

**PACIFIC COUNTY
GRANT NO. 1400525**

CUMULATIVE IMPACTS ANALYSIS

Pacific County's Shoreline Master Program

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CUMULATIVE IMPACTS ANALYSIS

PACIFIC COUNTY SHORELINE MASTER PROGRAM

1 INTRODUCTION

This Cumulative Impacts Analysis assesses the proposed Pacific County Shoreline Master Program (SMP) policies and regulations in relation to current shoreline conditions documented in the Shoreline Analysis Report (TWC et al. 2015) to assess if future development approved under the proposed SMP could achieve no net loss of ecological function. This Cumulative Impacts Analysis can help the county make adjustments where appropriate in its proposed SMP if there are potential gaps between maintaining and degrading ecological functions.

1.1 Background

The State Master Program Approval/Amendment Procedures and Master Program Guidelines (SMP Guidelines; WAC 173-26) require local shoreline master programs to regulate new development to “achieve no net loss of ecological function.” The Guidelines (WAC 173-26-186(8)(d)) state that, “To ensure no net loss of ecological functions and protection of other shoreline functions and/or uses, master programs shall contain policies, programs, and regulations that address adverse cumulative impacts and fairly allocate the burden of addressing cumulative impacts.”

The Guidelines further elaborate on the concept of no net loss as follows:

“When based on the inventory and analysis requirements and completed consistent with the specific provisions of these guidelines, the master program should ensure that development will be protective of ecological functions necessary to sustain existing shoreline natural resources and meet the standard. The concept of “net” as used herein, recognizes that any development has potential or actual, short-term or long-term impacts and that through application of appropriate development standards and employment of mitigation measures in accordance with the mitigation sequence, those impacts will be addressed in a manner necessary to assure that the end result will not diminish the shoreline resources and values as they currently exist. Where uses or development that impact ecological functions are necessary to achieve other objectives of RCW 90.58.020, master program provisions shall, to the greatest extent feasible, protect existing ecological functions and avoid new impacts to habitat and ecological functions before implementing other measures designed to achieve no net loss of ecological functions.” [WAC 173-26-201(2)(c)]

In short, updated SMPs shall contain goals, policies and regulations that prevent degradation of ecological functions relative to the existing conditions as documented in that jurisdiction’s inventory and characterization report. For those projects that result in degradation of ecological functions, the required mitigation must return the resultant ecological function back to the

baseline. This is illustrated in the figure below. The jurisdiction must be able to demonstrate that it has accomplished that goal through an analysis of cumulative impacts that might occur through implementation of the updated SMP. Evaluation of such cumulative impacts should consider:

- (i) current circumstances affecting the shorelines and relevant natural processes [Chapter 2 below and the Shoreline Analysis Report];
- (ii) reasonably foreseeable future development and use of the shoreline [Chapter 3 below and the Shoreline Analysis Report]; and
- (iii) beneficial effects of any established regulatory programs under other local, state, and federal laws.” [Chapter 5 below]

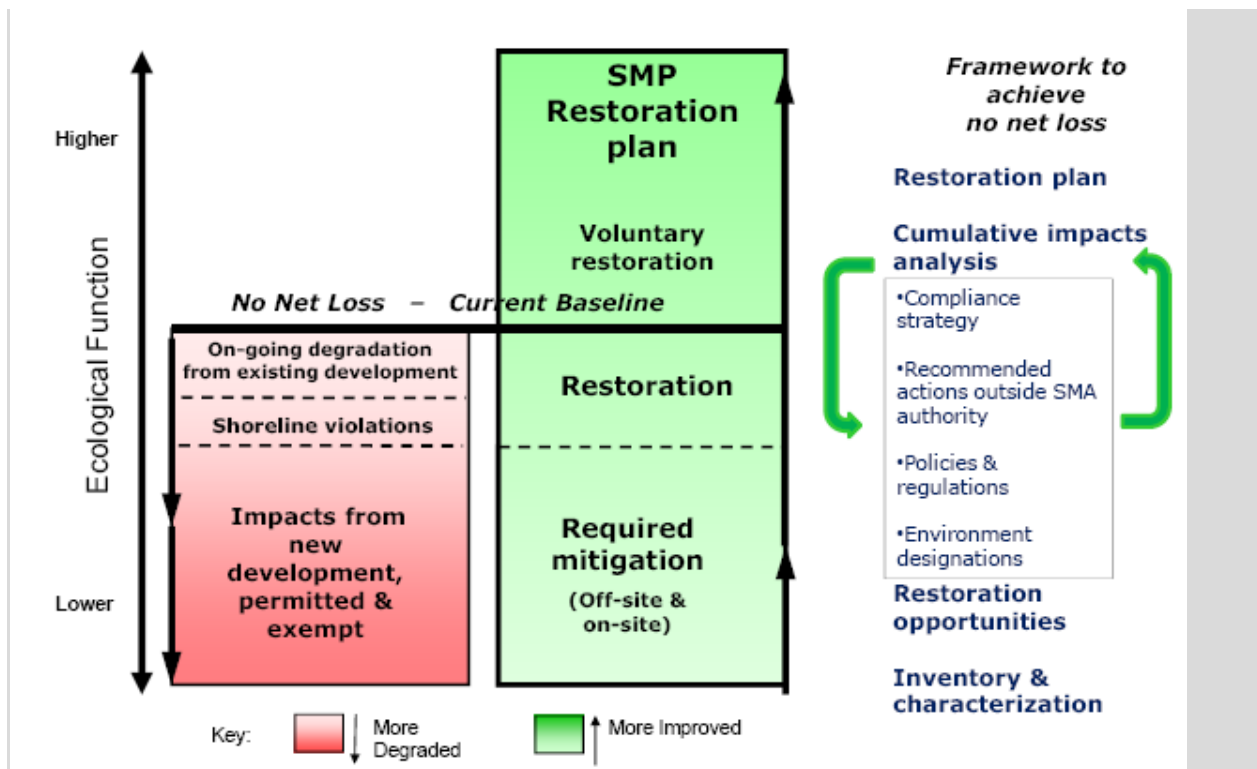


Figure 1-1. Framework to achieve no net loss of ecological function. (Department of Ecology)

The Cumulative Impacts Analysis assesses the policies and regulations in the draft SMP to determine whether no net loss of ecological function will be achieved as new development occurs. SMP regulations fundamentally rely on the concept of mitigation sequencing to avoid, minimize, and mitigate for any unavoidable losses of function. An accompanying component of the SMP process that can bring environment conditions to an improved level is the Shoreline Restoration Plan, which identifies and prioritizes potential actions and programs that may be

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

As the SMP is implemented, the county will need to identify methods to track shoreline conditions, permit activity, and policy and regulatory effectiveness. County planning staff will be required to track land use and development activity, including exemptions, within shoreline jurisdiction, and may incorporate actions and programs of the other departments as well. With each project application, staff should consider whether implementation of the SMP is meeting the basic goal of no net loss of ecological functions relative to the baseline condition established in the Shoreline Analysis Report. The County will review, and if necessary revise, the SMP at least once every eight years to ensure that the SMP complies with applicable federal, state, and local regulations and is consistent with the County’s comprehensive plan and development regulations in effect at the time of the review. With this level of attention to conditions, permitted development, and adaptive management as needed in the long term, the County should be able to ensure that the regulations and mitigation sequencing required by the SMP will maintain shoreline functions over time.

1.2 Document Approach and Overview

This Cumulative Impacts Analysis was prepared consistent with direction provided in the Shoreline Master Program Guidelines as described above. The ultimate goal of this document is to determine whether future development in the County’s shorelines taking place under the proposed SMP would result in no net loss of ecological functions relative to the baseline conditions documented in the Shoreline Analysis Report. To the extent that existing information was sufficiently detailed and assumptions about possible new or re-development could be made with reasonable certainty, the following analysis is quantitative. The analysis in this document is focused on unincorporated county lands.

Existing conditions were first evaluated using the information, both textual and graphic, developed and presented in the Shoreline Analysis Report. A summary of existing conditions, including ecological conditions and land use, is provided in Chapter 2. More detailed analysis of specific shoreline functions, uses, and public access can be found in the Shoreline Analysis Report.

To understand what future development activities in the county's shorelines might occur that could alter existing conditions, Chapter 3 presents the brief results of an assessment of likely future development. This assessment is based on existing land use conditions, growth trends, and zoning. This approach is based on the rationale that future changes in land use trends will be roughly comparable to past trends. Given the expansive area of the county's shorelines, this approach helps provide a realistic estimate of the level of foreseeable development.

The effects of likely development were then evaluated in the context of SMP provisions, as well as other related plans, programs, and regulations. For the purpose of evaluating impacts, areas with a likelihood of high densities of new development were evaluated in greatest detail. Chapter 4 summarizes this evaluation, describing how foreseeable development could affect shoreline conditions, and what specific provisions of the proposed SMP will help maintain existing conditions in spite of likely future development. Chapter 5 describes the beneficial effects that other established regulatory programs may have on the County's shorelines.

Finally, Chapter 6 synthesizes the information from the previous chapters to assess anticipated cumulative impacts and summarize whether and how the SMP ensures no net loss of ecological functions for shorelines in Pacific County.

2 SUMMARY OF EXISTING CONDITIONS

This summary of existing conditions is intended to provide an overview of conditions in the county's shorelines, and is based on the Shoreline Analysis Report. For the purposes of the Shoreline Analysis Report, county shorelines were divided into individual Assessment Units (AU), generally consistent with fifth-order hydrologic units. Because of the inherently different processes and functions on marine, estuarine, and freshwater shorelines, Pacific Coast shorelines and estuarine shorelines were addressed in separate AUs. In order to assess shoreline functions at a local scale, the ten AUs with upland areas within the county were broken into discrete reaches.

Maps of the AUs and reaches, and more detailed information on specific shoreline areas, is provided in the Shoreline Analysis Report.

2.1 Willapa (WRIA 24)

The majority of Pacific County lies within the Willapa watershed. It consists of several medium-sized rivers originating in the Willapa Hills and flowing into Willapa Bay. The main watercourses include: the Cedar, North, Willapa, Palix, Nemah, Naselle, Niawiakum, and Bear Rivers, and Smith Creek. WRIA 24 extends south to Cape Disappointment, at the mouth of the Columbia River. The following section addresses the main freshwater drainages in Pacific County. Those AUs that are predominantly marine and estuarine are discussed separately under Section 2.4 below.

2.1.1 Environment

North River AU

The North River AU includes the North River, Smith Creek, and the upper portion of the Cedar River. Water levels in the lower reaches of shoreline waterbodies in the North River AU are influenced by tides. Dikes, constructed at the turn of the century for agricultural purposes, are present along much of the lower reach of the North River and are equipped with flood gates that limit marine influence and connectivity to the large wetland complexes.

Forest cover is naturally lower in the lower reaches of the AU, where flooding regimes cause emergent wetlands to predominate. The dikes along the North River likely alter the emergent wetland composition from estuarine salt marsh to palustrine emergent characteristics.

The upper reaches in this AU do not have any mapped floodplains. Reduced riparian forest cover is associated with rural residential development along the upper reaches of the North River, Raimie Creek, Redfield Creek, and a portion of Smith Creek.

Road densities are generally lower in the North River AU compared to other AUs in the county and few fish passage barriers exist.

Willapa River AU

The Willapa River AU extends upstream from the westernmost extent of the Willapa River channel. In the Willapa River, tidal influence extends upstream from Willapa Bay to approximately the confluence with Mill Creek. Several dikes are present in the lowermost reach of the River.

In the upper reaches of the AU, mapped floodplains are generally limited. Where floodplain areas are mapped, much of the forested vegetation has been cleared in association with rural residential and agricultural development (particularly along the Willapa River, Wilson Creek, and Whitcomb Creek).

Total vegetation cover is high in the AU. However, forest cover is moderate to low throughout most of the shoreline reaches. In the lower reaches, the limited forest cover may be related to tidal flooding regimes, which are more conducive to the development of emergent and scrub-shrub wetlands. Total vegetation coverage is lowest where a road, residential, or marine industrial development are located.

In the upper reaches, forest cover is lower in association with areas of rural residential and agricultural development.

Large wetland complexes are present along the lower reaches of the Willapa River. The wetlands provide habitat for waterfowl concentrations. Dikes on the north side of the lower river limit habitat connectivity for salmonid rearing. The tidal wetlands to the south of the lowermost reach provide salmonid rearing opportunities; however, fish passage barriers at U.S. 101 restrict salmonid use of potential wetland habitats southwest of the road.

