



Shoreline Analysis Report for Shorelines in the City of South Bend

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SHORELINE ANALYSIS REPORT

for Shorelines in the City of South Bend

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READER'S GUIDE

The main purpose of this report is to provide information about shorelines in South Bend.

As the City works to update its Shoreline Master Program, the broad-scale overview of shoreline conditions provided in this report should help the City to make decisions about how to manage its shorelines in the years to come. This report should help provide the City with answers to questions such as:

- What kind of land use do we have along shorelines? What kind of land use might we have in the future?
- Where can City residents and visitors access shorelines? Are more locations for public access needed?
- What issues threaten the environmental quality of our shorelines? What actions can be taken to protect and improve their environmental quality?

It is also important to mention what this report is not intended to do. This report is not intended to provide an assessment of shoreline conditions on specific properties. This report is also not intended to be used in the future to generate numerical figures of shoreline improvements or losses.

This report is organized as follows:

- **Chapter 1** provides more detail about the purpose of this report and discusses the basics of how the City manages its shorelines under the Shoreline Management Act
- **Chapter 2** reviews what laws and agencies are particularly important in shoreline areas
- **Chapter 3** steps back and takes a big-picture look at City shorelines
- **Chapters 4, 5, and 6** zoom in and take a more detailed look at the City's shorelines, including both ecological conditions (Chapter 5) and land use conditions (Chapter 6)
- **Chapter 7** makes recommendations for shoreline management based on the contents of the previous chapters

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SHORELINE ANALYSIS REPORT

FOR SHORELINES IN THE CITY OF SOUTH BEND

1 INTRODUCTION

1.1 Background and Purpose

The City of South Bend (South Bend or City) is located in Pacific County (County), Washington State (State). The City obtained a grant from the Washington State Department of Ecology (Ecology) in 2013 to complete a comprehensive update of its Shoreline Master Program (SMP). One of the first steps of the SMP update process is to inventory and characterize the City's "Shorelines of the State" as defined by Washington's Shoreline Management Act (SMA) (Revised Code of Washington [RCW] 90.58). This Shoreline Analysis Report describes existing conditions and characterizes ecological functions in the South Bend's Shoreline of the State.

This review of existing conditions will serve as the baseline against which the impacts of future development in shoreline jurisdiction will be assessed. The SMP Guidelines (Guidelines) (Washington Administrative Code [WAC] 173-26) require that the City demonstrate that implementation of the updated SMP will result in "no net loss" of shoreline ecological functions relative to the baseline conditions.

This shoreline analysis was conducted in accordance with the Guidelines and the SMP update Scope of Work promulgated by Ecology. Under the Guidelines, the City must identify and assemble the most current, applicable, accurate and complete scientific and technical information available.

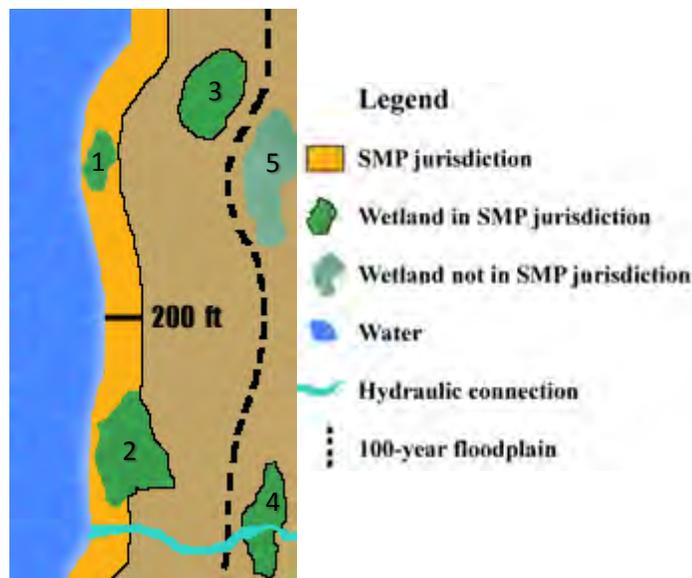
1.2 Shoreline Jurisdiction

As defined by the SMA, Shorelines of the State include certain waters of the State plus their associated "shorelands." At a minimum, the waters designated as Shorelines of the State are streams whose mean annual flow is 20 cubic feet per second (cfs) or greater, lakes whose area is greater than 20 acres (ac), and all marine waters. Shorelands are defined as:

"those lands extending landward for 200 feet in all directions as measured on a horizontal plane from the ordinary high water mark; floodways and contiguous floodplain areas landward 200 feet from such floodways; and all wetlands and river

deltas associated with the streams, lakes, and tidal waters which are subject to the provisions of this chapter...Any county or city may determine that portion of a one-hundred-year-floodplain to be included in its master program as long as such portion includes, as a minimum, the floodway and the adjacent land extending landward two hundred feet therefrom... Any city or county may also include in its master program land necessary for buffers for critical areas (RCW 90.58.030)."

Figure 1-1 provides a diagram conveying a hypothetical example of shoreline jurisdiction.



1. Shoreline-associated wetland located entirely within 200 feet from the OHWM
2. Shoreline-associated wetland located partially within 200 feet from the OHWM
3. Shoreline-associated wetland located beyond 200 feet from the OHWM, but within the 100-year floodplain
4. Shoreline-associated wetland that is beyond 200 feet from the OHWM and outside of the 100-year floodplain, but that is hydrologically connected to a shoreline waterbody
5. Wetland that is not considered part of shoreline jurisdiction because it is beyond 200 feet from the OHWM, outside of the 100-year floodplain, and not hydrologically connected to a shoreline waterbody

Figure 1-1. Hypothetical diagram showing areas within shoreline jurisdiction.
(Source: Ecology)

The ordinary high water mark (OHWM) is:

“that mark that will be found by examining the bed and banks and ascertaining where the presence and action of waters are so common and usual, and so long continued in all ordinary years, as to mark upon the soil a character distinct from

that of the abutting upland, in respect to vegetation as that condition exists on June 1, 1971, as it may naturally change thereafter, or as it may change thereafter in accordance with permits issued by a local government or the department:
PROVIDED, That in any area where the ordinary high water mark cannot be found, the ordinary high water mark adjoining salt water shall be the line of mean higher high tide and the ordinary high water mark adjoining fresh water shall be the line of mean high water” (RCW 90.58.030(2)(c)).

In South Bend, the following waters qualify as Shorelines of the State.

- Willapa River (including tidal waters associated with Potter Slough and Mailboat Slough)
- Skidmore Slough

A detailed description of the methods used to depict shoreline jurisdiction is included in Appendix A.

Of further note, the SMA sets specific preferences for uses and calls for a higher level of effort in implementing its objectives along designated Shorelines of Statewide Significance. All rivers that have mean annual flow of 1,000 cfs or greater are considered Shorelines of Statewide Significance, along with their associated uplands. Within the City, the Willapa River meets the definition of a Shoreline of Statewide Significance.

1.3 Study Area

The study area for this report includes all lands and waters within the City’s proposed shoreline jurisdiction. The City’s shoreline jurisdiction includes approximately 192 acres over approximately 7.3 miles. Further, the study area includes relevant discussion of the contributing watersheds.

According to the Washington State Office of Financial Management’s most recent population estimate, South Bend’s population in 2013 was 1,630. A portion of South Bend’s eastern border is shared with the City of Raymond. The City of Raymond is also currently in the process of updating its SMP.

2 SUMMARY OF CURRENT REGULATORY FRAMEWORK

A variety of local, State, and federal laws make up the regulatory framework that applies to the lands and waters within South Bend’s shoreline jurisdiction. This chapter provides a brief overview of key components of the regulatory framework.

2.1 Shoreline Management Act

The Shoreline Management Act of 1971 promoted planning along shorelines and coordination among governments. The legislative findings and policy intent of the SMA states:

“There is, therefore, a clear and urgent demand for a planned, rational, and concerted effort, jointly performed by federal, State, and local governments, to prevent the inherent harm in an uncoordinated and piecemeal development of the State's shorelines.” (RCW 90.58.020)

While protecting shoreline resources by regulating development, the SMA is intended to provide balance by encouraging water-oriented uses. SMPs must comply with the Guidelines, but are tailored to the specific conditions and needs of the local community.

2.2 City of South Bend Regulatory Framework

2.2.1 Existing SMP

According to Ecology records, the City adopted its original SMP on May 2, 1975. The SMP has not been amended since that time. The City code currently references Pacific County’s SMP, as amended.

2.2.2 Comprehensive Plan

After passage of the Growth Management Act in 1990, Pacific County elected to undergo a comprehensive planning process. Under this initiative, incorporated cities in the County, including South Bend, prepared comprehensive plans. The City’s original comprehensive plan was adopted in 1997. A comprehensive plan update process began in 2013. As of October 2014, a draft for comment had been provided to the public.

The Draft Plan is governed by the State's 13 broad planning goals as well as a set of County-wide policies shared by South Bend, Raymond, Long Beach, and Ilwaco. The Draft Plan contains land use, housing, public facilities and services, utilities, and transportation elements:

Land use: Future land use patterns in South Bend will reflect its historical development pattern, which demonstrates small town character with residential uses along the shoreline and agricultural, government, professional, and manufacturing uses located in the city's inland areas.

Housing: South Bend's housing element aims to ensure that South Bend citizens live in safe and affordable housing by providing a framework for local government, nonprofit organizations, and the private sector to work towards achieving access to high quality and diverse housing.

Public Facilities and Services: The public facilities and services element provides South Bend with a plan for ensuring orderly and efficient development during the plan's 20-year long-term planning term. Policies provide forecasting for public service needs, and this forecasting contributes to capital facilities planning. Public facilities and services addressed in the plan include water utilities, sewer utilities, stormwater systems, and parks facilities.

Utilities: This element of South Bend's plan addresses utilities, as provided by special use districts and private providers. Specifically, it creates a framework for how electricity, telephone, radio, and cable will be provided as growth occurs.

Transportation: The City's transportation element addresses the circulation system in South Bend, including roadways, waterways, and non-motorized routes that meet both local and regional needs.

Additional plan priorities include engaging citizens, protecting private property rights, inter-jurisdictional planning, and monitoring and amendment of the Comprehensive Plan.

The Draft Plan recognizes a need to integrate the SMP, especially in the parcels located between the shoreline and Robert Bush Drive (Highway 101), while ensuring the shoreline remains an important cultural, economic development, and environmental asset to the Downtown District. The City's land use goals and policies related to shorelines include the following:

- **GOAL 3:** Foster economic development for South Bend by establishing a Downtown and Commercial District that supports the economic vitality of its citizens and serves as the focal point of the City of South Bend.

- **Policy 3.4:** The waterfront between Highway 101 and the Willapa River remains an important cultural, economic development, and environmental asset within the Downtown District. The South Bend Shoreline Master Program provides development requirements within those areas falling under the jurisdiction of the Shoreline Management Act.
- **GOAL 7:** Ensure that future development is compatible with critical areas.
 - **Policy 7.12:** The Comprehensive Plan incorporates by reference the goals and policies of the City of South Bend Shoreline Master Program, passed by the City Council.
 - **Policy 7.13:** The city will prepare and adopt a Shoreline Master Program for South Bend in accordance with Chapter 173-26 of the Washington Administrative Code and the schedule set by the Washington State Legislature.

The Future Land Use Map in the comprehensive plan dedicates the northern shore, and the western portion of the southern shore as an Environmental Protection District, and concentrates the commercial uses along the shoreline, with residential uses generally covering the remaining land. The future land uses within shoreline jurisdiction of the Willapa River will generally be in the Commercial or Environmental Protection District zones, while the future land uses within shoreline jurisdiction of Skidmore Slough will be mainly residential.

2.2.3 Zoning Ordinance

The Zoning Ordinance of the City of South Bend determines the size, use, location, density, and character of development within the City. It is the method by which planning policy is carried out, and it is meant to be consistent with those goals and policies of South Bend's Comprehensive Plan related to zoning, critical areas, and land division. The code was originally adopted in 1974 and regulates the following districts: Restricted Residential, General Residential, Commercial Use, Neighborhood Commercial, Industrial Use, and Shoreline Management Combining.

2.2.4 Critical Areas Ordinance

Per Growth Management Act requirements, the City is required to designate and protect critical areas. The City's critical areas regulations are codified in South Bend Municipal Code (SBMC) Chapter 14.15, Critical Areas. The City's critical areas ordinance was last updated in 2012. The critical areas chapter addresses wetlands, geologically hazardous areas, fish and wildlife habitat conservation areas, and frequently flooded areas.

Wetlands: SBMC 14.15.030(B.), Wetlands, sets forth standard buffers. The buffer for a particular wetland is based on the wetland category, wetland characteristic (e.g. habitat score) and proposed land use. The range of standard buffers that may be required under this subsection are summarized below in Table 2-1. Standard buffer widths for high intensity uses may be reduced to the standard buffer for moderate intensity uses provided several impact minimization measures related to lighting, noise, runoff, and disturbance are adopted. Buffer averaging is allowed provided that at its narrowest point, the buffer is never less than three-quarters of the required width. Wetland buffers and required mitigation ratios are consistent with Ecology recommendations (Granger et al. 2005).

Table 2-1. Wetland buffer widths under critical areas regulations.

Wetland Category	Standard Buffer Range
4	25-50 feet
3	40-150 feet
2	50-300 feet
1	50-300 feet

Geologically Hazardous Areas: As described in SBMC 14.50.040, Geologically Hazardous Areas include erosion hazards; landslide hazards; seismic hazards; and areas subject to other geological events such as coal mine hazards and volcanic hazards including mass wasting, debris flows, rockfalls, and differential settlement. Erosion hazard areas include areas designated as “severe” rill and inter-rill erosion hazard. Landslide hazard areas include areas of past slope failures; slopes over 80 percent that are subject to rockfall during seismic shaking; slopes over 40 percent with a vertical relief of 10 feet or more composed of consolidated rock, and slopes steeper than 15 percent that also intersect an area where relatively permeable sediment overlies a relatively impermeable sediment or bedrock and where springs or ground water seepage also occur. The regulations do not establish a specific buffer around geologically hazardous areas, but they specify that if technology cannot reduce risks to acceptable levels, building in geologically hazardous areas is prohibited.

Fish and Wildlife Habitat Conservation Areas: In SBMC Section 14.15.050, Fish and Wildlife Habitat Conservation Areas, buffer requirements for developments along shorelines are set forth. The typical requirements for shoreline buffers are summarized below in Table 2-2. Note that a Type S water is a Shoreline of the State.

Table 2-2. Required buffers by water type under critical areas regulations.

Water Type	Buffer
Type S water	150 feet

Type F water greater than 10 feet wide	150 feet
Type F water 10 feet or less in width	100 feet
Type Np water	75 feet
Type Ns water	50 feet

The buffers in Table 2-1 do not apply along the Willapa River from the eastern City limits downstream to the Ron Craig Boat Ramp. Along this stretch of shoreline, the City has the authority to require an upland buffer of native vegetation at least 25 feet in width along 75 percent of the shoreline length or at least 50 feet in width along 50 percent of the shoreline length. And in those areas where practical difficulties prevent the establishment or maintenance of a required buffer due to the presence of existing upland and in-water structures, the City supervisor may reduce or altogether exempt the required upland buffer or require in-water mitigation beneficial to salmonids and other wildlife. The standard stream buffers are generally consistent with guidance from the Washington Department of Fish and Wildlife (WDFW) (Knutson and Naef 1997) and the more recent scientific body of literature. The flexible buffer standards for the Willapa River appear to be guided by the principle of maintaining existing functions along the City’s developed waterfront.

Frequently Flooded Areas: The Frequently Flooded Areas provisions in the SBMC reference the City’s Flood Damage Prevention standards (SBMC 14.10). The Flood Damage Prevention standards primarily address safety factors to prevent damage to life. However, SBMC 14.10.290 prohibits fill in the floodway that would increase the water surface elevation during the base flood discharge.

2.3 State Regulatory Framework

Aside from the SMA (discussed above in Section 2.1), key components of the State regulatory framework pertinent to development in the City’s shorelines include the Hydraulic Code, Section 401 Water Quality Certification, and the Washington State Department of Natural Resources (DNR). Other relevant components include the Growth Management Act (GMA), State Environmental Policy Act, Watershed Planning Act, Water Resources Act, Salmon Recovery Act, tribal agreements and case law.

A variety of State agencies (e.g. Ecology, WDFW, DNR) are involved in implementing these laws or own shoreline areas. 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 a proposed development, State laws 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. During the comprehensive SMP update, the City will consider State regulations to ensure consistency as appropriate and feasible with the goal of streamlining the shoreline permitting process.

Summaries of some of the key components of the State regulatory framework follow.

2.3.1 Hydraulic Code

RCW 77.55, the Hydraulic Code, gives the 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.” These activities may include stream alteration, culvert installation or replacement, pier and bulkhead repair or construction, among others. In a permit called a Hydraulic Project Approval, WDFW can condition projects to avoid, minimize, restore, and compensate for adverse impacts.

