service) are involved in implementing these regulations, but review by these agencies of shoreline development in most cases would be triggered by in- or over-water work, or discharges of fill or pollutants into the water. Depending on the nature of the proposed development, federal regulations can play an important role in the design and implementation of a shoreline project, ensuring that impacts to shoreline functions and values are avoided, minimized, and/or mitigated. A summary of some of the key federal regulations and/or agency responsibilities follows.

### **6.3.1 Clean Water Act, Section 404**

Section 404 of the federal Clean Water Act provides the Corps, under the oversight of the U.S. Environmental Protection Agency, with authority to regulate “discharge of dredged or fill material into waters of the United States, including wetlands” ([http://www.epa.gov/owow/wetlands/pdf/reg\\_authority\\_pr.pdf](http://www.epa.gov/owow/wetlands/pdf/reg_authority_pr.pdf)). The extent of the Corps’ authority and the definition of fill have been the subject of considerable legal activity. However, it generally means that the Corps must review and approve many activities in shoreline waterbodies, and other streams and wetlands. These activities may include wetland fills, stream and wetland restoration, and culvert installation or replacement, among others. Similar to Washington State Environmental Policy Act (SEPA) requirements, the Corps is interested in avoidance, minimization, restoration, and compensation of impacts.

### **6.3.2 Rivers and Harbors Act, Section 10**

Section 10 of the federal Rivers and Harbors Appropriation Act of 1899 provides the Corps with authority to regulate activities that may affect navigation of “navigable” waters. Proposals to construct new or modify existing in-water structures (including piers, marinas, bulkheads, breakwaters), to excavate or fill, or to “alter or modify the course, location, condition, or capacity of” these navigable waterbodies must be reviewed and approved by the Corps.

### **6.3.3 Federal Endangered Species Act (ESA)**

Section 9 of the ESA prohibits “take” of listed species. Take has been defined in Section 3 as to “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” Per Section 7 of the ESA, the Corps must consult with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service on any projects that fall within Corps jurisdiction (e.g., Section 404 or Section 10 permits) that could affect species listed under the Federal Endangered Species Act. These agencies ensure that the project includes impact minimization and compensation measures for protection of listed species and their habitats.

## **7 SUMMARY POTENTIAL FOR CUMULATIVE IMPACTS**

---

As discussed previously, WAC 173-26-186(8)(d) directs local SMPs to evaluate and consider cumulative impacts of “reasonably foreseeable future development on shoreline ecological functions.” The most commonly anticipated changes in

shoreline development involve residential, recreation, and commercial development, as well as maintenance of transportation infrastructure and shoreline stabilization. Impacts from these activities are expected to primarily result from upland development. As directed by the WAC, the policies and regulations in the proposed SMP are designed to ensure that cumulative impacts do not result in a net loss of ecological functions.

Although future development may include other less common types of development, the location, timing, and impacts of less common uses and development projects are less predictable. WAC 173-26-201(3(d)(iii) states:

*For those projects and uses with unanticipatable or uncommon impacts that cannot be reasonably identified at the time of master program development, the master program policies and regulations should use the permitting or conditional use permitting processes to ensure that all impacts are addressed and that there is not net loss of ecological function of the shoreline after mitigation.*

In addition to regulations that avoid, minimize, and mitigate for potential impacts from less common uses and modifications, the proposed SMP includes specific regulations that require these types of developments to demonstrate on an individual basis that proposed projects will not result in a loss of ecological functions. Because these developments will be required to demonstrate no net loss on an individual basis, these types of projects will generally not be addressed in great detail in this cumulative impacts analysis.

As described in Section 5, vegetation conservation standards and critical areas standards help to ensure that commonly anticipated residential, recreational, and commercial uses will occur in such a way as to result in no net loss of ecosystem functions. New and replacement shoreline modifications that may be associated with residential development, including shoreline stabilization and docks, may also occur in shoreline jurisdiction, based on existing development patterns, their occurrence is expected to be limited. Standards in the SMP to avoid, minimize, and mitigate for potential effects of shoreline stabilization and docks will ensure no net loss of ecological functions.

## 8 NET EFFECT ON ECOLOGICAL FUNCTION

---

The proposed SMP is expected to maintain existing shoreline functions within the City of Woodland while accommodating the reasonably foreseeable future

shoreline development. Other local, state and federal regulations, acting in concert with this SMP, will provide further assurances of maintaining shoreline ecological functions over time. The Shoreline Restoration Plan, and voluntary actions described therein, will help ensure that incremental losses that could occur despite SMP provisions do not result in a net loss of functions, and these restoration actions may result in a gradual improvement in shoreline functions.

As discussed above, major elements of the SMP that ensure no net loss of ecological functions fall into the following general categories: 1) shoreline environment designations (SMP section 5), 2) general policies and regulations (SMP sections 5.4 and 6), and 3) shoreline use and modification provisions (SMP section 7). The Shoreline Restoration Plan identifies ongoing and planned voluntary restoration that will provide an opportunity to improve shoreline conditions over time.

Shoreline Environment Designations: The Shoreline Analysis Report and existing zoning and comprehensive plan designations provided the information necessary to assign shoreline environment designations by segment to each of the shoreline waterbodies.

General provisions: General standards in the SMP include regulations that provide the basis for achieving no net loss of shoreline functions, such as mitigation sequencing, water quality standards, vegetation conservation standards, and critical areas regulations in shoreline jurisdiction.

Critical area regulations ensure that vegetated buffers are retained on wetlands, fish and wildlife habitat areas (including all shorelines), and geological hazard areas. The City's flood hazard regulations require that flood capacity and natural hydrologic functions are maintained, and that where feasible, buildings are located outside of the floodway. Combined these regulations help ensure that the most sensitive areas of the City's shorelines are protected.

Shoreline use and modification provisions: Shoreline uses were individually determined to be either permitted (as substantial developments or conditional uses) or prohibited in each shoreline environment designation. The most uses are allowed in areas with the highest level of existing disturbance.

Shoreline modification regulations emphasize minimization of size of structures, and use of designs that do not degrade and may even enhance shoreline functions. Use regulations prohibit uses that are incompatible with the existing land use and ecological conditions, and emphasize appropriate location and design of the various uses.

Shoreline Restoration Plan: The Shoreline Restoration Plan identifies a number of project-specific opportunities for restoration and also identifies ongoing programs and activities, restoration partners, and recommended actions consistent with a variety of watershed-level efforts.

Given the above provisions of the SMP, including the key features listed above, implementation of the proposed SMP is anticipated to achieve **no net loss of ecological functions in the shorelines of the City of Woodland**. Voluntary actions identified and prioritized in the Shoreline Restoration Plan will provide the opportunity to enhance and restore shoreline functions over time.

## 9 REFERENCES

---

Ecology. 2005. 2005 Stormwater Manual for Western Washington.

The Watershed Company and Parametrix. 2014. Shoreline Analysis Report for the Shorelines of Cowlitz County and the Cities of Castle Rock, Kalama, Kelso, and Woodland. Prepared for the Cowlitz-Wahkiakum Council of Governments.

The Watershed Company. 2015. Shoreline Restoration Plan for Shorelines in Cowlitz County and the Cities of Castle Rock, Kalama, Kelso, and Woodland. Prepared for Cowlitz County and the Cities of Hamilton and Lyman.

Washington Department of Ecology. 2011. Shoreline Master Program Guidelines. Chapter 173-26 WAC, Part III.



---