Middle Bay AU

Reaches in the Middle Bay AU include areas of tidal and riverine influence. These reaches are predominantly undeveloped, and no armoring or levees are mapped. Mapped floodplains are limited to intertidal areas. Numerous historic splash dams in the watershed have likely caused channel incision, disconnecting channels from their historic floodplains. A weir and wastewater outfall are present at the State fish hatchery facility on the North Nemah River.

Forest cover and total vegetation coverage are high throughout shoreline jurisdiction in the AU. Salt marsh vegetation is extensive along the lower reaches of this AU. Clear cut areas are apparent in the surrounding forest landscape; however, these areas tend to occur outside of shoreline jurisdiction.

The Canon River (Palix Watershed) and Williams Creek (Nemah Watershed) are among the top chum salmon producing streams in the Willapa Watershed. The Willapa Fisheries Recovery Team and The Willapa Alliance (1996) ranked the Palix Watershed as the top salmon production area in the Willapa Watershed. The Nemah Watershed was ranked fourth.

Freshwater wetlands in the upper portions of the Bone River and South Fork Palix River are located far from spawning habitats, so their direct habitat functions may be limited; however, these wetlands provide important functions for water quality and quantity.

Several partial fish passage barriers and one total barrier are present at tributaries to the North Nemah River as a result of forest road crossings.

Naselle River AU

Dikes are present along the lowermost reaches of Bear River, as well as most of Naselle River Reaches 3 and 4. The dikes on the Bear River are located to protect U.S. 101, road infrastructure for Jeldness Road, and residential development. The perimeter dikes in Reach 4 and the southern part of Reach 3 of the Naselle River restrict flooding to allow for agricultural uses, whereas the northern perimeter dike in Reach 3, which surrounds lands owned by WDFW, includes breaches that allow for tidal channel formation and functions on the western side of the dike.

Ellsworth Creek is ranked highest for forest cover among the AUs in the county; the Nature Conservancy owns most of the area within this reach. Forest cover scores for the lower reaches are highest on the Stanley Peninsula. Other reaches with high levels of forest cover include Reach 3 of the Bear River, Dell Creek, Reach 7 of the Naselle River, and Reach 2 of the South Naselle River; these reaches are predominantly under forestry uses. Lower forest cover rankings in Reach 1 of the South Naselle River and Reach 6 of the Naselle River are associated with rural residential development.

Total vegetation coverage is high throughout the AU. Salt marsh and freshwater wetlands provide diverse habitat opportunities in this AU. The lower reaches of the Bear River and Naselle River support waterfowl assemblages.

The Bear River is a significant basin for chum salmon productivity. Several partial and total fish passage barriers are present along Salmon Creek in association with Highway 4. A functional fishway allows for fish passage at the State hatchery weir facility in Reach 6 of the Naselle River.

2.1.2 Land Use

The Willapa WRIA is characterized primarily by forestry use. Logging began in the mid-1800s and nearly three-quarters of the land in the County is still used for timber production (Smith 1999). Other significant land uses include government/institutional, agriculture, and residential. The majority of land is privately owned, but there is also government ownership that varies by AU.

According to WDNR, 26 floating homes are largely moored in the middle of the channel and along the western bank in the lowermost reach of the North River. Prior to 1993, these floating homes were essentially unregulated. At that time, the County found that the floating homes were causing water quality degradation associated with discharge of human sewage and gray water into the North River. In response, the Pacific County Board of County Commissioners passed Resolution 093, which required floating home owners to enter into a Compliance Agreement with the County to mitigate the impacts of sewage and gray water discharge.

These floating homes did not have lease agreements with WDNR. WDNR agreed to allow the floating homes to remain on State-owned aquatic lands provided the owners entered into leases with the State and complied with the terms of the County's Compliance Agreement. The County is currently working with WDNR to assume responsibility for managing these floating homes through creation of an Open Water Moorage and Anchorage Area.

2.2 Chehalis (WRIA 22/23)

The Chehalis basin consists of approximately 2,766 square miles and spans eight counties. The Chehalis Watershed drains the western side of the Willapa Hills, the Black Hills, an area of low mountains on the west side of the Cascade Range, and the lower south slopes of the Olympic Range.

A portion of the Elk and Andrews Rivers of WRIA 22 extends south into Pacific County. These rivers flow north from the Willapa Hills into the South Bay of Grays Harbor, but within Pacific County, they do not meet the minimum flow criteria for Shorelines of the State.

A portion of WRIA 23 extends into the eastern portion of Pacific County. Shorelines of the State that occur in Pacific County include the following tributaries to the Chehalis River: Elk Creek, Little Elk Creek, Swem Creek, Eight Creek, Rock Creek, and Crim Creek. These tributaries drain east from the eastern edge of the Willapa Hills.

2.2.1 Environment

Upper Chehalis AU

Mapped floodplains are not present within this AU. The Grays Harbor County Lead Entity (2011) noted that upper Rock Creek, Crim Creek, and Elk Creek are incised, resulting in disconnected floodplain conditions.

Extensive erosion has been documented in Elk Creek and several of its tributaries, including Crim Creek (Grays Harbor County Lead Entity 2011). High sediment loads have also been documented in Rock Creek (Grays Harbor County Lead Entity 2011). Landslides, predominantly associated with roads, account for a major portion of sediment in the Upper Chehalis Basin (Grays Harbor County Lead Entity 2011).

Shoreline reaches in this AU have moderate to high areas of alluvial soils, and hyporheic functions are expected to play a role in maintaining flows and temperatures in these waterbodies.

Lower forested vegetation cover along Rock Creek is related to rural residential development and Highway 6, which parallels the creek. Although Crim Creek and Elk Creek have relatively high rankings for forested vegetation, the Grays Harbor County Lead Entity (2011) noted that Upper Crim Creek has the highest proportion of immature vegetation (22%) in the Upper Chehalis Mainstem subbasin. The occurrence and coverage of wetlands is lower in this AU compared to other AUs in the county. This result reflects a natural trend toward fewer and smaller wetlands in steeper, confined reaches of the watershed, rather than degradation of functions.

The entire AU is within the winter range for Roosevelt elk.

All of the reaches in the AU provide known spawning habitat for winter steelhead. Use of Elk Creek by coho salmon and resident cutthroat trout is also documented by WDFW. Two fish passage barriers associated with crossings of Highway 6, one partial and one total, are located along Rock Creek (WDFW 2013).

2.2.2 Land Use

Timber harvest occurred throughout the WRIA for most of the 20th century and remains the predominant land use. Three-quarters of the land in the Upper Chehalis AU is owned by a private timber company, with another 14 percent in state ownership. Approximately 80 percent of the land is currently in forestry use, and three percent is vacant or undeveloped.

2.3 Grays/Elochoman (WRIA 25)

A small portion of the Grays/Elochoman Watershed occurs in the southeastern corner of the county. Subbasins within the Grays/Elochoman watershed consist of relatively short coastal streams and rivers draining from the southern Willapa Hills to the Columbia River. With the exception of the Chinook River and Wallacut River, which meander through a low-lying valley, the other small (Class II) tributaries in the county are characterized as fairly steep channels passing through the Willapa Hills.

2.3.1 Environment

Grays River AU

Shorelines within this AU are located above the upper extent of tidal influence. Mapped floodplains are not present. A privately owned diversion dam is located along the Grays River.

Forest cover is high throughout the AU. Much of the watershed area in the East Fork Grays River has been harvested for timber; however, forested buffers remain, resulting in high functional rankings for forest cover in this reach. Similar to the Upper Chehalis AU, wetland coverage is lower in this AU compared to most other AUs in the county. This result reflects a natural trend toward fewer and smaller wetlands in steeper, confined reaches of the watershed, rather than degradation of functions.

Steelhead, coho salmon, and resident cutthroat trout have been documented to occur in all reaches within the AU. The West Fork Grays River provides known spawning habitat for Chinook and chum salmon. Chinook salmon have also been observed in the shoreline reaches in the Grays River and the East Fork Grays River. A State salmon hatchery is located on the West Fork Grays River.

2.3.2 Land Use

Land in the Grays/Elochoman WRIA is predominantly in forestry use and is 92 percent privately owned, mostly by timber companies. Ninety-nine percent of the land in the Grays River AU is designated as Forest of Long term Significance in the County's Comprehensive Plan.

2.4 Marine and Estuarine Shorelines

2.4.1 Environment

Columbia River

The Columbia River is the largest river on the West Coast of the US, draining about 260,000 mi² and extending from British Columbia to the Pacific Ocean between Oregon and Washington. Dam regulation on the Columbia River has reduced the magnitude and altered the timing of peak flows from historic levels of 1.2 million cfs to levels ranging from 100,000 to 500,000 cfs (Marriott et al. 2002). A comparison of historic (1859-1899) and recent (1970-1999) sediment transport loads at Vancouver, Washington showed a reduction in annual sediment transport load of between 10.8 and 12.5 million metric tons, equivalent to 52 to 61.5% of the total sediment historic sediment load (Bottom et al. 2005).

The mouth of the Columbia River has three jetties; the north and south jetties and Jetty "A." The north and south jetties flank the mouth to the northwest and southwest while Jetty A lies to the east of the north jetty and the west of Sand Island. The construction of the jetties, land use practices, in-filling, and sedimentation have resulted in changes to the tidal prism and sedimentation patterns over time.

Current wild populations of salmon in the Columbia River basin represent only 12% of their historic numbers (Bottom *et al.* 2005). Hatchery fish represent approximately 50% of all fall Chinook salmon in the entire basin, and over 85% of the fall Chinook salmon from the lower and middle subbasins of the watershed (Genovese and Emmett 1997). The diversity of salmon life histories, including different ocean-type Chinook salmon strategies, in the Columbia River has decreased substantially since the early 1900s (Burke 2004, Bottom et al. 2005).

Water quality monitoring from 2004 to 2007 found elevated levels of PCBs and PAHs in tissues sampled from the Columbia River Estuary (Lower Columbia River Estuary Partnership 2010). The legacy pesticide, DDT, was also identified in salmonid tissues in 2007 sampling.

Willapa Bay

Willapa Bay supports one of the nation's largest commercial shellfish industries, as well as a diversity of high-functioning ecosystems, including salt marshes, eelgrass beds, and mud flats.

Over sixty percent of the area of Willapa Bay, or 84 square miles, is composed of intertidal habitat (Coastal Resources Alliance 2007), and most of the remaining subtidal areas range from approximately one to six feet deep at low tide (Hedgpeth and Obrebski 1981). The most recent estimate indicates that 64 percent of historic estuarine wetlands have been lost in Willapa Bay as a result of diking and filling activities (Coastal Resources Alliance 2007). Tide gates have also restricted natural estuarine connectivity and limited fish passage opportunities (Smith 1999).

Willapa Bay has historically been known for its excellent water quality conditions. Nevertheless, several areas within Willapa Bay are listed as impaired for water quality parameters including temperature, fecal coliform bacteria, dissolved oxygen, and pesticides.

Recruitment and abundance of many commercially and recreationally important marine species are dependent on productive estuarine rearing conditions. Invasive and non-native species are a concern throughout Pacific County. In Willapa Bay, in particular, *Zostera japonica*, a non-native, invasive eelgrass, and populations of native burrowing shrimp (*Neotrypaea californiensis* and *Upogebia pugettensis*) make areas unsuitable for shellfish beds.

Pacific Coast

The Pacific Coast along Pacific County is part of the Columbia River Littoral Cell (CRLC). The primary source of sediment to the CRLC and the shores of Pacific County is the Columbia River. The large source of sediment from the Columbia River combined with the strong northerly longshore sediment transport regime during the winter results in the transport of Columbia River-sourced sand to Willapa Bay during the winter months. Due to the weak southerly summer transport capabilities of the littoral cell, sediment from Willapa Bay primarily remains in the estuary and in the surrounding sub-cells (Gelfenbaum et al. 1999).

Tides for Pacific County are of the mixed semi-diurnal type typical of the North American Pacific Coast, characterized by two unequal high and low tides per day.

The Pacific County shoreline is very dynamic, featuring spatially and temporally variable rates of both accretion and erosion. Since their construction, jetties at the mouth of the Columbia River and the entrance to Grays Harbor caused rapid progradation of barrier beaches, but since the construction of dams in the Columbia River and the start of dredging and disposal maintenance programs, the coastline has locally experienced high levels of erosion (Venturato et al. 2007). Between the 1950s and the 1990s, Cape Disappointment experienced erosion rates of about 40 feet per year and Leadbetter Point saw erosion rates of about 30 feet per year. The only locations that experienced shoreline accretion between the 1950s and the 1990s in Pacific County were at Grayland (4 feet per year) and at Ocean Park (8 feet per year) (Kaminsky et al. 2010).