2.3.2 Section 401 Water Quality Certification

Section 401 of the federal Clean Water Act allows states to review, condition, and approve or deny certain federally permitted actions that result in discharges to State waters, including wetlands. In Washington, Ecology is the State agency responsible for administering Section 401. Ecology’s primary aim is to ensure that State water quality standards and other aquatic resource protections standards are met. Actions within watercourses or wetlands within the shoreline zone that require a Section 404 permit (see below) will also need Section 401 Water Quality Certification.

2.3.3 Washington Department of Natural Resources

The DNR is charged with protecting and managing use of State-owned aquatic lands. DNR manages more than 5.6 million acres of State-owned forest, range, commercial, agricultural, conservation, and aquatic lands. DNR manages these lands for revenue, outdoor recreation, and habitat for native fish and wildlife.

Projects waterward of the OHWM require review by DNR to establish whether the project is on State-owned aquatic lands. Certain project activities on State-owned aquatic lands, such as single-family or two-party joint-use residential piers, are exempt from these requirements. DNR recommends that all proponents of a project waterward of the OHWM contact DNR to determine jurisdiction and requirements.

2.4 Federal Regulatory Framework

Key federal laws pertinent to development in the City's shorelines include the Endangered Species Act (ESA), 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, Marine Mammal Protection Act, Coastal Zone Management Act, National Historic Preservation Act, and the Migratory Bird Treaty Act.

A variety of agencies (e.g. US Army Corps of Engineers [Corps], National Marine Fisheries Service, US Fish and Wildlife Service [USFWS]) are involved in implementing these laws. Review by these agencies of shoreline development in most cases is 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. During the comprehensive SMP update, the City will consider federal laws to ensure consistency as appropriate and feasible with the goal of streamlining the shoreline permitting process.

Summaries of some of the key components of the federal regulatory framework follow:

2.4.1 Clean Water Act

Major components of the Clean Water Act include Section 404, Section 401, and the National Pollutant Discharge Elimination System (NPDES).

Section 404 provides the Corps, under the oversight of the US Environmental Protection Agency (EPA), with the authority to regulate discharge of dredged or fill material into waters of the United States, including wetlands. The extent of the Corps' authority and the definition of fill have been the subject of considerable legal activity. As applicable to the City's shoreline jurisdiction, however, it generally means that the Corps must review and approve most activities in water and wetlands. These activities may include wetland fills, in-water and wetland restoration, and culvert installation or replacement, among others. The Corps requires projects to avoid, minimize, and compensate for impacts.

Section 401 of the Clean Water Act requires that activities requiring a Section 404 permit meet water quality standards. More details on Section 401 are provided above in Subsection 2.3.2, Section 401 Water Quality Certification.

The NPDES is similar to Section 401, and it applies to ongoing point-source discharge. Permits include limits on what can be discharged, monitoring and reporting requirements, and other

provisions designed to protect water quality. Examples of discharges requiring NPDES permits include municipal stormwater discharge, wastewater treatment effluent, and discharges related to industrial activities.

2.4.2 Rivers and Harbors Appropriation Act

Section 10 of the Rivers and Harbors Appropriation Act of 1899 provides the Corps with the authority to regulate activities that may affect navigation of “navigable” waters. Designated “navigable” waters in the City include the Willapa River and the mouth of Skidmore Slough. Proposals to construct new or modify existing over-water structures (including bridges), to excavate or fill, or to “alter or modify the course, location, condition, or capacity of” navigable waters must be reviewed and approved by the Corps.

2.4.3 Endangered Species Act

Section 9 of the ESA prohibits “take” of listed species. Take has been defined in Section 3 as: “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” The take prohibitions of the ESA apply to everyone, so any action that results in a take of listed fish or wildlife would be a violation of the ESA and is strictly prohibited. Per Section 7 of the ESA, activities with potential to affect federally listed or proposed species and that require federal approval, receive federal funding, or occur on federal land must be reviewed by the National Marine Fisheries Service and/or USFWS via a process called “consultation.” Activities requiring a Section 10 or Section 404 permit also require such consultation if these activities occur in waters with listed species.

2.5 Regulatory Framework for Dredging

Dredging projects typically involve multiple agencies. The following discussion assumes that new permits are required for a dredging project (as opposed to performing dredging under an existing permit). Maintenance dredging is conducted at the South Bend City Docks and Coast Seafoods facility (Chaffee 2013). Permits are required to be obtained from: the Corps, Ecology, WDFW, and the City. Before applying for a permit, an applicant must obtain a Suitability Determination or other decision document from the Dredged Material Management Program that evaluates the proposed project. As part of the Corps process, ESA consultation with the USFWS and the National Marine Fisheries Service will be conducted. If in-water disposal is proposed, a Site Use Authorization from DNR is also required.

3 SUMMARY OF ECOLOGICAL SETTING

3.1 Climate

South Bend is located in a temperate maritime climate. Annual rainfall in the Willapa basin ranges from 44 to 145 inches depending on location (Smith 1999); in South Bend, average annual precipitation is approximately 77 inches (Creative Community Solutions 2013). Precipitation is concentrated in the winter months, and most precipitation falls as rain below 1,500 feet.

3.2 Geology

South Bend is located in the Willapa Hills physiographic region (see Figure 3-1), which includes the Black Hills, Doty Hills, and the broad valleys that lead to the Pacific Ocean. The following description of the geologic setting is derived from Lasmanis' *Geology of Washington* (1991).

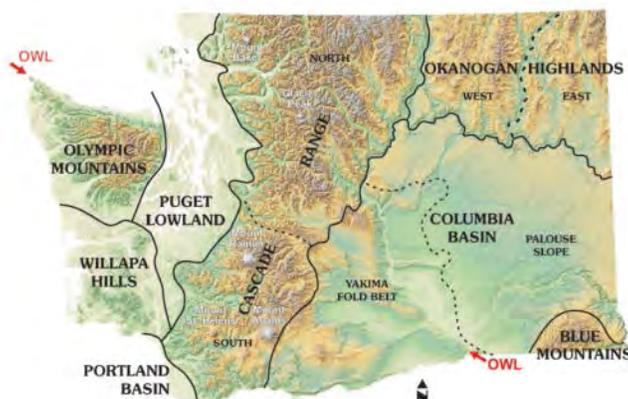


Figure 3-1. Physiographic provinces of Washington State, including Willapa Hills.

During the middle and late Miocene, Columbia River basalt flowed down the Columbia River to the Pacific Ocean, Willapa Bay, and Grays Harbor. These flows formed many of the basaltic intrusions and headlands that remain today. The Willapa Hills were not subject to subduction tectonism or metamorphism. Erosional weathering of the sedimentary beds in the Willapa Hills began in the Pliocene and continued rapidly, resulting in the rounded topography and deep weathering profiles apparent today.

The combination of steep slopes, erodible geology, and abundant rainfall contribute to high landslide susceptibility in the upper watershed. Most landslides have been shallow slides or debris flows, but deep-seated landslides have also occurred. The hydrologic and vegetative changes that accompany forestry activities have increased landslide activity in the region.

Estuaries, including Willapa Bay, show evidence of repeated episodes of sudden submergence associated with subduction earthquakes, followed by uplift.

Soils in the City's shorelines predominantly consist of alluvial deposits. Uplands are typically sandy alluvium, whereas tidal wetland areas are typically composed of clay or other fine-grained materials.

3.3 Geography, Topography, and Drainage Patterns

South Bend is located approximately six miles upstream from the mouth of the Willapa River. Water levels in the City are affected by river flows and tides. Potter and Skidmore Sloughs are located, respectively, along the western and eastern borders of the City, and a large wetland complex north of the Willapa River occupies much of the City's north boundary. The City is located just west of the City of Raymond and the unincorporated area of Eklund Park. A natural constriction point in the Willapa River, called "The Narrows", is located just east of the City (see Figure 3-2).

Most of the City's commercial lands and about one-quarter of its residential neighborhoods are on level land ranging 10 to 40 feet in elevation (Creative Community Solutions 2013). Hillsides along its southern border quickly climb to elevations of 200 feet (Creative Community Solutions 2013), and these higher elevation areas are generally undeveloped, forested areas.



Figure 3-2. The Narrows (foreground), looking downstream toward South Bend along the Willapa River.
(Source: Ecology)

Flows in the Willapa River vary significantly by season. Over the past approximately 60 years, annual peak flows just upstream from the City in the unincorporated area of Willapa have ranged from approximately 2,000 to 15,000 cfs (USGS, electronic reference). Flows tend to be lowest in the months of July through September when they are typically in the range from 20 to 150 cfs (USGS, electronic reference). The Willapa watershed does not include any large mountains with glaciers or regular accumulations of significant snowpack; therefore, drainages in the Willapa Basin tend to have peak streamflows in winter months.

The tidal range at the City of South Bend is approximately 10 feet. Tidal currents near the City are about 2.0 feet per second on the flood and 2.4 feet per second on the ebb (NOAA 2014b).

Information about flooding in South Bend is available through FEMA's Preliminary Flood Insurance Study (2013). Floods occur through the following mechanisms.

- When periods of high winter precipitation and river flows correspond with spring tides, flows back up, resulting in temporary flooding of low lying areas. A dike under Highway 101 provides the eastern portion of the city with 10-year flood protection for high tides.
- If tide gates on the underground storm sewer systems that drain into the Willapa River become blocked open, stormwater drainage accumulates, causing temporary flooding.
- Localized precipitation that overwhelms undersized culverts or that occurs where there is insufficient hydraulic gradient for drainage can also result in localized flooding.

Although diking historically occurred around the City to create useable land, the 2013 FEMA report indicates that the levees are “generally not substantial structures and are not high enough to provide more than minimal protection against the more frequent events.” The embankment for U.S. Highway 101 forms a dike which protects the eastern portion of the City of South Bend against the “10-percent-annual-chance high tide.” The mapped floodplain is generally limited to areas below the OHWM of the Willapa River, undeveloped areas north of the Willapa River, and areas around Skidmore Slough.

As a result of its geology and low-lying topography, much of the City’s developed area is subject to liquefaction and tsunami hazards.

3.4 Key Species and Habitats

Shallow water estuarine ecosystems, such as Potter Slough and marsh complexes on the northern side of the Willapa River, are particularly productive ecosystems that provide important habitats for the rearing of small, subyearling ocean-type Chinook salmon during estuarine residency (Levings et al. 1991, Levings et al. 1995, Bottom et al. 2005). Shallow water estuarine habitats may provide spatial separation from aquatic predators that reside in deeper waters, improved protection from predators through higher turbidity levels (Gregory and Levings 1998), as well as improved foraging capacity (Levings et al. 1991). Although conditions in the Lower Willapa River are not generally suitable for salmon spawning habitat, tributaries to Skidmore Slough in unincorporated Pacific County produce coho and chum salmon (Smith 1999). Tide gates on Skidmore Slough restrict tidal influence there, which likely limits habitat access for juvenile salmonids produced in the Willapa River.

Although riparian vegetation is limited throughout most of the City, riparian vegetation provides a broad range of critical functions for water quality and habitat. Functions related to water quality include filtration of nutrients, bacteria, sediment, and other contaminants

(Naiman and Decamps 1997, Mayer et al. 2007). Riparian functions important to fish and wildlife habitats include microclimate regulation, invertebrate and detrital food sources for juvenile fish, shaded cover, and woody debris recruitment (Naiman and Decamps 1997).

Table 3-1 includes a list of priority species and habitat management areas mapped within the City’s shoreline areas. Note that priority regions may occur in the City but are not mapped.

Table 3-1. Priority species and habitats within the shoreline areas of South Bend.

Category	Species/Habitats	State Status	Federal Status
Fish	Bull Trout	Candidate	Threatened
	Chinook Salmon	Candidate	Threatened
	Chum Salmon	Candidate	Threatened
	Coastal Res./ Searun Cutthroat	--	Species of Concern
	Coho Salmon	--	--
	Green Sturgeon*	--	Threatened
	Steelhead Trout	Candidate	Threatened
Birds	Wood duck breeding areas	--	--
	Waterfowl concentrations	--	--
	Spotted Owl management buffer	Endangered	Threatened
Wetlands	Palustrine	--	--
	Estuarine intertidal	--	--

* Although not mapped by WDFW, the City’s tidally influenced shorelines are included in the designated Critical Habitat for green sturgeon under the ESA.

3.4.1 Non-Native, Invasive Species

A list of many of the non-native and invasive species present in the County that could occur in South Bend are identified in Table 3-2.

Non-native, invasive vegetation often forms dense monocultures that preclude native vegetation and alter the ecosystem. Potential effects of invasive plant species in riparian and instream habitats include increased instream water temperatures, lowered dissolved oxygen, changes in pH, reduced bank stability, altered flow conditions and increased localized flooding.

Spartina was introduced into Willapa Bay in 1894 as packing material for oyster shipments from the East Coast (Ecology, electronic reference (a)). In 2002, *Spartina* had colonized 15,000 acres of former mudflat in Willapa Bay (Ecology, electronic reference (a)). By establishing marsh vegetation, *Spartina* encourages deposition and transforms mud flats into marshes. This change displaces functions associated with mud flat habitats, including shellfish beds in Willapa Bay and shorebird foraging habitat. Following a coordinated effort among government, non-profit,

and private entities to eliminate *Spartina*, today only isolated patches of the plant remain in Willapa Bay and the lower reaches of the Willapa River.

Table 3-2. Non-native, invasive species present within shoreline jurisdiction in Pacific County that could occur in South Bend.

Type	Species
Vegetation	Spartina
	Knotweed
	English ivy
	Yellow flag iris
	Purple loosestrife
Aquatic mammals	Nutria
Crustaceans	Green crab
	Chinese mitten crab
	Non-native copepods

3.5 Major Land Use Changes and Current Shoreline Condition

The City of South Bend developed as a lumber town in the late 1800s and early 1900's. Logging in the Willapa River basin has had a significant effect on the freshwater shorelines in the watershed. As a result of past forest practices, the watershed has experienced reduced large woody debris (LWD) densities, reduced riparian tree cover, and excess sediment inputs (Applied Environmental Services 2001). Fish passage barriers, incised channels, and high summer water temperatures are also conditions associated with past timber harvest that limit natural processes in the basin (Applied Environmental Services 2001). Today, forest management is regulated by the State Forest Practices Act.

The City's waterfront is home to several seafood processing industrial uses. The City's economy is closely tied to the aquaculture industry of Willapa Bay. Additionally, a small, local fishery is based in the City. These facilities include overwater structures, such as piers and docks. Dredging of the deep-draft river channel in Willapa Harbor was discontinued by the Corps in 1995 because of marginal benefits. A depth of 10 feet relative to MLLW is necessary to accommodate ongoing uses at the South Bend City Docks. This entails regular dredging on an approximately 10-year cycle, conducted by the Port of Willapa Harbor.

The Willapa River at South Bend is designated as a Class A surface water under Surface Water Quality Standards (Chapter 173-201A WAC). A Total Maximum Daily Load (TMDL) has been established for bacteria and dissolved oxygen, which have previously exceeded established thresholds in the Lower Willapa River. As part of an effort to address dissolved oxygen

concerns associated with the South Bend and Raymond wastewater treatment plants (WWTPs), the two cities entered an interlocal agreement to construct and treat wastewater at a combined regional WWTP located in Raymond. The new WWTP went on-line in 2013, and the former South Bend facility was decommissioned. The new \$30 million WWTP is capable of treating the projected flows of both communities until at least 2027 while meeting water quality standards (Creative Community Solutions 2013). A summary of impaired water quality listings in South Bend’s shoreline jurisdiction is provided in Table 3-3.

Table 3-3. Impaired water quality listings in South Bend’s shoreline jurisdiction.
 (Source: Ecology 2012.)

Waterbody	Parameter	Status
Unnamed tributary to Willapa River	Bacteria	TMDL
Willapa River	Bacteria Bacteria and Dissolved Oxygen	303(d) impaired TMDL

3.5.1 Sea Level Rise

Local sea level change can occur due to a combination of factors including eustatic change, which is sea level change due to changes in the total volume of ocean water or changes in the volumetric capacity of the ocean basins, and local effects such as tectonic uplift. Changes in the world’s ocean volume have numerous sources including the melting of ice caps and glaciers and thermal expansion of the oceans due to global warming (Committee et al. 2012). The information on sea level rise along County shorelines is relatively limited. Although long-term sea level rise records are relatively sparse for the region, there is indication that the rate of eustatic sea level rise exceeds the rate of tectonic uplift for the Central Washington Coast and Pacific County. National Oceanographic and Atmospheric Administration (NOAA), based on data from the long-term tidal station at Toke Point in Willapa Bay, has estimated a mean sea level rise trend of 0.73 millimeter per year ± 1.05 millimeters per year between 1973 and 2012 (NOAA 2014a). It is expected that there will continue be a net rise in the sea level in Willapa Bay, and correspondingly in the tidally influenced portions of the Willapa River in the future. Mote et al. (2008) developed three alternatives for sea level rise for the Central Washington Coast that indicate sea level rise of 1 to 18 inches by 2050 and 2 to 43 inches by 2100. These changes could contribute to increased flooding frequency in the City.

4 SHORELINE INVENTORY

4.1 Inventory Data

The shoreline inventory is intended to document the existing or baseline conditions in the City's shorelines. At a minimum, local jurisdictions must gather the inventory elements listed in the Guidelines (at WAC 173-26-201(3)(c)), to the extent information is relevant and readily available.