2.4.2 Land Use

The county's marine and estuarine shorelines support more varied land uses relative to the rest of shoreline jurisdiction. Land uses include government/institutional, agriculture, recreation, and residential.

Early records of the Long Beach Peninsula document extensive meadows, which were used for grazing (Wiedemann 1984). Following agricultural uses, commercial and residential development began on the Peninsula to accommodate beachgoers (History Link, electronic reference). Tourism increased with the development of commercial rail and the production of the automobile at the beginning of the 20th century.

The detached spits of Willapa Bay support the State's only non-tribal commercial razor clam fishery. Each year, the fishery draws beachgoers to the Pacific Coastal beaches. Offshore waters are frequently used for recreational bottomfish, lingcod, and salmon fishing, as well as commercial fishing (Washington Marine Spatial Planning, electronic reference).

Oysters and clams are cultivated over approximately 17,000 acres of tidelands in Willapa Bay, more acreage than all other aquaculture areas in Washington State combined (Northern Economics 2013). The shellfish industry directly provides between 800 and 1,500 jobs in Pacific County, and when indirect economics are considered, it is responsible for 15 to 24 percent of the labor-earned income in Pacific County (Flores and Batker 2014). Successful aquaculture production is dependent on good water quality conditions, low fine sediment loads, and a consistent range of salinities.

The ten major commercial fisheries occurring along the county's Pacific Coast include Dungeness crab pots, salmon trolling, pink shrimp, baitfish lampara, non-shrimp shellfish pots, herring lampara, sardine purse seine, herring purse seine, herring dip bag net, and coastal hagfish pots (Industrial Economics, Inc. 2013). Two of the most important commercial fishing ports in Washington, the Ports of Ilwaco and Chinook, are located in Pacific County. Processing and packaging facilities, fish distribution, and sales at local markets and restaurants located in the county create additional local jobs and revenue.

3 FUTURE DEVELOPMENT

State SMP guidelines (WAC 173-26) require that jurisdictions preparing SMP updates conduct an analysis to estimate the future demand for shoreline space (WAC 173-26-201(3)(D)). To fulfill this requirement, this section draws on several sources of information to understand potential new shoreline development in the county.

This section first summarizes the results of the land use analysis, including existing land use patterns and trends in population and housing growth. It then presents an evaluation of future development potential by analyzing the amount and distribution of vacant lands in the County within the context of the county's existing zoning designations and proposed shoreline environment designations. The section concludes with a summary of reasonably foreseeable future development within county shorelines.

3.1 Analysis of Development Trends

Two sources of information were used to assess the likelihood and magnitude of new development. The first is the summary of past population and employment growth trends in the county. The Washington State Office of Financial Management (OFM) provides estimates of intercensal population and housing units for each County in the state. Over the past 20 years (1990 – 2010), Pacific County (unincorporated Pacific County in particular) has experienced a low annual growth rate in population and housing units. In 2013, the population of Pacific County was approximately 21,000. Population has remained steady with a less than one percent annual growth rate since 2006. The trend for housing units is consistent with population growth, with a one percent annual growth rate since 1990.

Figure 3-1 compares historical trends for population and housing units for unincorporated Pacific County between 1990 and 2013.

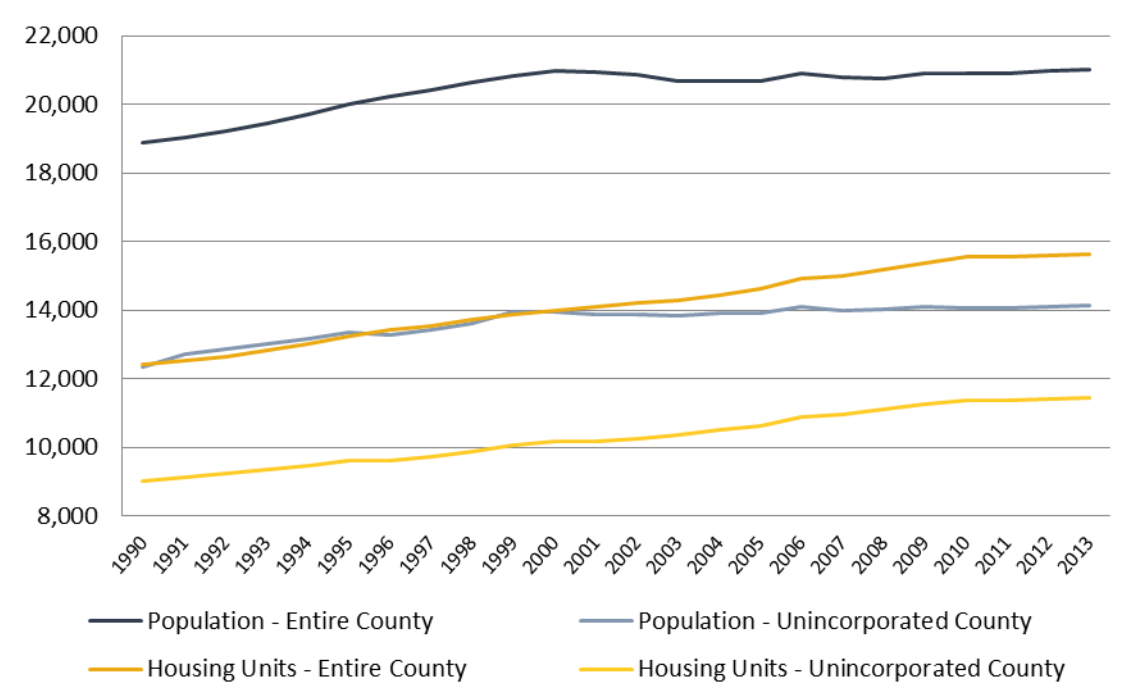


Figure 3-1. Population and housing units in Pacific County, 1990-2013. Source: OFM 2013; BERK 2014.

The majority of Pacific County residents reside in its unincorporated areas. In 2013, the population of unincorporated county lands was 14,125, or approximately 67 percent of countywide population. The annual growth rate of population in unincorporated Pacific County has been less than one percent annually since 1990. In 2013, there were 11,445 housing units in unincorporated Pacific County, or around 73 percent of the county’s total housing units.

The second source of information is the county’s population and dwelling unit forecasts and land capacity analysis. Consistent with the GMA, the county developed forecasts for 2030 as part of its 2010 Comprehensive Plan update. The plan forecasts a population increase of 4,970, increasing the county’s population from 21,800 in 2009 to 26,770 in 2030. This would represent an annual growth rate of 1.14 percent, or 22.8 percent for the entire 20-year period. A third of this predicted growth would be accommodated in the county’s incorporated areas, and the remaining two thirds (3,286) would be accommodated in unincorporated areas. This number is higher than the county’s average growth rate over the last 20 years, and higher than OFM’s “medium” predictions but less than OFM’s “high” growth rate. The county chose this number because it is consistent with the predictions used in their 1998 Comprehensive Plan.

3.2 Analysis of Vacant Lands

New shoreline development is expected to typically occur on vacant lands. The county’s zoning districts and the proposed shoreline environment designations (see Section 4.1 of this document) dictate what types of shoreline development are allowed where. Together, these three elements – vacant land, zoning, and shoreline environment designation – provide a framework for future development in Pacific County. Table 3-1 summarizes vacant land area by

zoning district and proposed shoreline environment designation. Shorelines in the Grays Harbor AU do not have vacant lands that are not otherwise designated as resource lands of statewide significance, and are therefore excluded from this summary.

Table 3-1. Vacant Land by Zoning District and Shoreline Environment Designation.

Zoning District	Vacant Lands (Acres) by Shoreline Environment Designation						Total
	Coastal Conservancy	High Intensity	Natural	Rural Conservancy	Shoreline Residential	Willapa Bay Conservancy	
Agriculture				155		250	405
Commercial Community District		1		2		4	7
Conservation						148	148
Commercial Forestry				9		24	33
Transitional Forest Land			4	127		330	461
Industrial				26		19	45
Mixed Use		2		89	2	19	112
Restricted Residential	8			17	4	43	72
General Residential	3					3	6
Resort District				12			12
Rural Lands				1150	22	511	1683
Rural Residential	16			310		386	712
Remote Rural				26			26
Mixed Use – Tokeland					11	18	29
UGA							0
Total	27	3	4	1923	39	1755	3751

Source: Pacific County 2015; BERK 2015.

Most of the vacant land area (3,687 acres, or 98 percent) is within the Rural Conservancy or Willapa Conservancy shoreline environment designation.

The largest portion of vacant land within shoreline jurisdiction is zoned Rural Lands (1,683 acres, or 45 percent). The Pacific County Code (PCC) describes the intent of the Rural Lands zoning district as follows:

The rural lands district is established to promote and protect the county's existing rural areas consisting of low-density residential neighborhoods, active farming practices, active forestry practices, and home based commercial activities that exist in harmony with each other and the natural environment. It is the intent of the district to continue promoting a flexible land use system in the rural areas which fosters a diverse, rural economy, while recognizing a rural lifestyle dependent up on the protection of both property rights and environmental values. The rural lands district encompasses lands labeled as general rural on the Pacific County comprehensive plan maps (PCC 18.40.010).

The Rural Lands zoning district supports future development that is generally consistent with existing development patterns. Other significant zoning designations of vacant land include Agriculture, Transitional Forest Land, and Rural Residential. These zoning districts generally permit low-intensity land uses and development.

Critical areas, including associated wetlands and, to a lesser degree, floodplains, decrease the building capacity of some shoreline areas. Of the approximately 3,751 acres of vacant lands in shoreline jurisdiction, approximately 2,607 acres contain identified wetlands that will restrict future development on these lands. Table 3-2 summarizes, for each shoreline environment designation, the percentage of vacant lands in shoreline jurisdiction encumbered by wetlands. Particularly in the Natural and Willapa Bay Conservancy environment designations, the majority of undeveloped parcels are encumbered to some extent by wetlands. In the Willapa Bay Conservancy environment, salt marsh wetlands are commonly present along the shoreline, and wetland buffers will typically be more restrictive than the proposed shoreline buffers.

Table 3-2. Vacant Lands and Wetlands by Shoreline Environment Designation.

Shoreline Environment Designation	Vacant Land (Acres)	Vacant Land with Wetlands (Acres)	Vacant Land without Wetlands (Acres)	Vacant Land without Wetlands (Percent Area)
Coastal Conservancy	27	6	21	81
High Intensity	3	1	2	67
Natural	4	3	1	25
Rural Conservancy	1922	1155	767	40
Shoreline Residential	39	5	34	87
Willapa Bay Conservancy	1755	1437	318	18
Total	3750	2607	1143	

It is important to note that this analysis provides an indication of land capacity, but does not address the likelihood of development. It also overestimates land capacity because, generally, parcels in the county are relatively large. Therefore, property owners may have the opportunity to set new construction upland and outside of shoreline jurisdiction.

3.3 Summary of Reasonably Foreseeable Future Development

3.3.1 Willapa (WRIA 24)

Most of the vacant land available for development in the county is within the Willapa WRIA (approximately 96 percent). Based on zoning and proposed shoreline environment designations, future development in the Willapa WRIA will likely be generally consistent with existing uses and development patterns. The majority of the shoreline is used for forestry practices, which are expected to continue. Other lower-intensity land uses such as agriculture, government, recreation, and residential development will continue to develop as well. However, the majority of available vacant land is designated as conservancy, which will limit the type and intensity of development. Future development is expected to follow the slow pace of development experienced in recent years.

3.3.2 Chehalis (WRIA 22/23)

Limited vacant land is available for development in the Chehalis WRIs (approximately 26 acres, or three percent of vacant land countywide). Based on zoning and proposed shoreline environment designations, future development in the Chehalis WRIs will likely be generally

consistent with existing uses and development patterns. The majority of the shoreline is used for forestry practices, which are expected to continue. The majority of available vacant land is designated as conservancy, which will limit the type and intensity of development. Future development is expected to follow the slow pace of development experienced in recent years.

3.3.3 Grays/Elochoman (WRIA 25)

Limited vacant land is available for development in the Grays/Elochoman WRIA (approximately 48 acres, or three percent of vacant land countywide). Based on zoning and proposed shoreline environment designations, future development in the Grays/Elochoman WRIA will likely be generally consistent with existing uses and development patterns. The majority of the shoreline is used for forestry practices, which are expected to continue. The majority of available vacant land is designated as conservancy, which will limit the type and intensity of development. Future development is expected to follow the slow pace of development experienced in recent years.