Information collected for South Bend's shoreline inventory principally included watershed and other basin documents, regional studies, scientific literature, aerial photographs, and geographic information systems (GIS) data from a variety of data providers. Table 4-1 lists those relevant inventory elements for which spatial data is available. The table also describes the spatial information gathered for each of the required inventory elements, and identifies data limitations and assumptions. Map figures provided in the Map Folio (Appendix B) depict the various inventory elements listed in the table.

Table 4-1. Shoreline inventory elements and information.

Inventory Element	Information Gathered	Inventory Map	Data Source	Use/Assumptions/Limitations
Land use patterns	• Major land ownership	5	Pacific County, 2013	• Identifies major land owners only
	• Aquatic land parcels	5	DNR, 2013	
	• Current land use	4	Pacific County, 2014	• Gross scale characterization (e.g. residential, services) • Useful in assessing existing intensity and type of development at broad-scale planning level • Land use data may not be updated as frequently as other property information; however, it represents the best readily available information
	• Existing environment designations	1	Olympic Natural Resource Center, 2013	• Not official City data
	• Comprehensive land use / zoning	3	Pacific County, 2012	• Based on area-wide categorization and includes roads, easements, and utilities
	• Seafood processors		Washington Department of Health, 2009	
Public access¹	• City parks	6	Pacific County, 2014	
	• County parks	6	Pacific County, 2013	
	• Boat launches/facilities	6	Washington Recreation and Conservation Office, 2011	
	• Shoreline public access sites	6	Ecology, 2011	

¹ Additional informal, unmapped public access locations may exist in the City.

Inventory Element	Information Gathered	Inventory Map	Data Source	Use/Assumptions/Limitations
	• Shoreline public access	6	Ecology, 2010	
	• Trails	6	Pacific County, 2014	
	• Washington State Parks	6	Washington State Parks, 2013	
	• Bonneville Power Administration utility corridors	6	Bonneville Power Administration, 2008	
Surface water	• Water types	8	DNR / Pacific County, 2014	• Small, intermittent or ephemeral streams may not be identified in data
	• Flow control structures	8	Pacific County, 2013	
Sewer and septic	• Mapped sewer lines	7	Pacific County, 2011 - 2014	
	• Ecology-permitted sewage sites	7	Ecology, 2013	
	• Wastewater facilities	7	Pacific County, 2009	
	• Sewage outfalls	7	Washington Department of Health, 2000	• Other outfalls (e.g. stormwater) are not comprehensively mapped.
Soils	• Soil types	10	DNR, 2013	• Based on broad scale soil mapping • Not to be used in place of site-specific studies

Inventory Element	Information Gathered	Inventory Map	Data Source	Use/Assumptions/Limitations
Vegetation / Land cover	<ul style="list-style-type: none"> • Terrestrial vegetation type and land cover • Impervious surface coverage 	9, 12	NOAA Coastal Change Analysis Program	<ul style="list-style-type: none"> • Based on interpretation of multispectral imagery at 30 x 30 m cell resolution • Useful for broad scale assessment of vegetation coverage and extent of existing development • Not useful for accurate characterization of fine scale data (e.g. parcel level, species composition) • May overestimate or underestimate coverage when type of coverage within cells is mixed • Data may not be up-to-date (released every 5-10 years)
Geologically hazardous areas	<ul style="list-style-type: none"> • Tsunami inundation areas 	13	DNR, Geology and Earth Sciences Division, 2010	<ul style="list-style-type: none"> • Requires site-specific review to verify presence/absence of geologic hazards
	<ul style="list-style-type: none"> • Slope Stability 	13	Pacific County, 2013	<ul style="list-style-type: none"> • Requires site-specific review to verify presence/absence of geologic hazards
Floodplains	<ul style="list-style-type: none"> • Floodplain 	14	Federal Emergency Management Agency, 2013	<ul style="list-style-type: none"> • Floodplain based on federal models, and may contain some inaccuracies • Draft Flood Insurance Rate Map data is preliminary; provided by Pacific County

Inventory Element	Information Gathered	Inventory Map	Data Source	Use/Assumptions/Limitations
Wetlands	<ul style="list-style-type: none"> Potential wetlands 	15	USFWS National Wetland Inventory (NWI), 2013	<ul style="list-style-type: none"> Useful for broad scale assessment of potential wetlands NWI mapping based on interpretation of multi-spectral imagery Many wetlands are not identified by NWI mapping; mapped wetlands may not meet wetland criteria Not to be used in place of site-specific studies
	<ul style="list-style-type: none"> Hydric soils 	15	DNR, 2013	
Water resources	<ul style="list-style-type: none"> Principal aquifers 	11	U.S. Geological Service (USGS), 2002	
	<ul style="list-style-type: none"> Individual wells 	11	Ecology, 2013	
Habitats and species	<ul style="list-style-type: none"> Priority habitats & species (PHS) 	16, 17, 18	WDFW, 2011	<ul style="list-style-type: none"> WDFW maps do not capture every priority species location or habitat, particularly for rare species or species that use shoreline habitats seasonally or intermittently Absence of mapping information does not indicate absence of a particular species The number of documented species may reflect the relative amount of past survey efforts New data will need to be obtained at the time of project application
Shoreline modifications	<ul style="list-style-type: none"> Percent of shoreline modified 	19	DNR, 2006	
	<ul style="list-style-type: none"> Dikes and levees 	19	Western Washington University, 2010	

Inventory Element	Information Gathered	Inventory Map	Data Source	Use/Assumptions/Limitations
	<ul style="list-style-type: none"> Overwater structures 	19	DNR, 2007	<ul style="list-style-type: none"> Overwater structures may include docks, bridges, floats, structural support fill, and other structures
	<ul style="list-style-type: none"> Culverts 	19	WDFW, 2004	
Water quality	<ul style="list-style-type: none"> 305(b) list 	20	Ecology, Water Quality Assessment 305(b) Report, 2012	<ul style="list-style-type: none"> Water quality impairments are based on monitoring at specific locations Impairments may extend beyond the mapped area
Ecology permitted sites	<ul style="list-style-type: none"> Ecology permitted sites 	21	Ecology / Pacific County 2013	<ul style="list-style-type: none"> Shows the locations of Ecology's regulated facilities and to provide basic information about their operation and/or business characteristics

4.2 Data Gaps

Table 4-2 identifies data gaps in the shoreline inventory. Despite these data gaps, a substantial quantity of information about South Bend’s shorelines is available to aid in the development of the inventory and analysis report, as well as the SMP update.

Table 4-2. Inventory data gaps.

Data Gap	Comment
Channel migration zone	Existing channel migration zone (CMZ) data was not available for shorelines within South Bend. The 100-year floodplain may be used as a proxy for the CMZ except where areas are separated from the channel by a legally existing artificial structure.
Shoreline armoring	Citywide data were not available for shoreline stabilization, such as riprap. To address this data gap, a visual assessment of shoreline stabilization using aerial photography was incorporated into the analysis of ecological functions. However, visual assessment is likely to underestimate the extent of armoring.

4.3 Inventory and Analysis Reach Delineation

For purposes of shoreline analysis, the City’s shorelines were broken down into seven segments or “reaches.” The criteria in Table 4-3 were used to determine reach break locations. Land use (e.g. existing and planned adjacent land use patterns, shoreline modifications) was weighted heavily in determining reach break locations, in recognition that the intensity and type of land use will affect shoreline ecological conditions. Furthermore, functional analysis outcomes will be more relevant for future determination of appropriate shoreline environment designations if the reach breaks occur at possible transition points in environment designations. In addition to land use, physical drivers of shoreline processes were used to establish an overall framework for determining reach break locations.

Table 4-3. Criteria for determining reach breaks.

Priority	Factors weighed in determining reach break location
1	Changes in land use ¹
2	Tributary/Slough confluences
3	Changes in vegetation (coverage and type)

¹ Reach breaks were generally identified at the nearest parcel boundary, except with large parcels, where physical or ecological factors changed notably within a single parcel.

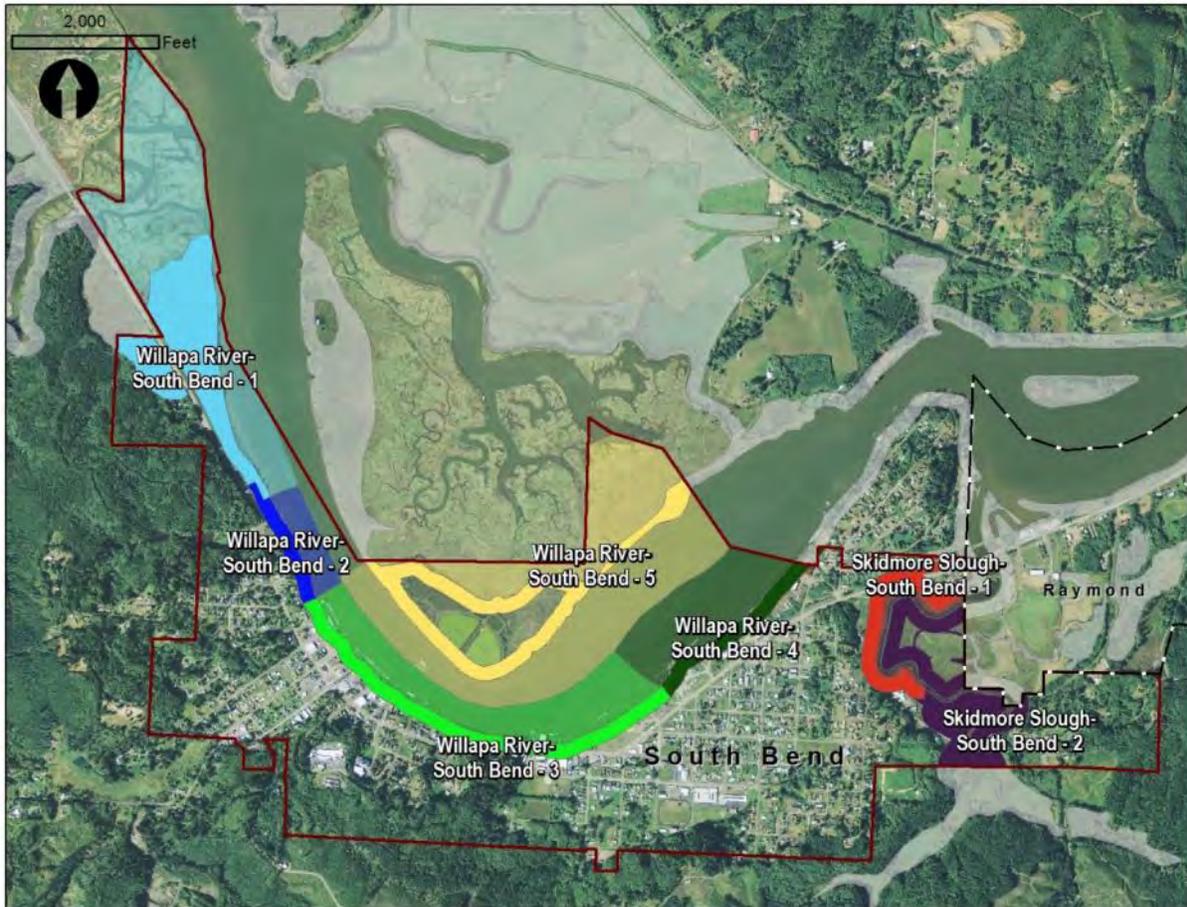


Figure 4-1. Shoreline reaches.

4.4 Inventory Data Summary

Table 4-4 provides a summary of select inventory information described in Table 4-1. The inventory information is organized according to the reaches just described in the previous section.

Table 4-4. Summary of shoreline inventory by reach.

Reach	Area, Length	Land Use Patterns	CCAP Land Cover (% Area landward of OHWM)	Critical Areas	Modifications
Skidmore Slough - 1	18.5 AC 3,784 LF	<p><i>Current Land Use</i></p> <ul style="list-style-type: none"> • Vacant/Undeveloped 8.2 AC / 44.3% • Residential 2.4 AC / 12.9% • Government/Institutional 0.8 AC / 4.5% • Manufacturing/Industrial 0.2 AC / 1.1% • Not Classified 6.9 AC / 37% <p><i>Comprehensive Plan</i></p> <ul style="list-style-type: none"> • Neighborhood 9.1 AC / 49.3% • Downtown & Commercial 3.7 AC / 19.8% • Unknown 5.6 AC / 30% <p><i>Zoning</i></p> <ul style="list-style-type: none"> • Residential Single Family (R-1) 1.9 AC / 10% • Not Zoned 16.0 AC / 89.5% <p><i>Current Shoreline Designation</i></p> <ul style="list-style-type: none"> • Urban 	<p><i>Impervious surfaces</i></p> <ul style="list-style-type: none"> • Low-intensity developed 35.5% • Developed open space 14.4% <p><i>Vegetation</i></p> <ul style="list-style-type: none"> • Deciduous Forest 1.4% • Scrub/Shrub 3.2% • Palustrine Emergent Wetland 35.7% • Palustrine Forested Wetland 3.3% • Palustrine Scrub/Shrub Wetland 5.6% 	<p><i>Floodplains</i></p> <p>8.9 AC / 50.0%</p> <p><i>NWI Freshwater Wetlands</i></p> <p>5.2 AC / 27.8%</p> <p><i>Salt Marsh (% area below OHWM)</i></p> <p>3.6 AC / 90.0%</p>	<p><i>Roads</i></p> <p>2,331 LF</p> <p><i>Levees</i></p> <p>13 LF</p>

Reach	Area, Length	Land Use Patterns	CCAP Land Cover (% Area landward of OHWM)	Critical Areas	Modifications
Skidmore Slough - 2	37.0 AC 7,422 LF	<p><i>Current Land Use</i></p> <ul style="list-style-type: none"> Government/Institutional 21.2 AC / 57.5% Residential 8.7 AC / 23.5% Forestry 2.9 AC / 7.9% Vacant/Undeveloped 1.4 AC / 3.7% Not Classified 2.7 AC / 7.3% <p><i>Comprehensive Plan</i></p> <ul style="list-style-type: none"> Neighborhood 18.7 AC / 50.5% Environmental Protection 15.0 AC / 40.5% Downtown & Commercial 0.6 AC / 1.7% Unknown 2.2 AC / 7.4% <p><i>Zoning</i></p> <ul style="list-style-type: none"> Not Zoned 37.0 AC / 100% <p><i>Current Shoreline Designation</i></p> <ul style="list-style-type: none"> Urban 	<p><i>Impervious surfaces</i></p> <ul style="list-style-type: none"> Low-intensity developed 6.7% Developed open space 1.3% <p><i>Vegetation</i></p> <ul style="list-style-type: none"> Evergreen Forest 3.6% Deciduous Forest 1.7% Grassland 1.2% Scrub/Shrub 9.0% Palustrine Emergent Wetland 58.4% Palustrine Forested Wetland 6.7% Palustrine Scrub/Shrub Wetland 11.1% 	<p><i>Floodplains</i></p> <p>33.2 AC / 89.8%</p> <p><i>NWI Freshwater Wetlands</i></p> <p>17.3 AC / 46.9%</p> <p><i>Salt Marsh (% area below OHWM)</i></p> <p>4.6 AC / 79.2%</p>	<p><i>Roads</i></p> <p>1,864 LF</p> <p><i>Levees</i></p> <p>0 LF</p>

Reach	Area, Length	Land Use Patterns	CCAP Land Cover (% Area landward of OHWM)	Critical Areas	Modifications
Willapa River - 1	51.4 AC 5,968 LF	<p><i>Current Land Use</i></p> <ul style="list-style-type: none"> • Government/Institutional 30.4 AC / 59.2% • Forestry 9.3 AC / 18.1% • Agriculture 6.9 AC / 13.4% • Vacant/Undeveloped 3.1 AC / 6.1% • Not Classified 1.7 AC / 3.3% <p><i>Comprehensive Plan</i></p> <ul style="list-style-type: none"> • Environmental Protection 40.4 AC / 78.5% • Neighborhood 9.3 AC / 18.1% • Unknown 1.8 AC / 3.4% <p><i>Zoning</i></p> <ul style="list-style-type: none"> • Commercial (C) 37.7 AC / 73% • Agricultural (A) 9.2 AC / 18% • Not Zoned 4.6 AC / 8.9% <p><i>Current Shoreline Designation:</i></p> <ul style="list-style-type: none"> • Conservancy • Urban 	<p><i>Impervious surfaces</i></p> <ul style="list-style-type: none"> • Developed open space 4.4% <p><i>Vegetation</i></p> <ul style="list-style-type: none"> • Evergreen Forest 3.0% • Deciduous Forest 1.7% • Grassland 1.2% • Scrub/Shrub 9.0% • Palustrine Emergent Wetland 58.4% • Palustrine Forested Wetland 6.7% • Palustrine Scrub/Shrub Wetland 11.1% 	<p><i>Floodplains</i></p> <p>13.1 AC / 25.5%</p> <p><i>NWI Freshwater Wetlands</i></p> <p>50.5 AC / 98.2%</p> <p><i>Salt Marsh (% area below OHWM)</i></p> <p>70.9 AC / 73.8%</p>	<p><i>Roads</i></p> <p>0 LF</p> <p><i>Levees</i></p> <p>440 LF</p>

Reach	Area, Length	Land Use Patterns	CCAP Land Cover (% Area landward of OHWM)	Critical Areas	Modifications
Willapa River - 2	7.7 AC 1,533 LF	<p><i>Current Land Use</i></p> <ul style="list-style-type: none"> • Government/Institutional 2.6 AC / 34% • Residential 0.2 AC / 2.6% • Not Classified 4.9 AC / 63.2% <p><i>Comprehensive Plan</i></p> <ul style="list-style-type: none"> • Downtown & Commercial 1.0 AC / 13.5% • Neighborhood 0.2 AC / 2.9% • Unknown 6.4 AC / 83.6% <p><i>Zoning</i></p> <ul style="list-style-type: none"> • Commercial (C) 3.8 AC / 50% • Residential Single Family (R-1) 2.7 AC / 35% • Agricultural (A) 1.0 AC / 13% • Not Zoned 0.1 AC / 1.9% <p><i>Current Shoreline Designation</i></p> <ul style="list-style-type: none"> • Conservancy • Urban 	<p><i>Impervious surfaces</i></p> <ul style="list-style-type: none"> • Medium-intensity developed 11.0% • Low-intensity developed 45.3% • Developed open space 9.2% <p><i>Vegetation</i></p> <ul style="list-style-type: none"> • Evergreen Forest 9.3% • Deciduous Forest 3.0% • Grassland 2.9% • Pasture/Hay 4.3% • Unconsolidated Shore 14.8% 	<p><i>Floodplains</i></p> <p>1.4 AC / 18.8%</p> <p><i>NWI Freshwater Wetlands</i></p> <p>0.01AC / 1.5%</p> <p><i>Salt Marsh (% area below OHWM)</i></p> <p>NA</p>	<p><i>Roads</i></p> <p>1,497 LF</p> <p><i>Levees</i></p> <p>0 LF</p>

Reach	Area, Length	Land Use Patterns	CCAP Land Cover (% Area landward of OHWM)	Critical Areas	Modifications
Willapa River- 3	27.2 AC 5,751 LF	<p><i>Current Land Use</i></p> <ul style="list-style-type: none"> • Vacant/Undeveloped 5.1 AC / 18.6% • Commercial 4.6 AC / 16.8% • Residential 3.8 AC / 14.0% • Manufacturing/Industrial 2.1 AC / 7.8% • Water 2.0 AC / 7.4% • Government/Institutional 0.7 AC / 2.6% • Not Classified 8.4 AC / 30.9% <p><i>Comprehensive Plan</i></p> <ul style="list-style-type: none"> • Downtown & Commercial Waterfront Overlay 15.0 AC / 55.3% • Downtown & Commercial 2.3 AC / 8.3% • Neighborhood 1.5 AC / 5.5% • Unknown 8.4 AC / 31% 	<p><i>Impervious surfaces</i></p> <ul style="list-style-type: none"> • High-intensity developed 28.0% • Medium-intensity developed 15.6% • Low-intensity developed 15.4% <p><i>Vegetation</i></p> <ul style="list-style-type: none"> • Unconsolidated Shore 40.2% 	<p><i>Floodplains</i></p> <p>2.2 AC / 0.8%</p> <p><i>NWI Freshwater Wetlands</i></p> <p>0.5 AC / 1.7%</p> <p><i>Salt Marsh (% area below OHWM)</i></p> <p>1.1 AC / 1.9%</p>	<p><i>Roads</i></p> <p>5,150 LF</p> <p><i>Levees</i></p> <p>0 LF</p>

Reach	Area, Length	Land Use Patterns	CCAP Land Cover (% Area landward of OHWM)	Critical Areas	Modifications
Willapa River- 3		<p><i>Zoning</i></p> <ul style="list-style-type: none"> • Commercial (C) 23.1 AC / 85% • General Residential (R-2) 3.2 AC / 12% • Residential Single Family (R-1) 0.5 AC / 2% <p><i>Current Shoreline Designation</i></p> <ul style="list-style-type: none"> • Urban • Conservancy 			

Reach	Area, Length	Land Use Patterns	CCAP Land Cover (% Area landward of OHWM)	Critical Areas	Modifications
Willapa River - 4	12.3 AC 2,560 LF	<p><i>Current Land Use</i></p> <ul style="list-style-type: none"> Government/Institutional 4.481 AC / 36.5% Water 2.513 AC / 20.4% Quasi Public 2.133 AC / 17.4% Fishing 0.710 AC / 5.8% Residential 0.129 AC / 1.0% Not Classified 2.325 AC / 18.9% <p><i>Comprehensive Plan</i></p> <ul style="list-style-type: none"> Downtown & Commercial Waterfront Overlay 9.8 AC / 80.0% Neighborhood 0.1 AC / 1% Unknown 2.3 AC / 19% <p><i>Zoning</i></p> <ul style="list-style-type: none"> Industrial (I) 10.0 AC / 81% Not Zoned 2.1 AC / 19% <p><i>Current Shoreline Designation</i></p> <ul style="list-style-type: none"> Urban 	<p><i>Impervious Surfaces</i></p> <ul style="list-style-type: none"> High-intensity developed 15.9% Medium-intensity developed 26.4% Low-intensity developed 29.8% Developed open space 4.6% <p><i>Vegetation</i></p> <ul style="list-style-type: none"> Grassland 3.4% Pasture/Hay 5.6% Unconsolidated Shore 13.4% 	<p><i>Floodplains</i></p> <p>1.0 AC / 8.4%</p> <p><i>NWI Freshwater Wetlands</i></p> <p>0.2 AC / 1.7%</p> <p><i>Salt Marsh (% area below OHWM)</i></p> <p>0.5 AC / 1.2%</p>	<p><i>Roads</i></p> <p>0 LF</p> <p><i>Levees</i></p> <p>0 LF</p>

Reach	Area, Length	Land Use Patterns	CCAP Land Cover (% Area landward of OHWM)	Critical Areas	Modifications
Willapa River - 5	38.3 AC 11,671 LF	<p><i>Current Land Use</i></p> <ul style="list-style-type: none"> Government / Institutional 31.5 AC / 82.1% Quasi Public 4.0 AC / 10.5% Water 0.6 AC / 1.5% Vacant/Undeveloped 0.1 AC / <1% Not Classified 2.6 AC / 5.5% <p><i>Comprehensive Plan</i></p> <ul style="list-style-type: none"> Environmental Protection 36.2 AC / 94.5% Unknown 2.1 AC / 5.5% <p><i>Zoning</i></p> <ul style="list-style-type: none"> Agricultural (A) 38.0 AC / 99% Not Zoned 0.3 AC / <1% <p><i>Current Shoreline Designation</i></p> <ul style="list-style-type: none"> Conservancy Urban 	<p><i>Impervious Surfaces</i></p> <p>NA</p> <p><i>Vegetation</i></p> <ul style="list-style-type: none"> Palustrine Emergent Wetland 9.7% Palustrine Scrub/Shrub Wetland 1.8% Estuarine Emergent Wetland 84.5% Unconsolidated Shore 4.0% 	<p><i>Floodplains</i></p> <p>18.7AC / 48.8%</p> <p><i>NWI Freshwater Wetlands</i></p> <p>8.1 AC / 21.2%</p> <p><i>Salt Marsh (% area below OHWM)</i></p> <p>53.2 AC / 37.8%</p>	<p><i>Roads</i></p> <p>0 LF (an unmapped access road leads to the WWTP)</p> <p><i>Levees</i></p> <p>1,884 LF</p>

5 ANALYSIS OF ECOLOGICAL CHARACTERISTICS

5.1 Functions and Impairments

The analysis of reach functions was based on the four major function categories identified in the Guidelines: hydrologic, hyporheic, shoreline vegetation, and habitat. The four primary functional categories were further broken down into relevant functions identified in WAC 173-26-201(3)(d)(i). Table 5-1 provides a brief description of each function, as well as potential effects of land use and potential indicators for each major function from available spatial data.

Table 5-1. Summary of shoreline ecological functions.

Hydrologic Functions	
Water and sediment processes	In South Bend, water and sediment transport processes are primarily affected by river flows and tides. Sediment accretion and localized erosion are key processes responsible for the formation of complex tidal marshes. Off-channel areas and large wetland complexes help moderate peak flow velocities.
Energy attenuation	Vegetated uplands help to desynchronize flooding impacts downstream. Broad, vegetated floodplain wetlands and tidal marshes help slow and disperse flood flows. Intertidal and shoreline habitats, such as tidal marshes, help attenuate wave and tidal energy.
Developing complex habitats	Sediment accretion and erosion are key processes responsible for the formation of complex tidal marsh habitats.
Recruitment and transport of LWD and organic material	The periodic tidal inundation of intertidal salt marshes results in significant export of organic detritus.
Removing excess nutrients and toxic compounds	Tidal marsh vegetation helps filter and store nutrients and contaminants through regular tidal inundation.

Land use impacts on hydrologic functions: Dikes restrict tidal exchange and tide gates result in unidirectional flow. Disconnected lands behind dikes tend to subside as organic materials decompose and are not replaced by tidally driven sediment transport. Armored shorelines that lack natural vegetation tend to accelerate flow, increasing erosional forces along adjacent shorelines. Development can increase contaminant loads, while concentrating and channelizing stormwater. Direct wastewater outfalls can also directly impact water quality.

Data indicators: Armoring, dikes, tide gates, wetlands, outfalls

Hyporheic Functions	
Removing excess nutrients and toxic compounds	Nutrients and toxic compounds may be filtered or removed by uptake in shallow alluvial soils and tidal wetland vegetation.
Water and sediment storage	Tidal wetlands provide for temporary storage of water and sediment during high flows and high tides.
Support of vegetation	Hyporheic flow helps support tidal marsh vegetation.
Maintenance of base flows	Groundwater/surface water interactions are important to maintain base flows.

Land use impacts on hyporheic functions: Isolation and fill of tidal wetlands limits hyporheic functions.

Data indicators: Alluvial soils and wetlands

Vegetative Functions	
Temperature regulation	Tidal marsh and riparian vegetation helps moderate water temperatures locally.

Provision of LWD and other organic matter	Salt marsh productivity is among the highest reported for any ecosystem. Riparian forested vegetation provides a source of large woody debris recruitment, and provides organic matter in the form of leaves, branches, and terrestrial insects.
Filtering excess nutrients, fine sediment, and toxic substances	Dense riparian and wetland vegetation encourages infiltration of surface water. Nutrients and contaminants in subsurface water are filtered out of the soil and taken up by the roots of plants. Nutrient and contaminant filtration is particularly high in tidal marshes as a result of the periodic inundation.
Energy attenuation	Riparian and tidal marsh vegetation helps attenuate flows along the shoreline. Vegetative root structure stabilizes shoreline soils and limits excessive erosion.

Land use impacts on vegetative functions: Vegetation removal limits riparian functions. Fill or isolation of tidal marshes and armoring of shorelines isolates the river from potential sources of organic material recruitment. Armored shorelines that lack natural vegetation tend to accelerate flow, increasing erosional forces along adjacent shorelines. Development contributes to nutrient and contaminant loads. Impervious surfaces related to roadways, driveways and parking areas tend to produce hydrocarbon pollutants and heavy metals. Where stormwater is piped directly to the waterbody, vegetative functions are ineffective at addressing water quality.

Data Indicators: Tidal wetlands, riparian vegetation, impervious surfaces, dikes, armoring, 303(d) listings, outfalls (comprehensive stormwater outfall data is not available)

Habitat Functions

Physical space and conditions for life history; Food production and delivery	Riparian habitats, including forested and tidal wetland vegetation communities are important for breeding, foraging, and rearing of many terrestrial and aquatic species. Continuous riparian vegetation provides a dispersal corridor for animals using riparian habitats. Larger and wider riparian and wetland areas tend to have more complex vegetation communities and more habitat types.
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Land use impacts: Vegetation removal and wetland fill or isolation limit habitat functions. Roads and upland development limit lateral habitat connectivity. Dams, tide gates, and culverts can interrupt habitat connectivity by presenting fish passage barriers or gaps in migratory corridors. Shoreline armoring tends to truncate the intertidal area. Overwater structures shade areas of submerged aquatic vegetation and create abrupt light transitions that can alter habitat use by local species assemblages.

Data Indicators: PHS occurrence, armoring/levees, overwater structures, roads, vegetation, wetlands, dams, fish passage barriers, tide gates

The information gathered as part of the shoreline inventory was used to characterize the reaches in terms of functions. Assessment of function was based upon both quantitative data results derived from GIS analysis, as well as qualitative assessment of reach conditions based on aerial photos.

5.1.1 Limitations

The ecological characterization results are intended to complement the inventory information in Chapters 3 and 4. This evaluation was limited by the quality and availability of inventory data. Therefore, limitations presented in Table 4-1 also apply to this evaluation.

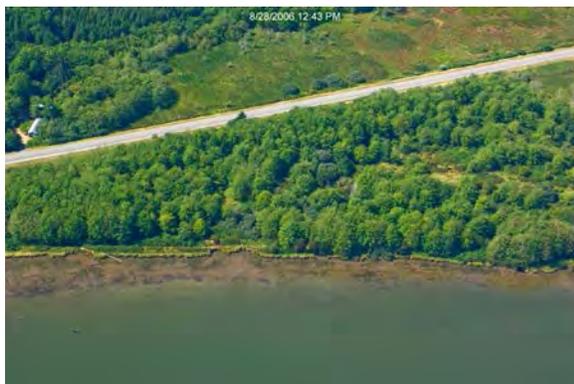
5.2 Results

The following tables describe existing reach characteristics and the major land use factors influencing present conditions within each reach. All photographs in the following section are from Ecology's Shoreline Photos (electronic reference (b)).

Table 5-2. Willapa River Reach 1.

Process	Function	Notes
Hydrologic	Moderation of sediment transport	Highway 101 roughly parallels the shoreline and acts as a levee, limiting the extent of tidal connectivity to the south. Shoreline-associated wetlands extend southeast of the highway, but tidal influence is limited by the road. The reach does not include any shoreline armoring or overwater structures; however, several derelict piles are located in the Willapa River near the southeastern portion of the reach.
	Development and maintenance of habitat features	
	Attenuating flow energy	
Vegetation	LWD and organic matter recruitment	This reach includes the area with the greatest forested riparian coverage within the City. Riparian forested vegetation ranges from approximately 200 to 1,000 feet in width. An extensive tidal wetlands associated with the mouth of Potter Slough is located north of the OHWM.
	Filtration of upland inputs	
	Bank stabilization	
Habitat	Wetland/riparian habitat	The shoreline frontage is owned and managed by WDFW for wildlife habitat. Riparian forested vegetation and tidal wetlands provide diverse habitat opportunities for waterfowl and salmonids.
	Space and conditions supporting fish and wildlife, including PHS species	
Hyporheic	Water storage, cool water refugia, and filtration	Tidal wetlands provide water storage and vegetative support.
	Support of vegetation	

Key Environmental or Land Use Factors Affecting Processes/Functions: Forested riparian and tidal wetland areas provide productive shoreline habitats. Highway 101 limits hydrologic connectivity to the south.



Forested area in WDFW ownership.



Tidal wetland at Potter Slough on the western edge of the City.

Table 5-3. Willapa River Reach 2.

Process	Function	Notes
Hydrologic	Moderation of sediment transport	Although not mapped, the majority of the shoreline is armored with riprap, and several derelict piles are located along the Willapa River at the northwestern and southeastern ends of the reach.
	Development and maintenance of habitat features	
	Attenuating flow energy	
Vegetation	LWD and organic matter recruitment	Riparian vegetation in the southern portion of the reach consists of a narrow band (approximately 20 feet) of shrubs. Riparian vegetation at the Ron Craig Boat Launch is predominantly mowed lawn. The vegetation likely provides some level of filtration, but does not contribute significantly to LWD or organic matter recruitment.
	Filtration of upland inputs	
	Bank stabilization	
Habitat	Wetland/riparian habitat	Highway 101 runs parallel to the reach, limiting lateral upland habitat connectivity. A small strip of wetland is present along the highway. Given its small size and degraded buffer, this wetland provides limited habitat benefit.
	Space and conditions supporting fish and wildlife, including PHS species	
Hyporheic	Water storage, cool water refugia, and filtration	Given the limited area between Highway 101 and the shoreline, hyporheic activity is not expected to play a major role in this reach.
	Support of vegetation	

Key Environmental or Land Use Factors Affecting Processes/Functions: The northern portion of the reach includes the Ron Craig Boat Launch with a boat launch and public pier. The mouth of Mill Creek is located just south of that location.



Ron Craig Boat Launch with boat ramp, dock, and parking area.



Highway 101 and riprap bank armoring.

Table 5-4. Willapa River Reach 3.