3.3.4 Marine and Estuarine Shorelines

The county's marine and estuarine shorelines have the most varied land uses and development patterns in the county. Tourism, recreation, and residential uses are common along the marine and estuarine shorelines, and they are expected to continue with future development. Aquaculture and fishing, both commercial and recreational, will also continue to be a major land and aquatic uses for the county's marine and estuarine shorelines. The majority of available vacant land is designated as Rural Conservancy (along the Columbia River Estuary) or Willapa Bay Conservancy environment, which will limit the type and intensity of development. Overall, future development is expected to follow the slow pace of development experienced in recent years.

4 APPLICATION OF THE SMP

This chapter describes how foreseeable development could affect shoreline conditions, and what specific provisions of the proposed SMP will help maintain existing conditions in spite of likely future development. This chapter begins, in Section 4.1, with a summary of the county's proposed environment designation scheme and a discussion of how the scheme allocates allowed uses by relating environment designations to ecological functions. Section 4.2 presents key general standards and regulations in the SMP intended to protect the ecological functions of the shoreline. Section 4.3 includes the following for each specific use or modification listed in the SMP:

- An assessment of the future development potential for the use or modification, if allowed by available data;
- A summary of the potential impacts that could result from future development of the specific use or modification; and

- A summary of key regulations in the SMP that would avoid, minimize, or mitigate potential impacts.

Section 4.4 includes these sections for each specific ocean resource use listed in the SMP.

Chapter 4 concludes, in Section 4.5, with a discussion of the potential beneficial effects of the Shoreline Restoration Plan.

4.1 Shoreline Environment Designations

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

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

Consistent with WAC Shoreline Master Program Guidelines, the county's environment designation system is based on the existing use pattern, the biological and physical character of the shoreline, and community interests. The Shoreline Analysis Report provided information on shoreline conditions and functions that informed the development of environment designations for each of the shoreline waterbodies. The proposed upland environment designations are as follows:

- High Intensity
- Shoreline Residential
- Rural Conservancy
- Natural
- Coastal Conservancy
- Willapa Bay Conservancy

Approximately 81 percent of all shoreland parcels occur in the Rural Conservancy or Willapa Conservancy environment designations. Shorelands in these designations also comprise the majority (85 percent) of undeveloped parcels in shoreline jurisdiction. A summary of the distribution of shoreland area among environment designations is provided in Figure 4-1.

The purpose of the **High Intensity** environment designation is to provide for high-intensity water-oriented commercial, transportation, and industrial uses while protecting existing ecological functions and restoring ecological functions in areas that have been previously degraded. The designation is appropriate for those shoreline areas owned or managed by the public Ports of Pacific County or other areas which support high-intensity uses related to

commerce, transportation, or navigation, or are suitable and planned for high-intensity water-oriented uses (e.g. Bay Center, Tokeland). Approximately 248 acres, or 0.6 percent of the county's shorelines, are designated High Intensity environment.

The purpose of the **Shoreline Residential** environment designation is to accommodate residential development and appurtenant structures, as well as to provide appropriate public access and recreational uses. The designation is appropriate for areas of more intense development that are predominantly single-family or multifamily residential development or are planned and platted for such. Approximately 184 acres, or 0.4 percent of the county's shorelines, are designated Shoreline Residential environment.

The purpose of the **Rural Conservancy** environment designation is to protect ecological functions, conserve natural resources and valuable historic and cultural areas in order to provide for sustained resource uses, achieve natural floodplain processes, and provide recreational opportunities. The designation is appropriate for those shoreline areas outside of incorporated municipalities and urban growth areas that currently support lesser-intensity resource-based uses such as agricultural or forestry uses, or low-density residential uses that are constrained by environmental factors such as steep slopes or floodplains. Approximately 25,282 acres, or 58.8 percent of the county's shorelines, are designated Rural Conservancy environment.

The purpose of the **Natural** environment designation is to protect those shoreline areas that are relatively undisturbed with intact or minimally degraded shoreline functions. The designation is appropriate for shoreline areas that are currently performing an important, irreplaceable function or ecosystem-wide process that would be damaged by human activity, and that therefore are unable to support new development or uses without significant adverse impacts to ecological functions or risk to human safety. Approximately 6,214 acres, or 14.4 percent of the county's shorelines, are designated Natural environment.

The purpose of the **Coastal Conservancy** environment designation is to protect to the highest degree possible and, where feasible, restore coastal ocean shorelands within the county; conserve wildlife; and manage the unique characteristics and resources of the marine shoreland areas of the county. The designation is appropriate for those shoreline areas landward of the ordinary high water mark (OHWM) on Pacific Ocean coastlines within the county, including beaches, dunes, wetlands, sediment sources, and/or cliffs. Approximately 1,569 acres, or 3.6 percent of the county's shorelines, are designated Coastal Conservancy environment.

The purpose of the **Willapa Bay Conservancy** environment designation is to protect to the highest degree possible and, where feasible, restore Willapa Bay shorelands; conserve wildlife; and manage the unique characteristics and resources of Willapa Bay shorelines. An additional purpose is to provide for the diverse uses of the interconnected shorelines within the Bay, which support aquaculture, residential, agriculture, forestry, and refuge/conservancy uses. The designation is appropriate for those shoreline areas adjacent to Willapa Bay. Approximately

9,508 acres, or 22.1 percent of the county's shorelines, are designated Willapa Bay Conservancy environment.

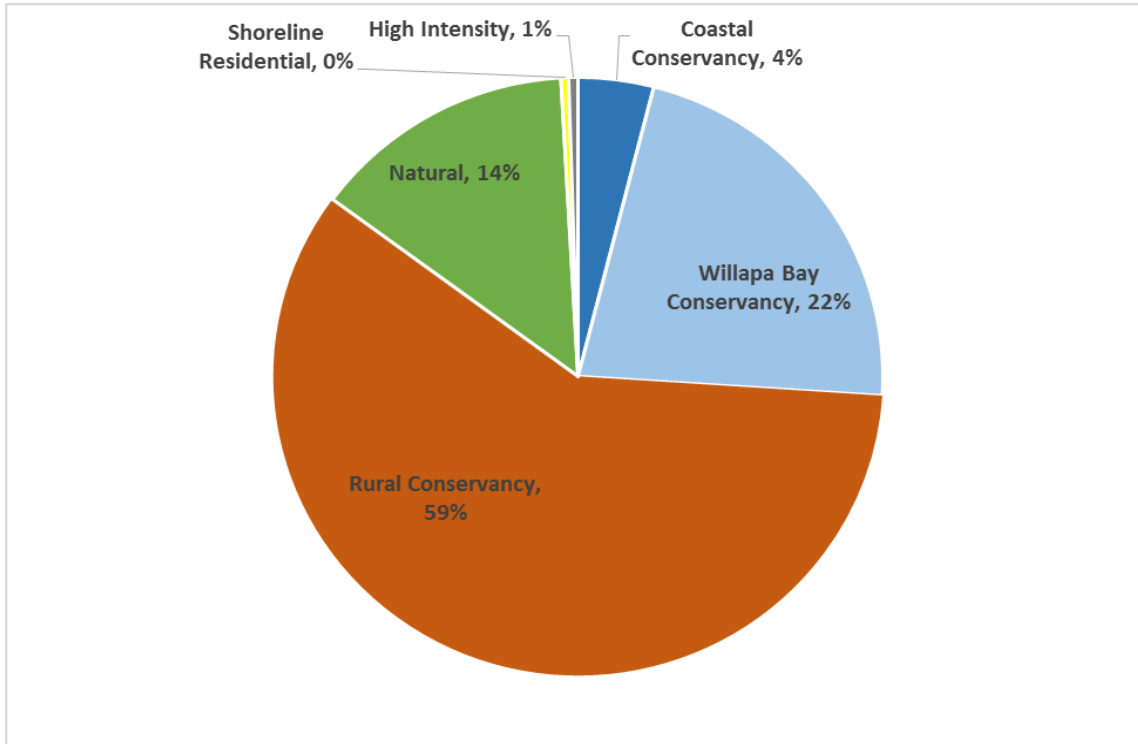


Figure 4-1 Distribution of upland environment designations on Pacific County shorelines.

In addition to the upland shoreline environment designations described above, the following environment designations are proposed for areas waterward of the OHWM:

- Freshwater Aquatic
- Coastal Ocean
- Coastal Ocean High Intensity
- Willapa Bay Estuary
- Columbia River Estuary

The Permitted Shoreline Uses and Modifications by Environment Designation table (SMP Table 5-1) identifies the prohibited and allowed uses and modifications in each of the shoreline environments, and clearly shows a hierarchy of higher-impacting uses and modifications being allowed in the already highly-altered shoreline environments, with uses more limited in the less developed areas either through prohibition or a requirement for a shoreline conditional use permit. The allowed and prohibited uses established in this table help minimize cumulative impacts by concentrating high intensity development activity in lower functioning areas that are less likely to experience significant function degradation with incremental increases in development. Additionally, allowed uses are subject to the general provisions of the SMP (see Section 4.2), as well as the provisions specific to that use or modification (see Sections 4.3 and

4.4). These provisions are intended to minimize adverse impacts from shoreline uses, and help ensure that such uses result in no net loss of ecological functions.

4.1.1 Potential Use Conflicts

In general, the proposed SMP includes prohibited and permitted uses specific to environment designations that limit potential conflicts between neighboring uses and ensure that uses are consistent with comprehensive plans and zoning.

Although there is potential for future use conflict, particularly in land use zones that provide a wide variety of land uses, the proposed SMP provides guidance and a regulatory framework that helps minimize or avoid future use conflicts in shoreline jurisdiction. Similarly, the proposed SMP provides a framework for allowing and/or encouraging shoreline preferred uses in the shoreline jurisdiction.

4.2 General Shoreline Regulations

4.2.1 Environmental protection and critical areas

Mitigation Sequencing

The proposed SMP includes general regulations requiring projects to be designed, located, sized, constructed and maintained to achieve no net loss of shoreline ecological functions. The mitigation sequence is a series of measures that can be applied to a project to ensure that it achieves no net loss of ecological function (4.2.B.4). Mitigation sequencing applies to all projects in shoreline jurisdiction.

For some development activities, provisions in the SMP stipulate specific, objective standards for avoiding impacts (e.g. placement), minimizing impacts (e.g. size), and compensating for unavoidable impacts (e.g. planting requirements). If a proposed shoreline use or development is entirely addressed by such standards, then further mitigation sequencing analysis is not required.

However, in the following situations, applicants must provide an analysis of how the project will follow the mitigation sequence:

- If a proposed shoreline use or modification is addressed in any part by discretionary standards (such as standards requiring a particular action “if feasible” or requiring the minimization of development size) contained in the shoreline regulations, then the mitigation sequence analysis is required for the discretionary standard(s).
- When an action requires a Shoreline Conditional Use Permit or Shoreline Variance Permit.
- When specifically required by a provision in the SMP.

The application of mitigation sequencing standards and specific objective standards will help ensure that shoreline uses and modifications achieve no net loss of shoreline ecological functions.

Shoreline Critical Areas

The proposed SMP incorporates by reference the Pacific County Critical Areas and Resource Lands (CARL) Ordinance. The county updated the CARL to better align with best available science in August of 2016. Regulations in the CARL apply to wetlands, fish and wildlife habitat conservation areas, geologically hazardous areas, critical aquifer recharge areas, and frequently flooded areas.

In the CARL, all waters of the state are included as fish and wildlife habitat conservation areas, and therefore fish and wildlife habitat conservation area buffers apply to all shoreline areas. Shoreline buffer and building setback widths are defined by environment designation in the SMP (SMP Table 5-2). A comparison of proposed and existing shoreline buffers and building setback distances by environment designation for the High Intensity, Shoreline Residential, Rural Conservancy, and Willapa Conservancy environments is provided in Table 4-1. The Coastal Conservancy environment was not included in this analysis because variable shoreline setbacks in the draft SMP were specifically designed to meet the existing pattern of development in that environment. The Natural environment was also excluded because very few parcels in the Natural environment have any developed infrastructure.

In order to evaluate existing development patterns, only improved shoreline parcels were included in the comparison. These were defined as parcels with an assessed building value greater than zero (i.e. with one or more structures), which are adjacent to a shoreline and not separated from the shoreline by a road or another developed parcel. Due to the smaller lot sizes in both the High Intensity and Shoreline Residential environments, many lots are separated from the shoreline by a road or by other developed parcels. On Willapa Bay, many lots are separated from the shoreline by U.S. Highway 101 and State Route 105, which run parallel to the shoreline along much of the bay.

Sampled parcels were selected using a random number generator. The number of sampled parcels was determined based on the total number of improved parcels in the environment designation. At least 80 parcels were sampled from each environment designation, with the exception that only 65 developed parcels met the sampling criteria in the High Intensity environment designation. The total percentage of subsampled parcels ranges from six percent for Rural Conservancy parcels to 45 percent for High Intensity parcels of all parcels in shoreline jurisdiction. When only considering those parcels within shoreline jurisdiction that are adjacent to the shoreline, the subsampled percentage is higher.

For each parcel, the width of unimproved vegetation (including emergent and forested vegetation and excluding lawn and other landscaped or mowed vegetation) and the distance to the waterward-most building were measured using satellite imagery. All distances in Table 4-1 were measured in feet relative to the OHWM, except for parcels on the eastern portion of the Long Beach Peninsula; buffers and setbacks in this area were measured in feet relative to the Highest Astronomical Tide (HAT), as mapped by The Nature Conservancy (2016), as directed under the draft SMP. The analysis assumed a maximum possible buffer or total setback distance

of 200 feet, which generally represents the extent of shoreline jurisdiction; this reduced the potential for existing broad expanses of vegetation to skew the mean upward.

Table 4-1. Comparison of proposed and existing vegetated buffers and total setback distances.

Environment Designation	Proposed		Existing Improved Parcels			Percent (Number) Improved Parcels
	Buffer Width	Combined Buffer and Setback Width	Vegetated Buffer Distance Median (Mean ± 95% Confidence Interval)	Distance to Nearest Building Median (Mean ± 95% Confidence Interval)	Sample Size	
High Intensity ²	10	35	0 (60±20)	106 (101 ±21)	63	47% (146)
Shoreline Residential	25/50 ¹	40/65	0 (11±6)	70 (89±13)	80	65% (479)
Rural Conservancy	130	145	96 (111±23)	176 (146±13)	83	38% (1,370)
Willapa Bay Conservancy	75	90	66 (87±14)	158 (139±11)	125	22% (823)
Eastern Long Beach ² Peninsula			24 (47±27)	108(148±38)	36	
Other			112 (106±16)	176 (146±13)	89	

¹ 50-foot buffer for natural streams, rivers, and lakes; 25-foot buffer for man-made canals and lakes.

² Parcels along the eastern side of the Long Beach Peninsula are measured relative to the Highest Astronomical Tide, as mapped by The Nature Conservancy (TNC 2016).

The following conclusions are drawn from the summary statistics in Table 4-1:

- Intact vegetated buffers are typically absent from existing developed parcels in the High Intensity and Shoreline Residential environments. In most cases, these shoreline areas are fronted by levees, which disrupt potential buffer functions. The proposed buffers for these environments are generally consistent with existing conditions.
- Proposed buffers in the Rural Conservancy environment are slightly higher than existing vegetated conditions on developed parcels. This is appropriate to maintain ecological functions given the high percentage of unimproved parcels in this environment designation.
- On average, existing building setback distances exceed the proposed total distance for a combined vegetated buffer and building setback.
- In the Willapa Bay Conservancy environment, both measured and existing vegetated buffers and setbacks are lower on the eastern Long Beach Peninsula, where distances are measured from the HAT instead of the OHWM, compared to elsewhere in the Willapa Bay Conservancy environment.

As shown in Table 4-1, the proposed buffer width of 75 feet in the Willapa Bay Conservancy environment is generally consistent with the average condition of undisturbed vegetation on

improved parcels bay-wide. However, the majority (88 percent) of parcels in Willapa Bay Conservancy are unimproved, and the above analysis does not explicitly measure conditions on these parcels. Assuming that unimproved parcels are relatively undisturbed, new development on those unimproved parcels could potentially reduce existing buffer conditions. However, as noted in Section 3.2, approximately 82 percent of vacant parcels in Willapa Bay Conservancy contain wetlands. Specifically, saltmarsh wetlands are present along the majority of Willapa Bay shorelines. The CARL incorporates the most recent guidance from Ecology related to wetland buffers, which incorporate estuarine wetland buffers ranging from 75-200 feet. These wetlands and their required buffers would likely present additional buffer encumbrances on future shoreline development in the Willapa Bay Conservancy environment. In addition to the mitigation sequencing requirements of the draft SMP, wetland buffer standards would help to ensure that shoreline ecological functions are maintained.

In addition to shoreline buffers, a marine and estuarine water quality protection zone in the CARL applies water quality protection standards to areas within 300 feet of the OHWM or HAT, depending on location, of marine and estuarine waters. These standards help to ensure that on-site sewage systems are constructed and maintained to protect water quality, and that new livestock facilities use best management practices to minimize impacts to water quality.

CARL standards applicable to geologically hazardous areas limit future development in erosion and landslide hazard areas, and ensure that land use practices do not exacerbate these hazards or their ecological impacts. The CARL designates both the North Cove “Wash-Away” Beach area and Coastal High Hazard Areas mapped by FEMA (Flood Zones V and VE), as Shoreline Erosion Hazard Areas. Within these areas, the CARL limits new development with a permanent foundation to areas beyond what is expected to erode in the next thirty years.

Standards for critical aquifer recharge areas apply to most soils found on the Long Beach Peninsula and North Beach coastal areas. Standards restrict the type of permitted development, and provide standards for on-site sewage and stormwater collection, treatment, and disposal within critical aquifer recharge areas.

4.2.2 Flood hazard management

As described in Section 2.4.1 above, climate change and sea level rise are expected to increase coastal flooding. This may increase future demand for flood hazard management facilities. Per Section 4.4 of the proposed SMP, uses and activities within the channel migration zone and floodway are limited to restoration, redevelopment of existing legal structures and uses, forest practices, ongoing agricultural practices, mining, and transportation or other public utility development where no other feasible alternative exists (SMP 4.4.B.2). New structural flood hazard reduction measures must assure no net loss of ecological functions (SMP 4.4.B.6.a.). Development and subdivision of land is not allowed in floodways, channel migration zones, or coastal flooding zones if flood hazard reduction measures would be necessitated (SMP 4.4.B.1).

4.2.3 Vegetation management

In addition to vegetation management regulations contained in the CARL, the proposed SMP includes shoreline vegetation conservation standards in Section 4.5. The section requires that vegetation clearing be limited to the minimum necessary, and that any adverse impacts from vegetation removal be mitigated in accordance with the SMP's mitigation sequencing requirements (SMP 4.5.B.1. and 3., respectively). Native trees must be replaced at a ratio of two to one (SMP 4.5.B.5.).

4.2.4 Water quality

The proposed SMP would require that all shoreline uses and activities incorporate measures to protect and maintain surface and groundwater quality and quantity, and to control erosion, including those measures in the Department of Ecology's Stormwater Management Manual (SMP Section 4.6.B.1). It also defines standards for materials that come into contact with water as well as for the bulk storage of oil and other chemicals (SMP Section 4.6.B.2 - 4). Sewage disposal facilities, including on-site sewage systems, must meet all applicable state and local regulations, and drainfields shall only be located on lots with suitable physical characteristics (SMP Section 4.6.B.5).

4.3 Shoreline Use and Modification Provisions

The following two sections (4.3 and 4.4) provide a brief summary of the primary potential ecological impacts that may arise from various shoreline uses, shoreline modifications, and ocean uses, as well as a summary of the proposed SMP regulations intended to conserve ecological functions and prevent adverse cumulative impacts. The sections are organized according to the document structure of the proposed SMP. Where appropriate, tables are included to summarize potential impacts and key provisions in the proposed SMP that address those impacts.

Regulations that help ensure that impacts are avoided, minimized, and mitigated can be separated into the following three general categories: (1) provisions that allow, condition, or prohibit specific types of development depending on Shoreline Environment Designation; (2) provisions that apply specific standards that help avoid and minimize potential impacts; and (3) provisions that require mitigation of impacts and/or demonstration of no net loss of functions.

The potential impacts described in the sections below account for the more significant or most likely impacts, but may not account for the full suite of potential impacts from a given use or modification. These less significant or less likely impacts, while not specifically discussed below, would be addressed during the permitting process through mitigation sequencing requirements. Also, the listing of potential impacts does not mean that these impacts occur in every instance of a certain use or modification.

4.3.1 General shoreline uses

Sections 5.2 and 5.3 of the proposed SMP includes general standards applicable to all shoreline uses and modifications. Dimensional standards, including shoreline buffers and setbacks for non-water-dependent uses, minimum shoreline frontage widths, and maximum impervious surface areas, are defined by environment designation in SMP Table 5-2. As with the permitted and prohibited uses within each environment designation, these provisions ensure that ecologically intact shorelines receive maximum protection from development impacts. SMP 5.3.B.2 requires that all new development be located and designed to avoid the need for future shoreline stabilization and dredging to the extent feasible, and SMP 5.3.B.3 requires that new development be located and designed to ensure no net loss of ecological functions. SMP 5.3.B.5 includes several provisions intended to protect water quality near aquaculture areas.

4.3.2 Agriculture

Ongoing agricultural activities and areas designated as agricultural lands are exempt under the proposed SMP, though new and expanded agricultural uses and developments are not exempt. Nearly 10 percent of the County’s shoreline area is in agricultural use. There is some potential for new agricultural development. In the incorporated City of Raymond, development of marijuana production facilities on Port properties is planned or occurring. Marijuana production may create a demand for new agricultural facilities in unincorporated areas of the County as well.

Potential impacts from agriculture are summarized below in Table 4-2. Key regulations in the proposed SMP that address potential impacts from agriculture are listed below in Table 4-3. These regulations apply to new or expanded agricultural uses and developments on land not meeting the definition of agricultural land (SMP Section 5.4.B.3).

Table 4-2. Summary of potential impacts from agriculture.

Functions	Potential Impacts to Functions
Hydrologic	Agricultural irrigation from wells may affect ground water.
	Direct irrigation withdrawals may affect base flows.
Water Quality	Increased erosion from removal of trees or tilling of soil.
	Potential for livestock waste, pesticides, herbicides, and fertilizers to enter waterbodies through runoff.
Vegetative/ Habitat	Reduction in forest cover associated with conversion of lands to agricultural uses.

Table 4-3. Summary of key agriculture regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Agriculture (5.4.B.)	Shall be located and designed to ensure no net loss of ecological functions and no significant adverse impact on other shoreline resources and values. (3.a.)
	Provide vegetated buffers between agricultural activities and waterbodies to

Location in SMP	Key Provision Providing Protection of Ecological Functions
	prevent nutrients from entering the waterbody. (3.b.)
	Feedlot operations and animal waste retention and storage areas shall not be located within shoreline jurisdiction unless direct manure runoff is prevented. (3.c.)
	Apply, where applicable, operational guidelines for agricultural nonpoint source pollution, as found in EPA's National Management Measure to Control Nonpoint Source Pollution from Agriculture. (3.d.)
	Develop, where applicable, a Comprehensive Nutrient Management Plan according to the Technical Criteria set forth in the USDA National Instruction. (3.e.)
	Apply minimum standards to the application of chemical, including pesticides, herbicides, and fertilizers. (3.f.)

4.3.3 Aquaculture

Ongoing aquaculture uses are not subject to the SMP. New or expanded aquaculture activities require shoreline approval.

Table 4-4. Summary of potential impacts from aquaculture.

Functions	Potential Impacts to Functions
Hydrologic	Alteration in hydrologic and sediment processes associated with aquaculture structures.
Water Quality	Reduction in phytoplankton concentrations through bivalve filtration.
Vegetative/ Habitat	Creation of habitat structure for epibenthic invertebrates and fish.
	Reduction in density of eelgrass, but increasing growth rate and size.
	Accidental introduction of non-native species.

Table 4-5. Summary of key aquaculture regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Table 5-1 provides a detailed breakdown of aquaculture activities which are permitted, conditionally permitted, or prohibited by shoreline environment designation in order to protect ecological functions. Please refer to SMP draft.
Aquaculture (5.5.B.)	Shall be designed, located, and operated to prevent the spread of disease to native aquatic life; prevent the establishment of new nonnative species that cause significant ecological impacts; and minimize impacts to native eelgrass and macroalgae. (2.)
	Commercial geoduck aquaculture shall be allowed only where sediments, topography, land, and water access support geoduck aquaculture operations without significant clearing or grading. (3.)
	In freshwater environments, net-pens shall be allowed for the purpose of salmonid enhancement only provided that artificial feeding is prohibited. (4.)

Location in SMP	Key Provision Providing Protection of Ecological Functions
	New aquaculture activities shall comply with the chemical application regulations for Agriculture, SMP Section 5.4(B.3.f.). (5.)

4.3.4 Boating facilities and mooring structures

Boating facilities and mooring structures are predominantly concentrated in the estuarine waters of Willapa Bay and the Columbia River. Overwater structures are particularly concentrated in areas designated as high intensity environments, such as Tokeland, Bay Center, Port of Peninsula in Willapa Bay, and the Coast Guard Training Center on the Columbia River. More sparsely distributed overwater structures occur along Willapa Bay, and these are generally associated with aquacultural uses. This type of concentrated distribution of overwater structures is expected to be maintained in the future.