Process	Function	Notes
Hydrologic	Moderation of sediment transport	Most parcels are armored by riprap or vertical bulkheads, and many structures are built on piles over the water. Highway 101 runs adjacent to the shoreline for approximately 850 feet. Recent evidence of bank failure and localized scour is present in this area. The Washington Department of Transportation proposed using dolos (concrete blocks with a complex geometric shape) to protect the road while minimizing instream habitat impacts (Mcguire 2011). A timeline has not been established for repairing and protecting the road (Creative Community Solutions 2013).
	Development and maintenance of habitat features	
	Attenuating flow energy	
Vegetation	LWD and organic matter recruitment	The reach is mostly developed, and riparian vegetation is limited to absent.
	Filtration of upland inputs	
	Bank stabilization	
Habitat	Wetland/riparian habitat	Overwater structures associated with Coast Seafoods' and South Bend Products' seafood processing uses, as well as the City's public pier, are predominant features along the shoreline. These structures, combined with shoreline armoring, limit the habitat value of the reach for fish. Upland habitat is similarly limited by the lack of vegetated corridors.
	Space and conditions supporting fish and wildlife, including PHS species	
Hyporheic	Water storage, cool water refugia, and filtration	Armoring in this reach limits potential hyporheic functions.
	Support of vegetation	

Key Environmental or Land Use Factors Affecting Processes/Functions: Reach 3 includes the City's developed commercial waterfront; shoreline functions are generally impaired as a result of shoreline development.



Shoreline development and overwater structures.



Portion of Highway 101 that is experiencing bank scour and is subject to future repair.

Table 5-5. Willapa River Reach 4.

Process	Function	Notes
Hydrologic	Moderation of sediment transport	The East Point Seafoods facility includes two piers, and much of the facility is located overwater. Armoring is not mapped within this reach. Many derelict piles and structures are located along the shoreline, although a large derelict pier was removed from the shoreline in 2013.
	Development and maintenance of habitat features	
	Attenuating flow energy	
Vegetation	LWD and organic matter recruitment	Riparian vegetation consists of trees and shrubs and typically ranges from 60 to 100 feet in width.
	Filtration of upland inputs	
	Bank stabilization	
Habitat	Wetland/riparian habitat	Overwater structures limit the habitat value of the reach for fish; however, unarmored, vegetated shorelines provide some functions. Upland habitat is limited by the lack of vegetated corridors.
	Space and conditions supporting fish and wildlife, including PHS species	
Hyporheic	Water storage, cool water refugia, and filtration	The shoreline lacks complexity that would contribute to hyporheic activity.
	Support of vegetation	

Key Environmental or Land Use Factors Affecting Processes/Functions: Upland uses in this reach include seafood processing and marine building facilities. According to the County Assessor, the former lumber yard in the northern portion of the reach is vacant land owned by the County.



Light industrial uses along the Willapa River.



Area identified as County-owned, vacant property.

Table 5-6. Willapa River Reach 5.

Process	Function	Notes
Hydrologic	Moderation of sediment transport	The dike road restricts full connectivity between the Willapa River and the tidal marsh complex to the northwest; however a tidal connection further northwest in unincorporated Pacific County maintains the tidal influence of the marsh.
	Development and maintenance of habitat features	
	Attenuating flow energy	
Vegetation	LWD and organic matter recruitment	The tidal marsh on the northwestern side of the shorelands in this reach provide an expansive area of vegetative productivity. Vegetative functions are limited along the southern (Willapa River) side of the dike.
	Filtration of upland inputs	
	Bank stabilization	
Habitat	Wetland/riparian habitat	The tidal wetlands are continuous with a large tidal complex that connects with the Willapa River to the northwest. Given the small size of the individual channels within the City's tidal marsh area, tidal access by salmonids may be limited to the highest tides; however, the tidal marsh area still provides significant export of organic detritus and nutrient filtration functions. The tidal marsh area also provides foraging and nesting habitats for waterfowl.
	Space and conditions supporting fish and wildlife, including PHS species	
Hyporheic	Water storage, cool water refugia, and filtration	The tidal marsh system is expected to provide water storage and support of hyporheic functions.
	Support of vegetation	

Key Environmental or Land Use Factors Affecting Processes/Functions: This reach comprises undeveloped tidal wetlands and upland areas associated with the former WWTP detention ponds. No other development is noted within the reach.



Former South Bend sewer detention ponds.



Salt marsh area and dike on the north side of the Willapa River.

Table 5-7. Skidmore Slough Reach 1.

Process	Function	Notes
Hydrologic	Moderation of sediment transport	Two berms with tide gates located in Raymond restrict tidal influence and hydraulic connectivity in Skidmore Slough. No armoring or overwater structures are present in this reach.
	Development and maintenance of habitat features	
	Attenuating flow energy	
Vegetation	LWD and organic matter recruitment	Riparian vegetation consists of patchy trees and shrubs, frequently backed by mowed lawn. A small forested wetland is located north of the slough and south of Highway 101.
	Filtration of upland inputs	
	Bank stabilization	
Habitat	Wetland/riparian habitat	In 2009, restoration projects improved fish passage at the tide gates in Raymond. The small forested wetland provides habitat for small mammals and birds.
	Space and conditions supporting fish and wildlife, including PHS species	
Hyporheic	Water storage, cool water refugia, and filtration	Hyporheic functions are expected to be limited in this reach as a result of the lack of natural tidal connectivity.
	Support of vegetation	

Key Environmental or Land Use Factors Affecting Processes/Functions: The lack of tidal influence associated with the tide gates in Raymond are the major factor affecting shoreline functions in this reach. Clearing of riparian vegetation associated with upland shoreline residential and light intensity industrial uses also limit functions.



Shoreline residential and vacant lands along Skidmore Slough.



Shoreline residential and vacant lands on the west side of Skidmore Slough.

Table 5-8. Skidmore Slough Reach 2.

Process	Function	Notes
Hydrologic	Moderation of sediment transport	Two berms with tide gates located in Raymond restrict tidal influence and hydraulic connectivity in Skidmore Slough. No armoring or overwater structures are present in this reach.
	Development and maintenance of habitat features	
	Attenuating flow energy	
Vegetation	LWD and organic matter recruitment	Prior to the installation of tide gates at the mouth of Skidmore Slough, these lands were likely part of a tidal marsh complex. Today, the area is a mowed field with approximately 20-foot-wide bands of shrubby vegetation along the remaining sloughs.
	Filtration of upland inputs	
	Bank stabilization	
Habitat	Wetland/riparian habitat	A restoration project completed in 2009 replaced blocking culverts with a 70-foot-wide bridge under South Bend-Raymond Road. Tide gates at the mouth of the slough were also replaced to improve fish passage. In 2004, the Sportsmen's National Land Trust received a State grant to acquire and conserve 80 acres of wetland habitat in South Bend and unincorporated Pacific County, with future plans to accommodate tidal reconnection of the slough.
	Space and conditions supporting fish and wildlife, including PHS species	
Hyporheic	Water storage, cool water refugia, and filtration	Hyporheic functions are likely limited in this reach as a result of the lack of natural tidal connectivity.
	Support of vegetation	

Key Environmental or Land Use Factors Affecting Processes/Functions: Undeveloped lands east of the slough are owned by the Port of Willapa Harbor and managed as mowed fields. Wetlands in the southern portion of the reach have been conserved.



Port of Willapa Harbor-owned undeveloped property.



Scrub-shrub and forested wetland area in the southern portion of the reach.

5.3 Restoration Opportunities

Potential voluntary habitat restoration opportunities focus on restoring tidal processes and allowing for movement and migration of fish and wildlife. Such improvements may also improve the system's resistance and resilience to changes and disturbances in the environment (Greiner 2010). Although habitat protection does not necessarily restore processes or functions, habitat protection through acquisition can be an important step toward facilitating future restoration or ensuring that key processes are maintained. General opportunities for habitat restoration within the City's shorelines include the following:

- Removal of derelict piles and in-water structures;
- Continued monitoring and control of *Spartina*;
- Use of stabilization alternatives that integrate shoreline complexity, or removal of stabilization where feasible;
- Restoration of tidal influence in Skidmore Slough (tide gates located in Raymond); and
- Riparian vegetation enhancement along the City's publicly-owned shoreline parcels.

The City's Draft Comprehensive Plan (City of South Bend 2014) includes several policies that either directly or indirectly address restoration and voluntary protection of ecological functions. These include the following:

- Prepare a study that explores restoring the former South Bend sewer lagoon as a wetland/fish and wildlife habitat mitigation-banking site (7.11 & 11.2 of the Draft Comprehensive Plan). [Note that a mitigation site is intended to maintain (rather than restore) ecological functions within the broader service area of the bank; however, a net gain in ecological functions could be expected locally as a result of the mitigation bank].
- Prepare a stormwater management plan that analyzes stormwater runoff and flooding issues, develops a general stormwater conveyance plan, and identifies projects and programs, including measures for protecting water quality (11.3 of the Draft Comprehensive Plan).
- Encourage the retention of properties under public and nonprofit ownership with intact natural vegetation as open space. Key focus areas include lands northwest of the Ron Craig Boat Launch, Old Mill Pond, and City-owned properties along the Willapa River (6.2 of the Draft Comprehensive Plan).

Additionally, three TMDLs have been established for the Lower Willapa River. These TMDLs address dissolved oxygen, instream temperatures and bacteria levels in the Lower Willapa River. The City has made a major step in implementing the TMDL for dissolved oxygen by decommissioning its WWTP and partnering with Raymond to develop a regional WWTP. Continued implementation of activities identified in the TMDL Water Quality Improvement Implementation Plans will help improve water quality within the City and the surrounding areas.

Additionally, shoreline restoration and enhancement projects that occur upstream and downstream from the City may help to improve shoreline processes and functions within the City.

6 LAND USE ANALYSIS

6.1 Overview

The City's shoreline jurisdiction represents 192 upland acres and approximately 7.3 shoreline miles. Major land uses in the City's shoreline jurisdiction, as identified by the Pacific County Assessor, include Government/Institutional (56 percent), Vacant/Undeveloped (11 percent), Residential (9 percent), and Forestry (7 percent). Agriculture, Commercial, Quasi Public, and Manufacturing/Industrial uses represent small portions of the land. South Bend generally has a low development density. The City features two parks, two boat launches, and one marina that offer public access to the Willapa River. Figure 6-1 summarizes the current land uses in South Bend's shoreline jurisdiction by acreage.

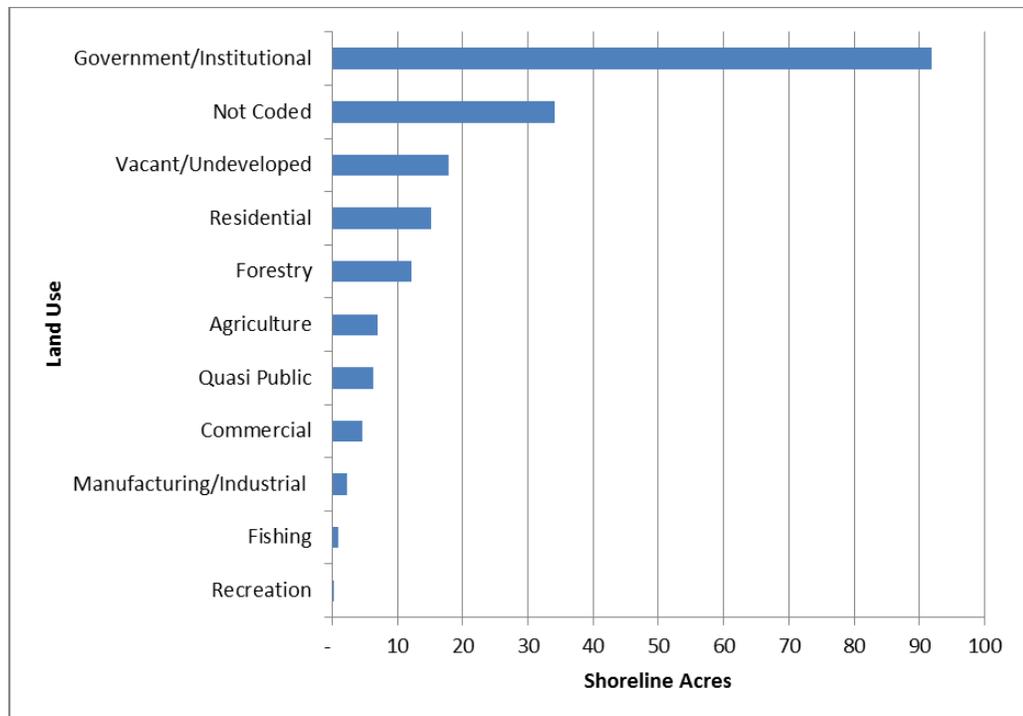


Figure 6-1. Current shoreline land use by acreage.
(Source: Pacific County 2014, TWC 2014, BERK 2014)

6.2 Approach

6.2.1 Shoreline Land Use

Existing and Future Land Use

This chapter reviews current land use and potential new use by looking at Pacific County Assessor (Assessor) data, City zoning and comprehensive plan land designations, land ownership, and existing shoreline environment designations.

Existing land use provides a baseline for types of land use and land use patterns found within shoreline jurisdiction. Existing land use data was obtained from the Assessor and then overlaid on City’s shoreline jurisdiction. The Assessor designates a land use code, established in WAC 458-53-030, for each parcel in the County, including parcels within South Bend. The codes were rolled up into the following broad categories.

- Agriculture
- Commercial
- Forestry
- Government/Institutional

- Manufacturing/Industrial
- Quasi-Public
- Recreation
- Residential
- Utilities
- Vacant/Undeveloped
- Others
- Not Coded

Use of the Assessor's data requires a certain level of interpretation when using it for describing and analyzing land use. As noted above, because the primary purpose of Assessors' data is to assess property taxes, the Assessor does not collect data on publically owned and non-profit uses that are exempt from property taxes. These uses and lands are coded as "exempt." For this analysis, ownership data was used to identify the land use as much as possible. Therefore, the following land use categories were used to differentiate those exempt lands.

- Government/Institutional (GI) refers to lands that are owned by a government or tribe
- Quasi-Public (QP) refers to lands that were identified as churches, cemeteries, the Audubon Society, or fraternities

Zoning and Shoreline Environment Designations

Zoning and shoreline environment designations are reported for lands and properties within the City's shoreline jurisdiction. Both of these regulatory tools establish the types of uses allowed and provide development standards to regulate development. These data provide information in the types of development that can be expected under current regulations.

Ownership Profile

The ownership profile in the City of South Bend is varied. Understanding shoreline land ownership helps identify the types of uses and developments that can be expected to occur in those shorelines. The general ownership profile is reported for the shoreline reaches within the City.

Water-oriented Uses

According to the Guidelines (WAC 173-26-020), "water-oriented use means a use that is water-dependent, water-related, or water-enjoyment, or a combination of such uses." The SMA promotes uses that are "unique to or dependent upon use of the State's shoreline," as well as "ports, shoreline recreational uses including but not limited to parks, marinas, piers, and other

improvements facilitating public access to Shorelines of the State, industrial and commercial developments which are particularly dependent on their location on or use of the Shorelines of the State and other development that will provide an opportunity for substantial numbers of the people to enjoy the Shorelines of the State” (RCW 90.58.020). Definitions and examples of water-oriented uses are included in Table 6-1 below. Water-oriented uses are reported for each of the City’s waterbodies.

Table 6-1. Water-oriented uses definitions and examples.

Water-oriented Use Definitions	Examples
<p>"Water-dependent use" means a use or portion of a use which cannot exist in a location that is not adjacent to the water and which is dependent on the water by reason of the intrinsic nature of its operations. (WAC 173-26-020(39))</p>	<p>Examples of water-dependent uses may include ship cargo terminal loading areas, ferry and passenger terminals, barge loading facilities, ship building and dry docking, marinas, aquaculture, and sewer outfalls.</p>
<p>"Water-related use" means a use or portion of a use which is not intrinsically dependent on a waterfront location but whose economic viability is dependent upon a waterfront location because:</p> <p>(a) The use has a functional requirement for a waterfront location such as the arrival or shipment of materials by water or the need for large quantities of water; or</p> <p>(b) The use provides a necessary service supportive of the water-dependent uses and the proximity of the use to its customers makes its services less expensive and/or more convenient. (WAC 173-26-020(43))</p>	<p>Examples of water-related uses may include warehousing of goods transported by water, seafood processing plants, hydroelectric generating plants, gravel storage when transported by barge, oil refineries where transport is by tanker, log storage, and potentially agriculture and agriculturally related water transportation systems.</p>
<p>"Water-enjoyment use" means a recreational use or other use that facilitates public access to the shoreline as a primary characteristic of the use; or a use that provides for recreational use or aesthetic enjoyment of the shoreline for a substantial number of people as a general characteristic of the use and which through location, design, and operation ensures the public’s ability to enjoy the physical and aesthetic qualities of the shoreline. In order to qualify as a water-enjoyment use, the use must be open to the general public and the shoreline-oriented space within the project must be devoted to the specific aspects of the use that fosters shoreline enjoyment. (WAC 173-26-020(40))</p>	<p>Primary water-enjoyment uses may include, but are not limited to, parks, piers and other improvements facilitating public access to the shorelines of the State; and general water-enjoyment uses may include, but are not limited to restaurants, museums, aquariums, scientific/ecological reserves, and resorts/hotels (as part of mixed-use development or with significant public access or restoration components), and commercial/office as part of a mixed-use development.</p>

6.2.2 Transportation and Utilities

Transportation and utility infrastructure is often placed parallel, crossing, or in close proximity to shorelines. All known transportation infrastructure including roads, bridges, and trails that are located in shoreline jurisdiction are identified and described for each waterbody. Utility infrastructure such as water, wastewater, electrical, communication, and other facilities are

found throughout the City. However, data on utilities is limited. Where available, utility infrastructure within the shoreline is reported.

6.2.3 Existing and Potential Public Access

Information about South Bend's shoreline public access facilities and potential opportunities was obtained from a review of public parks, federal and State lands, public access points, City materials, and aerial images. The analysis of public access does not account for public access (either physical or visual) from private lands (e.g. community clubs, restaurants, hotels).

6.2.4 Developing Shorelines and New Uses

The Guidelines require that jurisdictions preparing SMP updates conduct an analysis to estimate the future demand for shoreline space (WAC173-26-201(3)(D)). This report draws on several sources of information as a means of understanding potential new shoreline development and uses.

Vacant shoreline properties are likely locations for new developments and uses. Therefore, the zoning of lands classified as vacant or undeveloped by the Assessor were identified for each reach. For those vacant lands with residential zoning that are partially or wholly within shoreline jurisdiction, capacity for new housing development was estimated. It is important to note that this gives a broad measure of capacity, but not a likelihood that development will occur.

Two methods were used to assess the likelihood and magnitude of new development. The first was a review of the City's population and dwelling unit forecasts and land capacity analysis from the County's Comprehensive Plan. Consistent with GMA, the County prepared these for the incorporated cities. The second method to assess the pace of future growth included a review of past population trends in the County. The Washington State Office of Financial Management (OFM) provides estimates of intercensal population and housing units for each City. Lastly, City staff were contacted and asked to identify anticipated or potential new developments or uses in the shoreline.

6.2.5 Historical or Archaeological Sites

The Willapa people historically occupied the Willapa River Valley. Given their presence in the area over several thousand years and the use of shorelines for sustenance and spiritual practices, archaeological features are expected to be present along the City's shorelines. Due to the wealth of cultural resources, the State of Washington Department of Archaeology and Historic Preservation requires cultural resource assessments when development or activities are proposed that may affect archaeological or historic resources.

As described in Section 3.5, the South Bend WWTP is nonoperational and a decommissioning project began in 2014. This project underwent a permitting process, including an archaeological investigation. According to the WWTP archaeological investigation, conducted by Robert Freed of Archaeological Consulting Services in 2014, no archaeological materials were identified and no further investigations were recommended. The report did note the historical presence of an Indian village between the present-day cities of South Bend and Raymond. The report also noted previous studies in and around the City of South Bend, which identified fish weirs and other artifacts dating back 230-700 years (Freed 2014). Other recent studies along the developed shoreline of the City of South Bend noted that the shoreline was filled with dredge material, which did not include archaeological resources (Freed 2014).

6.3 Results by Waterbody

6.3.1 Willapa River

The Willapa River shoreline jurisdiction in the City includes 137 acres (upland of the OHWM) along just over five miles of shoreline.

Shoreline Land Use

Existing and Future Land Use

Development in the City is concentrated on the southern bank of the river. The Willapa River's southern shore is developed with mostly commercial and residential uses. The northern shoreline contains the City's former WWTP. The rest of the land on the north shore of the Willapa River in South Bend is undeveloped.

Along the shoreline, land ownership is a mix of public and private. The shoreline to the west of the Ron Craig Boat Launch, which is owned and managed by WDFW, is undeveloped. Further east towards downtown, parcels along the shore are mainly under private ownership and include a notable presence of the seafood industry. On the eastern stretch of the Willapa River is a large tract of land owned by the County.

Generally, the Willapa River's 137 acres of shoreline land are classified as Government/Institutional (59 percent), Forestry (8 percent) and Vacant/Undeveloped (7 percent). Agriculture, Commercial, and Residential uses make up smaller portions of South Bend's shoreline (6, 4, and 3 percent, respectively). The large amount of public land is under the ownership of local, County, and State entities. Figure 6-2 below shows the current land uses of shoreline lands along the Willapa River by acreage.

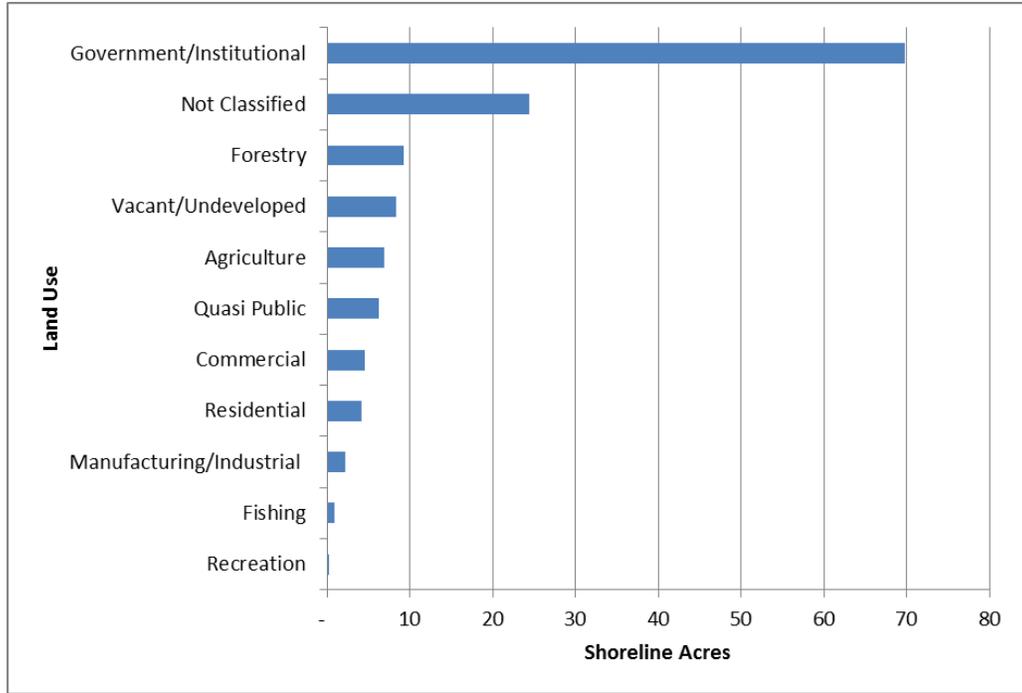


Figure 6-2. Current land use by acreage - Willapa River shorelines.
(Source: Pacific County 2014, TWC 2014, BERK 2014)

Please see Table 4-4 for a summary of current land use, zoning, comprehensive plan, and current shoreline environment designations for each of the five Willapa River shoreline reaches. Notably, the Comprehensive Plan designates environmental protection areas in Willapa River Reaches 1 and 2 as well as a Waterfront Overlay District in Willapa River Reaches 3 and 4.

Water-oriented Uses

South Bend historically had numerous water-dependent uses along the Willapa River associated with commercial shellfish and fishing. According to the City’s Background Information Report for the Comprehensive Plan Development Process (2013), the South Bend economy depends heavily on the oyster aquaculture industry. There are three seafood producers in South Bend, all with facilities located on the Willapa River. These would all be considered water-dependent uses. East Point Seafood is located in Willapa River Reach 4. South Bend Products and Coast Seafoods Company are located in Willapa River Reach 3. Of these, the Coast Seafoods Company plant is the largest, occupying 2.6 acres. All three of these processors include warehouses, docks and other overwater structures within shoreline jurisdiction.

A few other commercial uses are water-oriented. The South Bend Boat Shop west of South Bend Products would be considered a water-related use. There are several cafés and restaurants that

offer customers seating with views of the shorelines and water. There are considered water-enjoyment uses.

The City's former WWTP (decommissioned in 2014), located on north shore of the Willapa River (Willapa River Reach 5), was considered a water-related use while in operation. The City of South Bend entered into an intergovernmental agreement with the City of Raymond in 2008 to construct a new regional facility located in Raymond. The new facility went on-line at the beginning of 2013. Wastewater outfalls and other utility outfalls are considered water-dependent uses.

Water-oriented uses also include the City's public access sites, which include public parks, trails, viewpoints, docks, and boat launches. These sites are described in more detail below under Public Access.

6.3.2 Skidmore Slough

Skidmore Slough shoreline jurisdiction in the City includes 55 acres (upland of the OHWM) along just over 2.1 miles of shoreline.

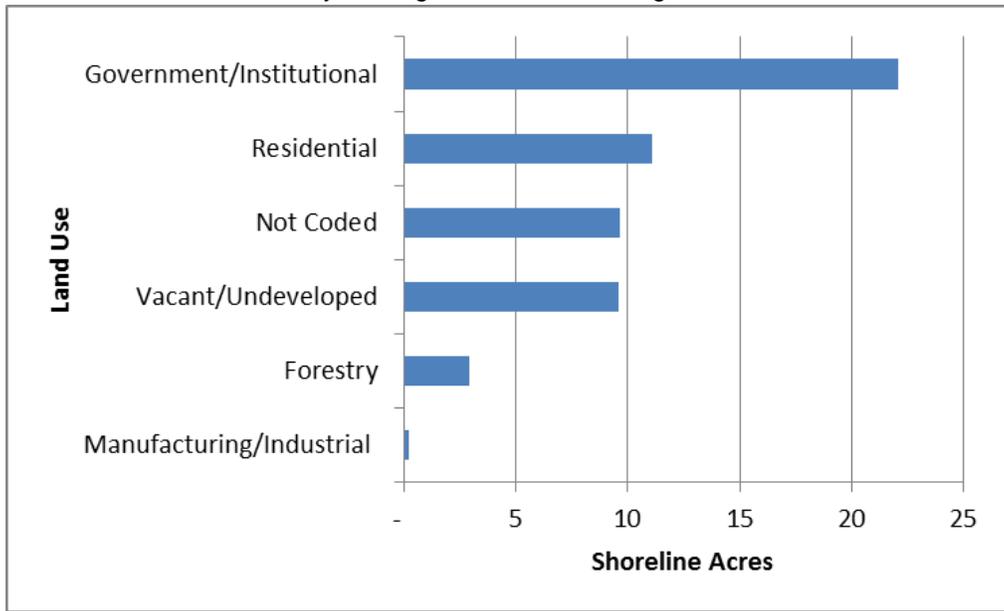
Shoreline Land Use

Existing and Future Land Use

Outside of the publically owned property, which is 40% of the Skidmore Slough, a good portion (20%) of the land surrounding the slough is low-density residential. The developed low-density residential area is on the western side of the slough. A large undeveloped tract of 27 acres on the eastern side of Skidmore Slough is owned by the Port of Willapa Harbor and is designated as open space. The shoreline jurisdiction for the Skidmore Slough also crosses a small portion of Highway 101 and the Willapa Hills Trail.

Generally, Skidmore Slough's shoreline lands are classified as Public (40 percent), Residential (40 percent), and Vacant/Undeveloped (17 percent). Forestry and Manufacturing/Industrial make up a small portion of South Bend's shoreline (5 percent and less than 1 percent, respectively). Figure 6-3 shows the current land uses of shoreline lands along Skidmore Slough using the land use codes provided by the Assessor.

Figure 6-3. Current land uses by acreage - Skidmore Slough shorelines.



(Source: Pacific County 2014, TWC 2014, BERK 2014)

Please see Table 4-4 for a summary of current land use, zoning, comprehensive plan, and current shoreline environment designations for each of the two Skidmore Slough shoreline reaches. Notably, Skidmore Slough Reach 2 has a significant portion (41 percent) dedicated to environmental protection in the comprehensive plan. Also of note, a large majority of shoreline jurisdiction lands within Skidmore Slough are outside existing zoning designations. The City is currently undergoing a comprehensive plan update process, during which these unzoned lands will likely be placed into an Environmental Protection District, which allows conservation, forestry, and agriculture.

Water-Oriented Uses

The only water-oriented use identified in the Skidmore Slough shoreline in South Bend is the Willapa Hills Trail, described below under Public Access.

6.4 Citywide Results

6.4.1 Public Access

Existing Public Access

Table 6-2 summarizes public access options in the City of South Bend.

Table 6-2. Summary of shoreline public access.
 (Source: Pacific County, 2014; TWC, 2014; BERK, 2014)

Shoreline Reach	Parks	Pier	Trail (Linear Feet)	Boat Launches	Marina
Skidmore Slough Reach 1	--	--	595	--	--
Skidmore Slough Reach 2	--	--	--	--	--
Willapa River Reach 1	--	--	--	--	--
Willapa River Reach 2	1	--	--	1	--
Willapa River Reach 3	1	--	--	1	1
Willapa River Reach 4	--	--	--	--	--
Willapa River Reach 5	--	--	--	--	--

The following shoreline public access sites and trails are located within South Bend’s shoreline jurisdiction.

- **Willapa Hills Trail** is a Washington State Parks-operated trail that runs 56 miles from Chehalis to South Bend, following the old Northern Pacific Railroad right-of-way. The South Bend terminus of the trail is at Old Mill Pond. It is a paved trail through South Bend, sharing a portion of its route with Highway 101. Excluding those portions of the trail that are part of Highway 101, approximately 595 feet of the Willapa Hills Trail falls within Skidmore Slough Reach 1.
- **South Bend Ron Craig Boat Launch** is located in Willapa River Reach 2, with a launch area of approximately three quarters of an acre. There are two picnic tables, parking, and a portable toilet facility. The May 2014 Draft Comprehensive Plan identifies the construction of public restroom facilities at this access point as a priority project.
- **Ray Spurrell Boardwalk and South Bend Boat Docks.** Where Willapa Avenue meets Highway 101, a boat launch, dock, one-third of an acre of park space, and restroom facilities are available for public use. There is an 88-foot pier that leads to the 380-foot dock located 30 feet off the shore. The dock provides water and electrical hookups. This facility is located in Willapa River Reach 3.

Future Public Access

South Bend’s 2011-2017 Comprehensive Park Plan (Park Plan) identifies objectives for future public access and public access improvements, with some of the projects located in shoreline jurisdiction.

- **South Bend Wetland Trails Park** is a project that will be partially located in Willapa River Reach 2. The park will include a nature trail on 125 acres of WDFW wetlands.

The design of this project has been completed and it will be implemented through a partnership with Willapa Bay Regional Fisheries Enhancement Group.

- **Willapa Hills Trail State Park Restrooms and Extension** is a project that will improve upon this existing public access amenity. The South Bend Draft Comprehensive Plan and the Park Plan identify the Willapa Hills Trail Extension as a priority project. This project would extend the trail through a partnership with State Department of Transportation and Washington State Parks.
- The **Spurrell Dock Canopy** project will construct a canopy over certain areas of the Spurrell Dock, making it a year-round public space and market venue. The Park Plan identifies this as a location where farm produce, fresh flowers, seafood, arts, and food vendors can sell their products.

6.4.2 Transportation and Utilities

Transportation infrastructure within the shoreline of South Bend is limited. Table 6-3 summarizes South Bend’s transportation infrastructure, the majority of which is in the form of vehicular roadways. In addition to land-based transportation, overwater structures provide necessary infrastructure for water-based transportation.

Table 6-3. Transportation infrastructure summary.
(Source: Pacific County 2014, TWC 2014, BERK 2014)

Lake/Reach	Roads (miles)	Bridges	Rail (linear feet)
Skidmore Slough Reach 1	0.44	--	--
Skidmore Slough Reach 2	0.35	--	--
Willapa River Reach 1	0	--	--
Willapa River Reach 2	0.28	--	--
Willapa River Reach 3	0.98	--	--
Willapa River Reach 4	0	--	--
Willapa River Reach 5	0	--	--

There is about three quarters of a mile of roadway in the Skidmore Slough shoreline jurisdiction and about one and a quarter miles of roads in the Willapa River shoreline jurisdiction, reflecting an approximate total of 2.05 miles in South Bend’s shoreline jurisdiction. There is one major road (Highway 101, locally called Robert Bush Drive, which runs through downtown along the Willapa River), with some minor collectors joining it.

There are no bridges within the South Bend shoreline jurisdiction.

A former rail line that ran through South Bend has been converted to a recreation trail for walking and cycling, the Willapa Hills Trail. The trail leaves its path and runs along Highway 101 as its route through downtown South Bend.

South Bend's historic regional timber, fishing, and aquaculture industries resulted in the use of overwater structures along the Willapa River. Presently, two seafood processing plants in South Bend (Hilton's Coast Seafoods Company and Dungeness Development Associates) process fish and shellfish off of boats transporting the product along the Willapa River. A public dock runs along the Willapa River in downtown South Bend. Many sportfishing boaters use the launch located on US 101 just outside of South Bend's downtown.

In 2011, the City of South Bend began the process of building a new regional WWTP through a joint partnership with the City of Raymond, to be located in Raymond. The regional option was found to be the lowest cost alternative both for capital and operating budgets, and will solve deficiencies in both cities' systems. The regional facility upgrades include new pipelines, pump station improvements, and a mechanical activated sludge plant. The new facility was completed in 2013.

As part of the City's Draft Comprehensive Plan, a stormwater system project is proposed as a way of fulfilling the plan's land use goals. This project could positively impact the shoreline. The City's Public Facilities & Services Element goals and policies related to shorelines include the following:

- **GOAL 11:** Identify capital expenditure priorities for those public facilities and services necessary for implementing the Land Use Element over the 20-year planning period.
 - **Policy 11.3:** Prepare a stormwater management plan that analyzes stormwater runoff and flooding issues, develops a general stormwater conveyance plan, and identifies projects and programs, including measures for protecting water quality.