Table 4-6. Summary of potential impacts from boating facilities and mooring structures.

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

Table 4-7. Summary of key boating facilities regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Table 5-1 provides a detailed breakdown of boating facilities which are permitted, conditionally permitted, or prohibited by shoreline environment designation in order to protect ecological functions. Please refer to SMP draft.
Boating Facilities and Mooring Structures: General provisions (5.6.B.)	Structures and uses shall not be permitted in: marshes, estuaries, or other wetlands; spawning and holding areas for priority anadromous or priority resident fish; critical saltwater habitats; channel migration zones; areas where a flood hazard will be created and cannot be mitigated; or areas where impacts to shoreline ecological functions and processes cannot be mitigated, unless there is demonstrated public need or an alternative is not feasible, and the project, including any required mitigation, will result in no net loss of ecological functions. (2.)
	New boating facilities and mooring structures shall: minimize the area of water covered; minimize the need for new maintenance dredging; avoid, minimize, and mitigate potential adverse impacts to shoreline ecological functions consistent

Location in SMP	Key Provision Providing Protection of Ecological Functions
	<p>with mitigation sequencing; prevent scour; avoid using skirting; and prevent grounding. (3.)</p> <p>If any of the following are proposed during a five-year period, the project shall be considered a new facility: replacement of the entire facility, or replacement of 75 percent or more of support piles or boat launch area. (4.)</p> <p>Applicants must demonstrate a need for modification or enlargement due to increased or changed use or demand, safety concerns, or inadequate water depth. (5.)</p> <p>Repairs to existing boating facilities shall utilize material standards specified for new facilities. (6.)</p>
<p>Boating Facilities and Mooring Structures: Docks, Piers, and Floats (5.6.B.7.)</p>	<p>New docks shall be permitted only for water-dependent uses or public access, and shall be restricted to the minimum size necessary. (a. and b.)</p> <p>Measures to avoid and minimize impacts to ecological functions shall be implemented to the maximum extent feasible. (c.)</p> <p>Floats shall be located in areas of minimal currents and wave action and shall not rest on the bottom. Floating structures shall be sited to prevent damage to natural vegetation. (d.)</p> <p>Shall be designed so that adverse hydraulic effects at the site and in adjacent areas are minimized. (e.)</p> <p>The lengths of docks accessory to residential use/development shall be no greater than that required for safety and practicality for the residential use. The maximum length shall be limited to either 60 feet or the length necessary to provide a minimum of 6 feet water depth. The maximum width for residential docks shall be 6 feet. The maximum width for residential floats shall be 8 feet. Dock, pier, and float facilities for new residential development of two or more dwellings shall be joint use. (g.)</p>
<p>Boating Facilities and Mooring Structures: Launch Ramps (5.6.B.8.)</p>	<p>A launch ramp is allowed only if it provides access to waters that are not adequately served by existing access facilities. (a.)</p> <p>A launch ramp shall be located to minimize the obstruction of currents, alteration of sediment transport, and accumulation of drift logs and debris; where there is adequate water mixing and flushing; where it will not adversely affect flood channel capacity or otherwise create a flood hazard; or where water depths are adequate to eliminate or minimize the need for dredging or filling. (b.)</p>
<p>Boating Facilities and Mooring Structures: Marinas (5.6.B.9.)</p>	<p>Sewage pump-out and treatment facilities shall be installed at the beginning of operations of any new marina or of an expansion to an existing marina, unless similar sewage treatment facilities exist within 2,000 feet of the marina. (b.)</p> <p>The amount of water surface occupied shall be the minimum required. New facilities shall make maximum feasible use of dry land boat moorage. (c.)</p> <p>Means for preventing oil, fuel, and other contaminants from entering the water shall be provided, including shoreland facilities for public dumping of oil and emptying of holding tanks. (d.)</p> <p>New marina facilities shall be located in areas where there is natural or man-made protection from wind, waves, tidal currents, storms, and passing ship wakes. Marinas shall be located or designed to minimize adverse effects on the natural processes of erosion, sediment transport and/or beach accretion. (e.)</p>

Location in SMP	Key Provision Providing Protection of Ecological Functions
	Parking shall be located as far landward as is feasible and preferably outside of shoreline jurisdiction. (f.)
	An analysis shall be submitted which shows that existing facilities are fully utilized, impractical, or will not satisfy a specific need. (g.)
	Marinas are permitted to moor liveaboard vessels provided that the areas proposed for liveboards include properly-planned and designed utility connections and storage facilities for each slip, and that no more than ten percent of the surface area of the marina or ten percent of the slips, whichever is less, is devoted to liveaboard vessels. (i.)

4.3.5 Breakwaters, jetties, groins, and weirs

Existing breakwaters, jetties, groins, and weirs play significant roles in maintaining aquatic uses in Pacific County. Jetties on the Columbia River support navigation, breakwaters protect marinas, and groins are integrated into shoreline stabilization structures. Weirs are present in several of the river systems of the county. Maintenance and repair of these structures is anticipated. New facilities, although not commonly anticipated, may be necessitated to protect public, commercial, and industrial infrastructure and ongoing navigational uses.

Table 4-8. Summary of potential impacts from breakwaters, jetties, groins, and weirs.

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

Table 4-9. Summary of key breakwaters, jetties, groins, and weirs regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Prohibited on all lakes. Fixed structures prohibited on all marine/river shorelines outside of the High Intensity and Coastal Conservancy environments. Floating structures prohibited on all marine/river shorelines outside of the Rural Conservancy and High Intensity environments. Groins and pile dikes prohibited in the Natural and Shoreline Residential environments.
Breakwaters, Jetties, Groins, and Weirs (5.7.B.)	New, expanded, or replacement structures shall only be allowed if it can be demonstrated that they will not result in a net loss of shoreline ecological functions, and that they support water-dependent uses, public access, shoreline stabilization, or other specific public purpose. (1.)
	Shall be limited to the minimum size necessary. (2.)
	Shall implement mitigation sequencing to achieve no net loss of ecological functions. (3.)
	The builder of any shoreline protection structure shall be responsible for

Location in SMP	Key Provision Providing Protection of Ecological Functions
	determining in advance the nature and extent of any possible adverse effects on the property of others caused by his construction and shall propose and take all necessary actions to avoid and minimize such effects. (4.)
	Open-pile, floating, portable, or submerged breakwaters, or several smaller discontinuous structures that are anchored in place, shall be preferred over fixed breakwaters. (5.)
	Proposed designs for new or expanded structures shall be designed by qualified professionals. (6.)
	On Columbia River Estuary shorelines, bankline and streambed alterations shall meander and maintain stream surface area and make maximum use of natural or existing deepwater channels. (7.)

4.3.6 Commercial and institutional development

Commercial development is concentrated in existing areas designated as High Intensity environments. This pattern of development is anticipated to continue in the future. Under the proposed SMP, new institutional uses must comply with regulations for commercial development (SMP 5.14.B.1).

Table 4-10. Summary of potential impacts from commercial and institutional development.

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

Table 4-11. Summary of key commercial and institutional development regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Commercial development is prohibited in the Natural and Coastal Conservancy environments. Nonwater-oriented commercial development prohibited outside the High Intensity environments.
	Non-water-oriented institutional development is prohibited in the Natural, Rural Conservancy, Coastal Conservancy, and Willapa Bay Conservancy environments, and in all aquatic environments. Water-oriented institutional development is prohibited in the Coastal Ocean and Coastal Ocean High

Location in SMP	Key Provision Providing Protection of Ecological Functions
	intensity environments and is a conditional use in all other environments.
Commercial Development (5.8.B.)	Nonwater-oriented commercial uses shall be prohibited outside of High Intensity shorelines unless part of a mixed-use project that includes water-dependent uses and provides a significant public benefit such as public access and/or ecological restoration; or navigability is severely limited at the proposed site and the use provides a significant public benefit; or where physically separated from the shoreline by another property or public right-of-way. (2.)
	Nonwater-dependent commercial uses shall be prohibited over water except in existing structures or in the limited instances where they are auxiliary to and necessary in support of water-dependent uses. (3.)
	Shall be located, designed, and operated to result in no net loss of shoreline ecological functions in accordance with SMP mitigation sequencing provisions. (4.)
	On the Columbia River Estuary, commercial uses situated over the water shall be located in areas of minimal currents or wave actions. Floating structures shall be sited to prevent damage to natural vegetation and shall not rest on the bottom. (8.)
Institutional Development (5.14.B.)	Regulations for commercial development shall apply to institutional development. (5.14.B.1.)

4.3.7 Dredging and dredge material disposal

Numerous sites throughout Pacific County are dredged and maintained on a regular basis; in Willapa Bay, these sites include the Tokeland Marina, Bay Center Marina, Raymond City dock, and others. Regular maintenance dredging is required to maintain a navigation channel to the Port of Chinook Marina, the Coast Guard training facility, the Port of Ilwaco, and the public boat yard at Cape Disappointment. The Corps maintains a federal navigation channel from the main channel in the Columbia River through Baker Bay and to the ports of Ilwaco and Chinook. The Ilwaco channel is maintained at 17 feet depth and the Chinook Channel is maintained to a depth of 10 feet per Corps authorization (Corps 2009).

Dredge disposal locations around Willapa Bay include Cape Shoalwater and Goose Point, both dispersive disposal sites (Dredged Material Management Program 2006). Several flow lane disposal sites have been identified and permitted for placement of suitable dredged sediment in Willapa Bay and the Willapa River. Two of these sites, Tokeland Marina and Bay Center flow lane sites, have been successfully used and monitored.

The Port of Ilwaco conducts regular maintenance dredging work at the Port of Ilwaco marina and marina approaches. The dredged material from the marina recently has been placed at an upland disposal site; however, the capacity of this upland disposal site has been exhausted. Alternatives under consideration include extension of the existing site and/or developing a new flow lane placement site. One approach may include the extension the historic West Sand Island dredge disposal site. This site has been permitted in the past and is the leading candidate site

for future port disposal, but would require collaboration of all constituents including the Lower Columbia River Solutions Group.

See Ocean Disposal (Section 4.4.2) for more discussion of dredge disposal.

Table 4-12. Summary of potential impacts from dredging and dredge material disposal.

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

Table 4-13. Summary of key dredging regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Upland dredge material disposal is prohibited in the Natural, Rural Conservancy, and Willapa Bay Conservancy environments. Dredging is a conditional use in all aquatic environments unless associated with restoration.
Dredging and Dredge Material Disposal: General Requirements (5.9.B.1.)	Shall be done in a manner which avoids or minimizes significant ecological or ecosystem impacts, and impacts which cannot be avoided shall be mitigated in a manner that assures no net loss of shoreline ecological functions. (a.)
	New development shall be sited and designed to avoid or minimize the need for new and maintenance dredging. (c.)
	Erosion, sedimentation, increased flood hazard, and other undesirable changes in circulation shall be avoided. Tidal marshes, tidal flats, and other wetlands shall not be adversely affected. (e.)
	Timing of dredging and dredged material disposal in aquatic areas shall occur during periods of adequate river flow. (f.)
	Dredging and dredge disposal shall be scheduled to minimize impacts to biological productivity. (g.)
Dredging and Dredge Material Disposal: Dredging (5.9.B.2.)	Shall be permitted only for specific purposes listed. (a.)
	Dredging for the primary purpose of obtaining fill is permitted only when necessary for restoration. (b.)
	Shall be the minimum necessary to accomplish the proposed use. (c.)
	Maintenance dredging shall be restricted to previously authorized locations, depths, and widths. (d.)
Dredging and Dredge Material Disposal: Dredge Material Disposal (5.9.B.3.)	Shall be permitted only where it is demonstrated that it will not result in significant or ongoing adverse impacts to shoreline ecological functions, and that any unavoidable impacts are minimized and mitigated to ensure no net loss. (a.)
	Upland disposal of dredge materials shall be located to minimize detrimental effects on the shoreline environment, particularly wetlands; shall control surface runoff to protect water quality; and shall ensure revegetation following termination of disposal activity. (b.)

Location in SMP	Key Provision Providing Protection of Ecological Functions
	Aquatic disposal shall only be permitted in limited circumstances (listed.) (c.)
	Aquatic disposal, when allowed, shall demonstrate appropriate sediment size and chemistry, and shall demonstrate that flow lane disposal sites shall avoid and minimize effects to benthic productivity. (d.)
	Dredge spoils exceeding the Environmental Protection Agency criteria for toxic sediments shall be disposed of in an approved upland location. The results of chemical and physical analysis of the spoil material shall be forwarded to the Administrator prior to the beginning of dredging operations and at regular intervals thereafter to ensure water and sediment quality. (e.)
	Disposal of dredge material within wetlands or within a river's channel migration zone shall be allowed only when proposed as part of an ecological restoration project demonstrated by a qualified professional to improve wildlife habitat or otherwise restore ecological functions. (f.)