6.4.3 Developing Shoreline and New Uses

The Guidelines require that jurisdictions preparing SMP updates conduct an analysis to estimate the future demand for shoreline space (WAC173-26-201(3)(D)). This report draws on several sources of information as a means of understanding potential new shoreline development and uses.

New shoreline developments and new shoreline uses will locate on vacant lands or represent redevelopment or expansion on previously developed land. To address the former, the zoning

of lands classified as vacant or undeveloped by the Assessor was reviewed to broadly assess the relative development capacity of the shoreline jurisdiction within each reach.

Within South Bend, there are 193 undeveloped or vacant parcels that are either wholly within or partially within shoreline jurisdiction representing 146 acres of land. Table 6-4 below lists vacant parcels and acreage per reach by zoning designation.

Table 6-4. Vacant or undeveloped parcels within or partially within shoreline jurisdiction.
(Source: Pacific County 2014, TWC 2014, BERK 2014)

Shoreline Reach	Agriculture	Commercial	General Residential (R-2)	Residential Single Family (R-1)	Industrial	Not Coded	Total Acres (No.)
Willapa River Reach 1	-	6 (1)	-	-	-	-	6 (1)
Willapa River Reach 2	-	-	-	<1 (3)	-	-	< 1 (3)
Willapa River Reach 3	-	13 (67)	< 1 (2)	< 1(3)	-	-	14 (72)
Willapa River Reach 4	-	-	-	-	3 (4)	<1 (1)	3 (5)
Willapa River Reach 5	111 (6)	-	-	-	-	-	111 (6)
Skidmore Slough Reach 1	-	-	-	< 1 (6)	-	10 (53)	10 (59)
Skidmore Slough Reach 2	-	-	-	-	-	2 (47)	2 (47)
Total Acres (No.)	111 (6)	20 (68)	< 1 (2)	1 (12)	3 (4)	12 (101)	146 (193)

Another factor that influences the potential development of vacant shoreline parcels are population trends. Past population and employment trends in the City were analyzed to suggest the pace of future growth. The OFM provides annual estimates of population and housing units for each incorporated city.

With a population of 1,630 in 2013, South Bend is the second most populated city in Pacific County. During the 1990s, the City's population increased by 16.5 percent. However, overall between 1990 and 2013 the City experienced a marginal increase in population (0.05 percent). The average annual growth rate for South Bend between 1990 and 2013 has remained neutral at approximately 0.002 percent. The trend for housing units is consistent with population growth and reflects an average annual growth rate of 0.1 percent.

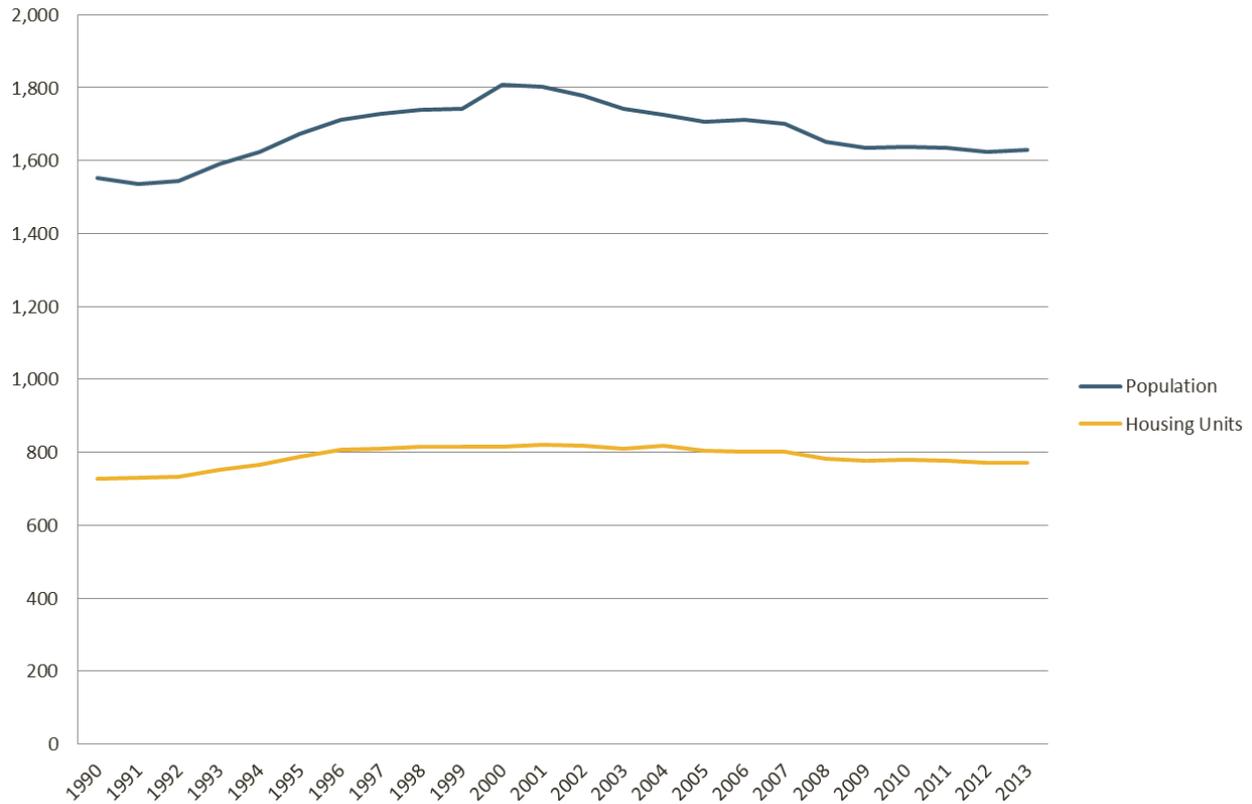


Figure 6-4 compares historical trends for population and housing units for South Bend from 1990 through 2013.

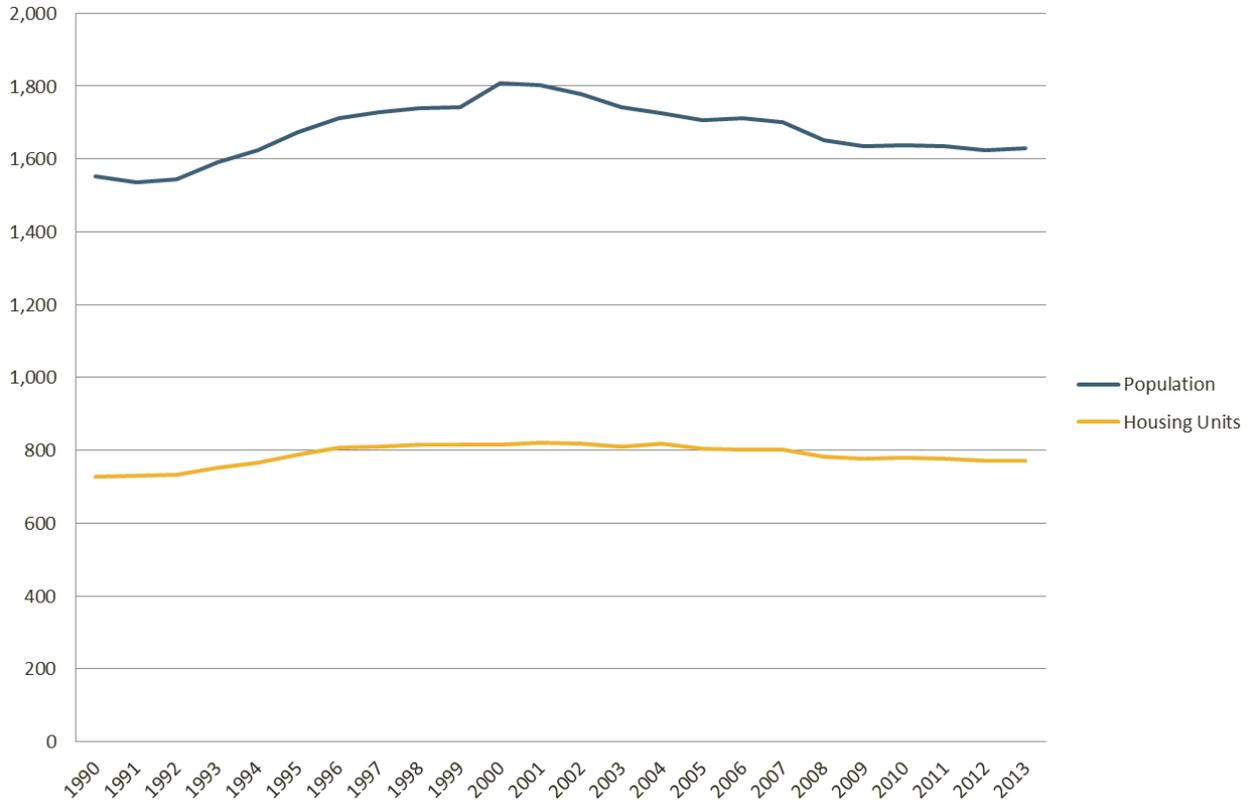


Figure 6-4. City of South Bend population and housing units 1990 to 2013.
 (Source: OFM 2014, BERK 2014)

Additionally, the City developed 2030 population forecasts as part of its current Comprehensive Plan effort in 2012. That plan forecast a population increase of 404 from 1,770 in 2009 to 2,174 in 2030. This would represent an annual growth rate of 0.01 percent, or 2.3 percent for the entire 20-year period. This number is nominally higher than the City’s average growth rate over the last 20 years. Overall, both housing and population within South Bend have remained constant both for its immediate past as well as its predicted near future.

As a result of both the amount of available vacant lands within jurisdiction and the general trends in growth, significant amounts of new residential development along South Bend’s shoreline is unlikely. Table 6-5 highlights the respective residential capacity for each reach both in terms of fully utilizing those parcels that are either partially or fully within shoreline jurisdiction as well as developing those portions of vacant parcels that are within shoreline jurisdiction. As shown, capacity for residential growth is negligible.

Table 6-5. Residential vacant and undeveloped parcels fully or partially within jurisdiction.
(Source: Pacific County 2014, TWC 2014, BERK 2014)

Shoreline Reach	Residential Vacant and Undeveloped Parcels – Acres (No.)					
	Vacant Parcels (No.)	Vacant Area Full Lot	Vacant Area (in Shoreline Jurisdiction)	Dwelling Units/ Acre	Potential Dwelling Units (Full Lot)	Potential Dwelling Units (in Shoreline Jurisdiction)
Willapa River Reach 2	3 (SF R-1)	0.21	0.03	5	0.04	0.01
Willapa River Reach 3	2 (GR R-2)	0.14	0.14	5	0.03	0.03
	3 (SF R-1)	0.20	0.07	5	0.04	0.01
Skidmore Slough Reach 1	6 (SF R-1)	0.41	0.23	5	0.08	0.05
Total	15	0.96	0.47	-	0.19	0.09

Note: Shoreline reaches that do not appear in this table do have any vacant shoreline parcels zoned for residential development.

Commercial and industrial vacant land capacity for increased development use is available within the City and represents 23 acres of vacant land. These lands can conceivably be developed for water-oriented uses in the future. Vacant agricultural lands represent 111 acres of vacant land. Their development potential is negligible as the majority of the zoned vacant agricultural lands consist of a large wetlands complex on the north shore of the Willapa River while the remaining portions zoned agricultural lands contain the former South Bend WWTP.

6.4.4 Historic and Archeological Sites

South Bend has 12 historic sites located within the shoreline jurisdiction of the Willapa River. Eleven of these sites are located in downtown South Bend within reach 3 of the Willapa River; the other site, the East Point Cannery, is located in reach 4 of the Willapa River. Table 6-6 provides a list of historic properties in South Bend.

Table 6-6. List of historic sites within shoreline jurisdiction.
(Source: Pacific County 2014, TWC 2014, BERK 2014)

Jurisdictional Waterbody	Historic Site Name	Historic Site Location
Willapa River Reach 3	Davis Drug Store	Robert Bush Drive, South Bend
	Bergen Building	424 W Robert Bush Drive, South Bend
	Charles Herman House	1500 Robert Bush Drive, South Bend

Jurisdictional Waterbody	Historic Site Name	Historic Site Location
	Charles Poage House	322 W Robert Bush Drive, South Bend
	First International Bank	911 Robert Bush Drive, South Bend
	Joe Shone Building	424 W Robert Bush Drive, South Bend
	Noonan Building	1110 Robert Bush Drive, South Bend
	Roessler's Store	922 West Robert Bush Drive, South Bend
	Semphill Drug Store	914 W Robert Bush Drive, South Bend
	Werley Block Building	710 West Robert Bush Drive and Memorial Drive, South Bend
	Willapa Harbor Iron Works	228 W Robert Bush Drive, South Bend
Willapa River Reach 4	East Point Cannery	400 Robert Bush Drive, South Bend

As noted above in Section 6.2.5, because of the tribal presence in the area over several thousand years and archaeological resources that have been identified in and adjacent to the City's shorelines, archaeological features are expected to be present.

7 SHORELINE MANAGEMENT RECOMMENDATIONS

This chapter discusses recommended actions for translating inventory and characterization findings into SMP policies, regulations and environment designations, as well as restoration strategies for areas within shoreline jurisdiction. In addition to these recommendations, the updated SMP should incorporate all other requirements of the SMA and the Guidelines.

7.1 Environment Designations

As outlined in WAC 173-26-191(1)(d), "shoreline management must address a wide range of physical conditions and development settings along shoreline areas. Effective shoreline management requires that the shoreline master program prescribe different sets of environmental protection measures, allowable use provisions, and development standards for each of these shoreline segments." In WAC 173-26-211(2)(a), the Guidelines further direct development and assignment of environment designations based on "existing use pattern, the biological and physical character of the shoreline, and the goals and aspirations of the community as expressed through comprehensive plans..."

There is substantial flexibility in the development of environment designation recommendations; however, the approach and rationale should be clearly documented. In general, the environment designation purpose and criteria statements should be used, in concert with the findings of this *Shoreline Analysis Report*, and includes the following information.

- Current land use
- Planned land use
- Ownership
- Wetlands
- Floodplains
- Vegetation
- Impervious surfaces

While current and future land use provide basic context for a given segment of land, environment designations should not be expected to always correlate strongly with these parameters, particularly on currently undeveloped shoreline areas and shoreline areas with extensive critical areas (e.g. wetlands). Further, parcels may extend beyond shoreline jurisdiction, such that while the current land use code may indicate a single-family residential use, the actual development may not be in shoreline jurisdiction and would therefore not necessarily result in adverse impacts to shoreline condition.

7.1.1 Recommendations

The following specific recommendations are provided for the development and assignment of environment designations in the City:

- The City should establish environment designations generally based on the five-environment classification system set forth by the Guidelines (note that a sixth environment, “Rural Conservancy,” is not intended to apply in incorporated areas). The City can deviate from this classification system if necessary to fit local conditions.
- Based on the findings of this report, use of the Natural designation in the City would be expected to be minimal, if used at all.
- Use the inventory and characterization findings in this report to inform assignment of environment designations.

7.2 General Policies and Regulations

Following are recommendations for general SMP policies and regulations.

7.2.1 Archaeological and Historic Resources

- The findings of this report do not suggest a need for additional regulations beyond those specified by the Guidelines.

7.2.2 Critical Areas

- Review the City's critical areas code to ensure that it meets current best available science requirements. Consider whether critical areas regulations should be incorporated into the SMP by direct inclusion, as an appendix, or by reference.
- Support the development or use of mitigation banking to offset unavoidable impacts to wetlands.

7.2.3 Flood Hazard Reduction

- Dikes are presently located in the City. Consistent with the WAC provisions in the Guidelines, the SMP should provide maximum flexibility for developing and maintaining flood hazard reduction measures as needed to continue protection of existing uses while also emphasizing the maintenance of existing ecological functions.
- Consider including incentives in the SMP to remove derelict flood hazard reduction structures, such as pile dikes.

7.2.4 Public Access

- Provide policies and regulations that recognize and facilitate implementation of existing parks, recreation, and open space plans.
- Provide public access, as feasible, in new commercial, industrial and multi-family development, as well as publicly sponsored or financed utility and flood control facilities.
- Promote visual access where physical access is not feasible.

7.2.5 Shoreline Vegetation Conservation

- Promote the retention of existing shoreline vegetation.
- Ensure that vegetation provisions accommodate preferred uses, particularly water-oriented uses and public access.

- Ensure that vegetation standards are clear regarding thinning, trimming and pruning of vegetation to maintain views and to minimize safety hazards.
- Ensure that vegetation standards allow for treatment and/or removal of invasive vegetation that poses a threat to shoreline ecological functions.

7.2.6 Water Quality, Stormwater, and Nonpoint Pollution

- Consider whether any specific regulations to address water quality, stormwater, and/or nonpoint pollution should apply in shoreline jurisdiction, in addition to other City regulations addressing these issues.

7.3 Shoreline Modification Provisions

Following are recommendations for SMP shoreline modification policies and regulations.