4.3.8 Dune modification

Coastal sand dunes provide a number of important functions, including protected habitat for shorebirds and wildlife, groundwater recharge, water quality protection, physical backshore protection, and recreation (City of Long Beach 2000). The SMP recognizes both the value of stabilized coastal dunes for shoreline protection of developed residential areas, as well as the ecological value of sand dunes with a patchwork mosaic of native dune grasses and forbes for sensitive species. Dune modification is permitted and encouraged for the purpose of ecological restoration in undeveloped areas, but dune modification in residential areas is limited by the SMP provisions.

Table 4-14. Summary of potential impacts from dune modification.

Functions	Potential Impacts to Functions
Hydrologic	Increase erosion from removal of foredune vegetation
	Alteration of hydrologic and sediment processes.
Water Quality	Groundwater contamination from surface or aquifer contaminants.
	Reduction in groundwater recharge; saltwater intrusion.
Vegetative/ Habitat	Reduction in habitat function through loss of interdunal wetlands, foredune vegetation.
	Reduced storm buffer function.

Table 4-15. Summary of key dune modification regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Dune modification is prohibited in the Natural environment and is a conditional use in all other environments, unless performed for the purpose of ecological restoration.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Dune Modification (5.10.B.)	Dune modification to protect water views shall be allowed landward of the primary dune buffer and only on properties subdivided and developed prior to the adoption of the SMP. Such modifications shall only be allowed where the view is completely obstructed for residences or water-enjoyment uses and where it can be demonstrated that the dunes did not obstruct views at the time of original occupancy. (1.b.)
	A protective strip of dune land, or buffer, shall apply along all ocean beaches in the Coastal Ocean designation. Dune modification within the inner 100 feet of the buffer is prohibited except for ecological restoration, where it is demonstrated that the proposed action will not decrease protection of inland development; and to provide access across the buffer when necessary. Outside of the inner 100 feet of the buffer, public recreational trails and vegetation removal for the purpose of maintenance, fire protection, or invasive species management are permitted provided that such activities do not result in adverse impacts to shoreline ecological functions. (2.)
	Dune modification shall not result in a net loss of shoreline ecological functions. If vegetation is removed or disturbed, it shall be replanted with native dune vegetation within one growing season. (3.)
	A building setback line shall be established easterly from the primary dune buffer, within which all structures shall be prohibited. (4.)

4.3.9 Fill and excavation

Historical fill activities along Willapa Bay, the lower reaches of rivers, and the Columbia River have reduced ecological functions of these areas. The proposed SMP significantly limits potential for new fill activities waterward of the OHWM.

Table 4-16. Summary of potential impacts from fill and excavation.

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

Table 4-17. Summary of key fill and excavation regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Fill and excavation are conditional uses in the Natural, Coastal Conservancy, Willapa Bay Conservancy, and all aquatic environments.
Fill,	Shall be located, designed, and constructed to protect shoreline ecological

Location in SMP	Key Provision Providing Protection of Ecological Functions
Excavation and Grading (5.11.B.)	functions and ecosystem-wide processes, including channel migration; and shall be the minimum necessary to accomplish the proposed use. (1.)
	Fill in aquatic areas shall only be permitted if required in conjunction with a permitted water-dependent use, public access, cleanup of contaminated sediments, dredge material disposal, expansion or alteration of transportation facilities of statewide significance, or an approved restoration project. (3.)
	Shall consist of clean materials with a minimum potential for degrading water quality. (4.)
	Fill areas shall be protected against erosion with retaining walls or similar structures or by vegetation established, if possible, during the first growing season following completion of the fill. (5.)
	Filling in associated wetlands or waterward of the OHWM to provide for drainfields or to meet setback requirements is prohibited. (6.)
	Where structures are permitted overwater, structures supported by pilings are preferred over fills. (7.)
	Excavation of previously deposited dredge spoils above the OHWM may be permitted if the spoils site is part of a dredge materials management plan and the spoils were not originally placed as part of a beach nourishment or other shoreline restoration project. (8.)
	On High Intensity shorelines, creation of new water surface area shall only be allowed in conjunction with navigation uses, water-dependent development, or restoration. Water quality degradation shall be minimized, and sediments and materials shall be deposited on land. The maximum feasible amount of new water surface area shall be excavated as an upland site behind protective berms. Excavation shall not result in channelization of the waterway. On all other shoreline areas, creation of new water surface area shall be allowed only in conjunction with a restoration action. (9.)

4.3.10 Forest practices

Ongoing forest practices are not regulated under the SMP. The conversion of existing forest uses to non-forest uses is anticipated to occur more commonly than new forest uses. However, since development pressure is limited, as described in Section 3, these forest conversions are also not commonly anticipated.

Table 4-18. Summary of potential impacts from forest practices.

Functions	Potential Impacts to Functions
Hydrologic	Reduced infiltration associated with forestry actions resulting in flashier hydrology.
	Increase in stormwater runoff and discharge in association with more impervious surfaces from non-forestry uses following conversion.
Water Quality	Increased erosion from removal of trees.
	Greater potential for increased erosion, bank instability, and turbidity associated with vegetation clearing.
	Increase in contaminants associated with the creation of new impervious

	surfaces (e.g. metals, petroleum hydrocarbons) for non-forestry uses following conversion.
Vegetative/ Habitat	Reduction in forest cover associated with conversion of lands from forestry uses.
	Loss of or disturbance to riparian habitat during upland development.

Table 4-19. Summary of key forest practices regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Forest practices are a conditional use in the Natural environment.
Forest Practices (5.12.B.)	Harvesting of timber is prohibited on Natural shorelines unless proven necessary to preserve a desired, early successional species; prevent an epidemic; or clean up and restore an area devastated by disaster. (1.)
	Only selective commercial timber cutting is permitted within 200 feet of Shorelines of Statewide Significance, so that no more than 30 percent of the merchantable trees may be harvested in any ten year period of time. (3.)
	The application of chemicals through aerial sprays or other means which result in extensive drift shall be prohibited. (5.)

4.3.11 Industrial development

Industrial development is generally limited throughout the county, and where it does occur, it is concentrated in areas designated as High Intensity environments. Future development of new industrial uses in shoreline jurisdiction is expected to remain infrequent, and given SMP preferences, water-dependent uses are expected to be most common. Future industrial development is expected to occur in those areas designated as High Intensity environments.

Table 4-20. Summary of potential impacts from industrial development.

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

Table 4-21. Summary of key industrial development regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Industrial development is prohibited on Natural, Shoreline Residential, and Coastal Conservancy shorelines, as well as Coastal Ocean and Coastal Ocean High Intensity aquatic environments.
Industrial Development (5.13.B.)	Shall be located, designed, and constructed in a manner that minimizes adverse impacts to shoreline resources, and shall include mitigation to ensure no net loss of shoreline ecological functions and processes. (1.)
	New nonwater-oriented industrial development is permitted only when part of a mixed-use project that includes water-dependent uses and provides public access and/or ecological restoration, or navigability is severely limited and the development provides public access and/or ecological restoration, or where the site is physically separated from the shoreline by another property or right-of-way. (4.)
	Industrial uses over the water shall be located in areas of minimal currents and wave action. Floating structures shall be sited in order to prevent damage to natural vegetation and shall not rest on the bottom. (6.)
	Removal of riparian vegetation shall be permitted only where direct access to water is required for an approved water-dependent use. (7.)
	Water storage of logs is prohibited on Columbia River Estuary shorelines. It shall only be permitted elsewhere where no feasible dry land storage is available, state water quality standards can be met, and Ecology BMPs for operations are followed. (8.)
	<p>Hazardous bulk storage, including nuclear facilities, shall not be located in known historical Cascadia Subduction Zone inundation areas. (10.)</p> <p>Handling of hazardous materials shall follow specific provisions to ensure safety and prevention of spills. (11.)</p>

4.3.12 In-water structures

Dams are relatively rare within shoreline jurisdiction in Pacific County. The modification and repair of existing dam and diversion infrastructure could be anticipated on an infrequent basis; however, new dams are generally not anticipated.

Table 4-22. Summary of potential impacts from in-water structures.

Functions	Potential Impacts to Functions
Hydrologic	Alteration in flows.
Water Quality	Effects to circulation and associated changes in water quality.
Vegetative/ Habitat	Migration barriers and stranding potential for aquatic species.
	Instream habitat alterations.

Table 4-23. Summary of key in-water structure regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	In-water structures that are not navigational aids are prohibited in the Coastal Ocean environment, with the exception that temporary and single-anchor structures may be permitted. These structures are a conditional use in the Coastal Ocean High Intensity and Columbia River Estuary environments. In-water structures associated with a fish restoration project are conditional uses in the Freshwater Aquatic environment.
In-water Structures (5.15.B.)	Piling and dolphin installation shall be permitted only in conjunction with a permitted use and shall be the minimum necessary to accomplish the proposed use. (1.)
	In-water structures shall not impede upstream or downstream migration of anadromous fish. All new and replacement structures, including culverts, shall be made fish passable in accordance with the most recent Washington State Department of Fish and Wildlife requirements or with the National Marine Fisheries Service guidelines for Endangered Species Act-listed species. (2.)
	Structures shall be designed and located to minimize removal of riparian vegetation. (3.)
	In-water structures shall be located and designed to preserve or enhance aquatic habitat. (4.)
	Applicants shall demonstrate consideration of flood protection, protection and preservation of ecosystem-wide processes and ecological functions, impacts to fish and wildlife, watershed functions and processes, and hydrogeological, hydraulic, and hydrologic processes. (5.)

4.3.13 Mining

Only one existing gravel mine was noted in the Shoreline Analysis Report, although recreational mining of beach sands also occurs on a limited basis. Mining is not a commonly anticipated land use in shoreline jurisdiction. However, removal of sand from ocean beaches for use in cranberry farming does occur, and is expected to continue.

Table 4-24. Summary of potential impacts from mining.

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

Table 4-25. Summary of key mining regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Mining is a conditional use in the Coastal Conservancy and Columbia River Estuary environments and is prohibited in all other environments, with the exception that mining outside of the channel migration zone is permitted in the Rural Conservancy environment.
Mining (5.16.B.)	An applicant for mining and associated activities within shoreline jurisdiction shall demonstrate that the proposed activities are dependent on a shoreline location, consistent with this Master Program. Nonwater-dependent mining activities are prohibited in shoreline jurisdiction. (1.)
	Mining and associated activities shall be designed and operated to result in no net loss of shoreline ecological functions over the course of mining and reclamation. Determination of no net loss may be based on evaluation of final reclamation required for the site. (2.)
	A surface mining plan or a reclamation plan judged to be insufficient for the protection or restoration of the shoreline environment shall be grounds for denial of a permit. (4.)
	Removal of gravel for flood control purposes is permitted only if a biological and geomorphological study demonstrates a long-term benefit to flood hazard reduction, no net loss of ecological functions, and that extraction is part of a comprehensive flood management solution. (5.)
	Preference shall be given to proposal that result in the creation, restoration, or enhancement of habitat for priority species. (6.)
	Mining waterward of the OHWM shall be prohibited unless removal of specified quantities of materials in specified locations will not adversely impact natural gravel transport, the mining will not significantly impact priority species and ecological functions, and these determinations are integrated with relevant SEPA requirements. (7.)
	Renewal, extension, or reauthorization of in-stream and gravel bar mining activities shall require review for compliance with these new requirements. (8.)
	Temporary removal of riparian vegetation may be permitted subject to the Vegetation Management section of the SMP in cases where direct water access is required as part of a mining or mineral extraction operation. Erosion control measures such as seeding of native species, mulching, ditches, dikes, sedimentation basins and silt fences or curtains shall be provided and maintained. (9.)

4.3.14 Outdoor advertising, signs, and billboards

Impacts from outdoor advertising, signs, and billboards in shoreline jurisdiction are primarily related to aesthetic and view impacts. Accordingly, policies in the SMP focus on preventing sign proliferation beyond existing structures, and regulating sign size and placement to minimize such impacts. Use and installation of signage in all shoreline environment designations shall be subject to the signage provisions in the Pacific County Zoning Ordinance (SMP 5.17.B.1.).

4.3.15 Recreational development

Several shoreline parks are located in Pacific County. Development, replacement, and maintenance of park facilities should be anticipated.

Table 4-26. Summary of potential impacts from recreational development.