7.3.1 Shoreline Stabilization

- Ensure “replacement” and “repair” definitions and standards are consistent with WAC 173-26-231(3)(a). Repair activities should be defined to include a replacement threshold so that applicants and staff will know when “replacement” requirements need to be met.
- Give preference to those types of shoreline modifications that have a lesser impact on ecological functions. Policies and regulations should promote "soft" over "hard" shoreline modification measures.
- Consider requiring a Shoreline Conditional Use Permit for any new hard shoreline stabilization.

7.3.2 Piers and Docks

- Based on the apparent lack of residential piers and docks along the shoreline, consider prohibiting individual residential piers and docks in shoreline jurisdiction.
- For commercial, industrial, and recreational piers and docks, it may not be appropriate to have pre-defined standards. Standards for these uses should rely on mitigation sequencing to develop an appropriate design.
- Ensure repair activities are defined to include a replacement threshold so that it is clear when “replacement” requirements need to be met.

7.3.3 Fill

- Fill activity that would restore ecological functions should be allowed, such as improvements to shoreline habitats, material to anchor LWD placements, and as needed to implement shoreline restoration.

7.3.4 Breakwaters, Jetties, Groins and Weirs

- Consider prohibiting new breakwaters, jetties and groins, except where they are essential to restoration or maintenance of existing water-dependent uses.
- Address weirs as an in-stream structural use (see below).

7.3.5 Dredging and Dredge Material Disposal

- Except for purposes of shoreline restoration, flood hazard reduction and maintenance of existing legal moorage and navigation, consider prohibiting dredging.
- Establish provisions to allow for maintenance dredging while addressing long-term ecological issues.
- Consider prohibiting dredging and fill in tidal wetlands.

7.3.6 Shoreline Habitat and Natural Systems Enhancement Projects

- Consider incentives to encourage restoration projects. For example, allow modification of impervious surface coverage or setback requirements when paired with significant restoration.
- Emphasize that certain fills, such as streambed or nearshore gravels or material to anchor logs, can be an important component of some restoration projects.

7.4 Shoreline Uses

Following are recommendations for SMP shoreline use policies and regulations.

7.4.1 Agriculture

- Establish standards for new agricultural activities within shoreline jurisdiction, including shoreline buffers.

7.4.2 Aquaculture

- The City could consider prohibiting aquaculture *harvest* to be consistent with the Washington Department of Health prohibition on harvest. However, the City's SMP should continue to allow for aquaculture *cultivation* activities.

7.4.3 Boating Facilities

- Include standards for new boating facilities in the City, such as boat launches. Regulations for the over- or in-water components should be developed to provide applicants with as much predictability as possible, while still allowing for an appropriate amount of flexibility based on site-specific conditions and use-specific needs.

7.4.4 Commercial Development

- Recognize commercial uses and provide for a clear priority for water-oriented uses.
- Ensure water-dependent uses are not restricted by regulatory setbacks or buffers.
- Make provisions for public access and ecological restoration requirements for non-water-dependent uses to provide clear requirements for those areas where water-dependent uses are not practical. Identification of mitigation sites or provisions for mitigation banking also could accommodate such development.

7.4.5 Forest Practices

- WAC 173-26-241(3)(e) directs that the SMP should rely on the Forest Practices Act for regulation of commercial forestry.
- The SMP standards should apply to Class IV General Forest Practices where shorelines are being converted to non-forestry uses.

7.4.6 Industry

- Recognize industrial uses and provide for a clear priority for water-oriented uses.
- Ensure water-dependent uses are not restricted by regulatory setbacks or buffers.
- Make provisions for the public access and ecological restoration requirements for non-water-dependent uses to provide clear requirements for those areas where water-dependent uses are not practical.

7.4.7 In-stream Structural Uses

- Small-scale in-stream structures (e.g. tide gates) are found within the City. SMP policies and regulations should allow for continued use of such in-stream structures while ensuring the continued protection and preservation of ecosystem functions and cultural resources.
- Regulations may distinguish appropriate areas for in-stream structures based on shoreline environment designations.

7.4.8 Mining

- Consider whether mining should be allowed or prohibited in shoreline jurisdiction.
- If mining is allowed, clearly differentiate between upland and aquatic mining. Consider including policies which emphasize mining as far as practicable from shorelines, floodplains, and streams.

7.4.9 Recreational Development

- Policies and regulations related to parks management should provide clear preferences for shoreline restoration consistent with public access needs and uses. Existing natural areas in parks should be protected and enhanced.
- Coordinate park owners regarding applicable environment designations, existing and future land uses/developments, and restoration opportunities to ensure policies and regulations do not conflict with ongoing or future recreational developments and park management plans.
- Recreational access to the shoreline is a priority of the Act and the SMP should recognize that water-dependent recreation is a preferred use in shoreline jurisdiction.

7.4.10 Residential Development

- Incorporate clear dimensional criteria for residential development, such as setbacks/buffers, lot coverage, height limits, etc.
- Include provisions to ensure that new development, including the creation of new lots, would not require new shoreline stabilization. New primary and accessory residential structures should be located far enough from the shoreline to prevent such a need.

7.4.11 Transportation and Parking

- Allow for maintenance and improvements to existing roads, parking areas, or other transportation facilities.

- For necessary new roads and parking areas, ensure that alternatives are considered that evaluate the feasibility of locating outside of shoreline jurisdiction.

7.4.12 Utilities

- Allow for maintenance and improvements to existing utility facilities.
- Ensure that new utilities are sited based on an evaluation of alternatives with a preference for locating facilities outside of shoreline jurisdiction.
- Provide performance standards for necessary new utilities where other locations outside of shoreline jurisdiction are not feasible.

7.5 Restoration Plan

A valuable tool for shoreline management is a restoration plan. A restoration plan will be prepared at a later phase of the SMP update process, consistent with WAC 173-26-201(2)(f). The plan must address the following six subjects (WAC 173-26-201(2)(f)) and incorporate findings from this analysis report:

- (i) *Identify degraded areas, impaired ecological functions, and sites with potential for ecological restoration;*
- (ii) *Establish overall goals and priorities for restoration of degraded areas and impaired ecological functions;*
- (iii) *Identify existing and ongoing projects and programs that are currently being implemented, or are reasonably assured of being implemented (based on an evaluation of funding likely in the foreseeable future), which are designed to contribute to local restoration goals;*
- (iv) *Identify additional projects and programs needed to achieve local restoration goals, and implementation strategies including identifying prospective funding sources for those projects and programs;*
- (v) *Identify timelines and benchmarks for implementing restoration projects and programs and achieving local restoration goals; and*
- (vi) *Provide for mechanisms or strategies to ensure that restoration projects and programs will be implemented according to plans and to appropriately review the effectiveness of the projects and programs in meeting the overall restoration goals.*

The restoration plan will “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.” The restoration plan will mesh potential projects identified in this report with additional projects, regional or local efforts, and programs of each jurisdiction, watershed groups, and environmental organizations that contribute or could potentially contribute to improved ecological functions of the shoreline.

8 REFERENCES

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9 LIST OF ACRONYMS AND ABBREVIATIONS

AC	Acres
Assessor	Pacific County Assessor
CFS	Cubic feet per second
CMZ	Channel Migration Zone
Corps.....	US Army Corps of Engineers
DNR	Washington State Department of Natural Resources
Ecology	Washington State Department of Ecology
ESA.....	Endangered Species Act
GIS.....	Geographic information systems
Guidelines	SMP Guidelines
LWD.....	Large woody debris
OHWM	Ordinary high water mark
NOAA.....	National Oceanographic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NWI.....	National Wetlands Inventory
OFM	Washington State Office of Financial Management
Park Plan	South Bend’s 2011-2017 Comprehensive Park Plan
PHS.....	Priority Habitats and Species
RCW	Revised Code of Washington
SBMC	South Bend Municipal Code
SMA	Shoreline Management Act
SMP	Shoreline Master Program
TMDL.....	Total Maximum Daily Load
USFWS.....	US Fish and Wildlife Service
USGS.....	US Geological Service
WAC.....	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WWTP.....	Wastewater Treatment Plant

APPENDIX A

Assessment of Shoreline Jurisdiction

March 31, 2014

Dale Little
City of South Bend
PO Drawer 9
1102 W First Street
South Bend WA 98586

Re: South Bend SMP Update – Preliminary Shoreline Jurisdiction

The Watershed Company Reference Number: 130729

Dear Dale:

The Watershed Company, working in collaboration with the project team, has developed the enclosed Preliminary Shoreline Jurisdiction maps showing the draft shoreline jurisdiction for the Shoreline Master Program (SMP) update for the City of South Bend (City).

The draft shoreline jurisdiction shown in the maps is determined based upon the State Shoreline Management Act (SMA) and current Washington Department of Ecology (Ecology) rules and guidance documents. Under the SMA, the following areas are regulated as “Shorelines of the State” under the SMP:

- Marine waters;
- Streams and rivers with over 20 cubic feet per second (cfs) mean annual flow; their floodway and contiguous floodplain areas extending 200 feet from the floodway;
- Lakes 20 acres or greater in size, measured from ordinary high water mark (OHWM);
- Shorelands 200 feet landward from the OHWM of all marine waters, jurisdictional streams, rivers, and lakes; and
- Associated wetlands that are hydrologically connected to any of the shorelines described above, located entirely/partly within 200 feet of a jurisdictional waterbody, or are entirely/partly located within the waterbody’s 100-year floodplain.

GIS DATA

A first step towards updating the City’s shoreline jurisdiction was to compile and review existing GIS data to determine the best available data from which to assemble shoreline

jurisdiction. Table 1 below lists the specific GIS data components that were used to assemble shoreline jurisdiction.

Table 1. Shoreline jurisdiction component data.

Component	Source Layer File Name, Date	Agency	Notes
River and stream flow (20 cfs, 1,000 cfs)	SMA_Pnts_Sugg.shp, 2010	Ecology	For rivers and streams, provides the upstream extent of shoreline jurisdiction and the upstream extent of Shorelines of Statewide Significance based on a USGS study (described below).
OHWM	NHDFlowline, 2013	USGS	Coastal data from National Hydrography Dataset (NHD). Used for OHWM of partial Pacific coastline, Willapa Bay and estuary system.
	Pacific_County_SMP_hydro_delin_eations.shp, 2013	Olympic Natural Resources Center (marine spatial planning)	Used in all stream centerlines; OHWM of Pacific coastline, Willapa Bay and estuary system, and rivers.
	NHDWaterbody, 2013	USGS	From National Hydrography Dataset. Used for certain rivers.
	SMA_Poly_Sugg.shp, 2010	Ecology	Used for waterbodies.
	SMA_Poly_Adopt.shp, 2012	Ecology	Used for waterbodies.
	Lakes.shp, 2014	Pacific County	Used for waterbodies.
Floodway	S_FLD_HAZ_AR.shp, 2013	FEMA (provided by Pacific County)	Preliminary DFIRM data. Areas coded FW under FLOODWAY field.
100-year floodplain	S_FLD_HAZ_AR.shp, 2013	FEMA (provided by Pacific County)	Preliminary DFIRM data. Mapped are areas coded either A, AE, AO or VE under FLD_ZONE field.
Potentially associated wetlands	NWI.shp, 2011	US Fish and Wildlife Service (provided by Pacific County)	Subset of National Wetland Inventory. These wetlands have not been field verified and are for informational purposes only.

While the draft shoreline jurisdiction reflects the best available GIS data, the level of accuracy remains limited and may require ground-truthing at the time of development action review. Particularly in areas with dynamic ecological processes, such as areas with estuarine or marine influences or stream/river meandering, site-specific analysis of the OHWM, wetland boundary and/or hydrologic connectivity may be needed. Each jurisdiction map therefore includes the following disclaimer, derived from Ecology's recommendation:

All features depicted on this map are approximate. They have not been formally delineated or surveyed and are intended for planning purposes only. Additional site-specific evaluation at the project level may be needed to confirm/verify information shown on this map.

SHORELINE JURISDICTION

Streams/Rivers/Estuary

A combination of datasets was used to map the OHWM within Willapa Bay, the nearshore estuary system, and upstream along the Willapa River and its tributaries and sloughs, as noted in Table 1 above. The upstream limit of shoreline jurisdiction for streams and rivers is that point where the mean annual flow shifts from greater than 20 cfs to less than 20 cfs. The upstream 20 cfs point is based on a 1998 study by USGS provided by Ecology¹. For purposes of this preliminary map set, draft shoreline jurisdiction is shown extending up to the USGS 20 cfs points as directed by Ecology.

Jurisdictional waters which meet these criteria within the City include the following:

- Willapa River
- Skidmore Slough

Additionally, per the SMA, all areas within the floodway are included as part of shoreline jurisdiction, as well as the area up to 200 feet landward of the floodway where a contiguous floodplain is present. The current County preliminary FEMA DFIRM flood data (2013) was used to identify both the floodway and 100-year floodplain, where present. Floodway is not present within the jurisdictional boundaries of the City.

Rivers which have mean annual flow of 1,000 cfs or greater are considered "Shorelines of Statewide Significance," a special category of shorelines where specific priority uses are preferred. The Willapa River meets this definition. As well, harbors, bays, estuaries, and inlets, seaward from the OHWM and all shorelands associated with these waters are also considered Shorelines of Statewide Significance.

Lakes

Under the SMA, lakes 20 acres or greater in size qualify as Shorelines of the State. No lakes within the City meet this criterion.

¹ http://www.ecy.wa.gov/programs/sea/pubs/USGS_reports/WRIR%2096-4208.pdf

Associated wetlands

Associated wetlands are those wetlands that are “in proximity to and either influence or are influenced by ... tidal waters or a lake or stream subject to the Shoreline Management Act” and “[t]he entire wetland is associated if any part of it lies within the area 200 feet from either the ordinary high water mark or floodway” or “if any part is located within the 100 year floodplain of a shoreline”². Wetlands meeting the latter two criteria are mapped as “Potentially Associated Wetlands” in the attached maps. The locations and boundaries of these wetlands are drawn from National Wetlands Inventory (NWI) GIS data.

Non-associated wetlands are intentionally omitted from this map set. However, wetlands that are either outside of the floodplain or the 200-foot standard shorelands area may still be associated on the basis of a hydraulic connection to the shoreline. Wetlands that are separated by an obvious topographic break from the shoreline are not associated, provided they are outside the shoreland zone, and that the break is not an artificial feature such as a berm or road. These possible additional shoreline-associated wetlands can only be determined on a project-level basis at the time of permit application. Further, the NWI wetland data are drawn from high-resolution aerials and might not be completely accurate at a parcel level. Therefore, actual wetland presence and boundaries must be verified at the project level.

Optional shoreline jurisdiction boundaries

The information above describes assembly of the minimum shoreline jurisdiction. The City may further elect to expand jurisdiction to include:

- 1) All or part of the 100-year floodplain (as it is shown on the jurisdiction map), and/or
- 2) Buffers of associated wetlands³ that would otherwise encompass areas outside of shoreline jurisdiction.

Under either of these options, the area of shoreline jurisdiction increases and additional properties or areas of properties would be subject to the SMP and its permitting requirements.

RCW 36.70A.480(6) says “If a local jurisdiction's master program does not include land necessary for buffers for critical areas that occur within shorelines of the state, as authorized by RCW 90.58.030(2)(f), then the local jurisdiction shall continue to regulate those critical areas and their required buffers pursuant to RCW 36.70A.060(2).” Ecology’s SMP Handbook chapter on Shoreline Jurisdiction explains the implications of this RCW as follows:

² http://www.ecy.wa.gov/programs/sea/sma/st_guide/jurisdiction/Shorelands.html

³ The RCW actually allows for expansion of jurisdiction to include critical area buffers, not just wetland buffers. However, this generally is limited to wetland buffers in practice. The nature of non-shoreline streams as a mostly perpendicular element to a shoreline waterbody already brings their full buffer into shoreline jurisdiction. Geologically hazardous areas are generally assigned a setback, not a buffer. Critical aquifer recharge areas are not addressed in the SMA or SMP Guidelines, and CARAs further are not assigned a setback or a buffer.

If the local government chooses not to extend its shoreline jurisdiction under RCW 90.58.030(2)(f)(ii), the CAO will protect the entire critical area and its buffers (see RCW 36.70A.480(6)). The CAO will continue to apply to the entire critical area and its buffers, even after SMP approval. However, the SMP will also apply to the portion(s) of the critical area and its buffers that lie within shoreline jurisdiction. This means the subject critical area and some or all of its buffers will have "dual coverage" with regulation by both the SMP and the CAO.

Thus, extending SMA jurisdiction helps to reduce regulatory duplication in the future. This is a fundamental issue that should be carefully considered by the City. The attached map currently does not include expanded shoreline jurisdiction to include critical area buffers and/or floodplain. Classification of associated wetlands, which would ultimately determine the regulatory buffer, has not been conducted and would be done on a site-by-site basis at the time of a development application. Evaluation of the impact from expanding jurisdiction to include floodplains can be assessed by viewing the floodplain extent as shown on the jurisdiction map.

Please call if you have any questions or if we can provide you with any additional information.

Sincerely,

A handwritten signature in blue ink, appearing to read "Dan Nickel", is written over a light blue circular stamp.

Dan Nickel
Environmental Engineer

Enclosure

APPENDIX B

Shoreline Inventory Map Folio