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

Table 4-27. Summary of key recreational development regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Water-oriented recreational development is a conditional use in the Natural, Coastal Conservancy, and Willapa Bay Conservancy environments. Nonwater-oriented development is prohibited in the Natural, Willapa Bay Conservancy, Coastal Conservancy, and all aquatic environments, and is a conditional use in all other upland environments.
Recreational Development (5.18.B.)	Recreation facilities shall be designed and located to take maximum advantage of and enhance the natural character of the shoreline area, and ensure no net loss of shoreline ecological functions. (1.)
	Recreational development shall be located, designed, and operated consistent with the purpose of the environment designation in which they are located. Adverse impacts shall be mitigated. (2.)
	Recreation facilities shall be designed to protect public health and water quality by ensuring adequate restrooms, trash cans, pet waste disposal, and similar measures, where applicable. (5.)
	Review of proposed shoreline recreation development shall consider impact of the activities and development on the existing shoreline environment, adjacent shoreline environment, and the necessity and extent of alteration. (6.)
	The adverse effects of storm run-off from parking lots shall be minimized. (7.)

4.3.16 Residential development

Based on development forecasts (Section 3), the demand for new residential development is expected to be low. Relatively limited areas of new development and redevelopment may be anticipated near existing urbanized or developed areas.

As noted in Section 2.1.2, there are 26 existing floating homes on the North River, which will be allowed to remain under the SMP; however, new floating homes will be prohibited. An open water moorage plan will apply to the existing floating homes.

Table 4-28. Summary of potential impacts from residential development.

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

Table 4-29. Summary of key residential development regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Overwater residences are prohibited in all environments except the High Intensity environment, where live-aboards are allowed in marinas. Existing floating homes on the North River are also allowed to be maintained within the Open Water Moorage and Anchorage Area. Multifamily residential development is prohibited in the Natural, Coastal Conservancy, and Willapa Bay Conservancy environments and is a conditional use in all other upland environments. Single-family residential development is a conditional use in the Natural environment and is prohibited in the High Intensity and Coastal Conservancy environments.
Residential Development (5.19.B.)	All new residential development, including plats and subdivisions, shall be designed such that no structural flood hazard reduction or shoreline stabilization measures are necessary for the life of the structure. On steep slopes or bluffs, residential development shall be set back sufficiently to ensure that shoreline stabilization is unlikely to be necessary during the life of the structure, as demonstrated by a geotechnical analysis. On eroding shorelines all development shall adhere to the most restrictive of the prescriptive set back requirements as part of the County's land use ordinances. (2.)
	Residential development is permitted on shorelines where the groundwater table will not be significantly lowered by the construction of drainage facilities and where proposed pumping rates will not cause intrusion of salt water. It shall be the responsibility of the property owner to demonstrate that drainage or pumping facilities will not unduly deplete the ground water resource or cause intrusion of salt water given the cumulative impacts of existing and planned development. (3.)
	Shoreline vegetation shall be retained and protected to the maximum feasible extent during construction, renovation, and repair of residential development, including roads and utilities. Shoreline vegetation, contour, and slope shall be restored to a stable condition within one year after construction is completed,

Location in SMP	Key Provision Providing Protection of Ecological Functions
	that stable condition being as near to the natural condition as possible. (4.)
	Plats and subdivisions shall be designed, configured, and developed in a manner that assures no net loss of ecological functions resulting from the plat or subdivision at full build-out of all lots. (5.)
	Applications for new residential land divisions shall include an evaluation of the clustering of lots to minimize physical and visual impacts on shorelines. (6.)
	New residential development or redevelopment adjacent to areas with existing aquaculture or areas with a high potential for aquaculture shall comply with subsection 5.5.B.5, Protection of water quality near aquaculture areas. (8.)
	New overwater residences are prohibited. (10.)

4.3.17 Restoration

Several planned shoreline restoration activities and projects were identified in the Shoreline Restoration Plan (TWC 2015). Implementation of many of these projects is expected to occur in the foreseeable future.

Table 4-30. Summary of potential impacts from restoration.

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

Table 4-31. Summary of key restoration regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Restoration projects are conditional uses in the Coastal Ocean and Coastal Ocean High Intensity aquatic environments and are permitted in all other environments.
Restoration (5.20.B.)	Long-term maintenance and monitoring shall be included in restoration or enhancement projects. (2.)
	Restoration and enhancement projects shall be designed using scientific and technical information and implemented using best management practices. Applicants should consult applicable guidance documents, such as the most current version of the Washington Department of Fish and Wildlife’s Stream Habitat Restoration Guidelines, state noxious weed listings, and agricultural pest management guidance documents, promulgated by state or federal agencies. (3.)
	Habitat creation, expansion, restoration, and enhancement projects may be permitted when the applicant has demonstrated that spawning, nesting, or breeding fish and wildlife habitat conservation areas will not be adversely affected; water quality will not be degraded; flood storage capacity will not be

Location in SMP	Key Provision Providing Protection of Ecological Functions
	degraded; streamflow will not be reduced; and impacts to critical areas and buffers will be avoided and where unavoidable, minimized and mitigated. (4.)

4.3.18 Shoreline stabilization

Shoreline stabilization is located in many areas throughout the county, particularly along Willapa Bay and the Columbia River. The combination of sea level rise, shifting storm tracks, and increased wave heights is expected to increase coastal flooding and accelerate shoreline erosion in Pacific County. These changes could result in an increased demand for new shoreline stabilization in the county. Generally, the SMP provisions will limit new and expanded shoreline stabilization to areas where existing development requires stabilization measures. Although the SMP limits potential construction of new structures, which would be limited by SMP provisions, repair and replacement of existing structures should be anticipated.

Table 4-32. Summary of potential impacts from shoreline stabilization.

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

Table 4-33. Summary of key shoreline stabilization regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	New hard shoreline stabilization is a conditional use in the Rural Conservancy, Shoreline Residential, and High Intensity environments and is prohibited in all other upland environments.
Shoreline Stabilization (5.21.B.)	New and expanded structural shoreline stabilization measures shall not be allowed except when needed to support a water-dependent use or restoration project or to protect an existing primary structure when there is conclusive evidence that the structure is in danger for erosion from tidal action, currents, or waves. (1.)
	An existing shoreline stabilization structure may be replaced with a similar structure if there is a demonstrated need to protect principal uses or structures caused by currents, tidal action, or waves, and the replacement structures are designed, located, and constructed to assure no net loss of ecological functions and do not encroach waterward of the OHWM. Reconstruction of greater than 50 percent or 50 linear feet, whichever is less, within three years; reconstruction of the footing or bottom course of rock; or placement of a new shoreline stabilization

Location in SMP	Key Provision Providing Protection of Ecological Functions
	structure landward of a falling shoreline stabilization structure, are all considered replacement. (2.)
	Geotechnical reports pursuant to this section that address the need to prevent potential damage to a primary structure shall address the necessity for shoreline stabilization by estimating time frames and rates of erosion and report on the urgency associated with the specific situation. (3.)
	Structural stabilization measure are permitted only when soft stabilization measures have been demonstrated to be insufficient to protect primary structures, the size of the structural shoreline stabilization measure is limited to the minimum size necessary and designed to ensure no net loss of ecological functions, and the stabilization measure is demonstrated to be capable of protecting the integrity of the existing structure over a period of at least 10 years. Clean, durable, erosion-resistant material shall be used. (4.)
	Shoreline stabilization shall not be used to increase land surface area. (5.)

4.3.19 Transportation and parking

Several major highways, including Highway 101 and Highway 105, run parallel to county shorelines. Smaller roads and forest roads also run parallel to and cross shoreline waterbodies. Continued development, replacement, and maintenance of existing transportation facilities should be anticipated.

Table 4-34. Summary of potential impacts from transportation and parking.

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

Table 4-35. Summary of key transportation regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Table 5-1 provides a detailed breakdown of transportation development activities which are permitted, conditionally permitted, or prohibited by shoreline environment designation in order to protect ecological functions. Please refer to SMP draft.
Transportation and Parking: General (5.22.B.1.)	Transportation and parking development shall be carried out in a manner that maintains or improves state water quality standards for affected waters and results in no net loss of shoreline ecological function. (a.)
	Adverse impacts of land transportation facilities on unique or fragile shorelines shall be minimized. (b.)

Location in SMP	Key Provision Providing Protection of Ecological Functions
	Land transportation facilities shall be prohibited in aquatic areas except where bridge crossings are needed and where no feasible alternative shoreland or upland route exists. (d.)
	New port and industrial developments involved in the transfer or transport of petroleum or other hazardous products in the waters and shorelands of Pacific County shall utilize best available technology and procedures to prevent spills and develop and implement contingency plans. Applicants shall also establish procedures for mitigating damages from spills or other malfunctions. (e.)
Transportation and Parking: Roads (5.22.B.2.)	Filling of tidelands to provide for a road right-of-way may be permitted as a conditional use where there are no alternative routes which are economically or topographically feasible. (a.)
Transportation and Parking: Airports (5.22.B.3.)	Airports and associated facilities shall be located so as to minimize adverse impacts to migratory bird flyways and habitat used by resident waterfowl and other birds.
Transportation and Parking: Parking (5.22.B.4.)	Parking lots shall be located/sited outside the shoreline jurisdiction except to support an authorized shoreline use. (a.)
	Parking accessory to an authorized use shall be located landward of the primary use and as far upland from the OHWM as feasible. (b.)
	Parking lots with spaces for 10 or more cars shall not be located within 100 feet of the OHWM. (c.)

4.3.20 Utilities

Maintenance of existing utility facilities should be anticipated. In addition, in order to address new demand in the City of Raymond and to improve service reliability throughout the county, the Pacific County Public Utility District has plans for new major transmission lines. Some of these improvements may be located in shoreline jurisdiction.

Table 4-36. Summary of potential impacts from utilities.

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

Table 4-37. Summary of key utilities regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment	Table 5-1 provides a detailed breakdown of utilities development activities which

Location in SMP	Key Provision Providing Protection of Ecological Functions
Designations – Shoreline Use Table (Table 5-1)	are permitted, conditionally permitted, or prohibited by shoreline environment designation in order to protect ecological functions. Please refer to SMP draft.
Utilities (5.23.B.)	Utility production and processing facilities, such as power plants and sewage treatment plants, or parts of those facilities, are prohibited in shoreline jurisdiction unless it can be demonstrated that no other feasible option is available. (2.)
	Electrical and communication transmission and distribution lines shall be located outside of shoreline jurisdiction where feasible. (3.)
	When allowed, utilities shall be located in existing rights-of-way and corridors whenever possible; be located, designed, constructed, operated, and maintained to result in no net loss of shoreline ecological functions; and limit any clearing to the minimum necessary to prevent interference with vegetation. (4.)
	Upon completion of installation of such utility systems or of any maintenance project which disrupts the environment, the disturbed area shall be regraded and replanted to be compatible with the natural terrain and prevent erosion. (5.)
	Existing utilities shall not be construed as justification for more intense development. (6.)
	New oil and gas-related facilities shall be permitted only when the applicant can demonstrate adequate plans, equipment, staffing, procedures, financial and performance capabilities to ensure that adequate prevention, response, and mitigation can be provided throughout the life of the facility. (7.)
	Any oil and gas facilities, including pipelines shall be located, designed, constructed, and maintained to ensure adequate protection from geological hazards, such as liquefaction, hazardous slopes, erosional shorelines, earthquakes, tsunamis, areas subject to storm surge or subsidence, areas projected to be inundated by sea level rise, physical oceanographic processes, and natural disasters. (9.)
	All pipeline corridors and energy distribution lines shall be located in existing utility rights-of-way and integrated with existing pipeline or electric transmission corridors to the maximum extent feasible unless there are overriding technical constraints or significant social, aesthetic, environmental, or economic concerns. (10.)
Development of pipelines and cables on tidelands, particularly those running roughly parallel to the shoreline, and development of facilities that may require periodic maintenance which disrupt shoreline ecological functions, shall be discouraged except where no other feasible alternative exists. (11.)	

4.4 Coastal Ocean Use and Modification Provisions

The county’s shoreline jurisdiction extends out to three miles from the OHWM. Beyond three miles, jurisdiction falls to the federal government. However, Section 307 of the Coastal Zone Management Act (CZMA) requires that federal actions that have reasonably foreseeable effects on any coastal use or resource be consistent with the enforceable policies of a state’s federally approved coastal management program. In Pacific County, where marine fisheries are an integral part of the regional economy, marine fishery resources and activities regularly extend

beyond the three-mile limit of state jurisdiction. Once adopted and approved by Ecology, the policies and regulations of the Pacific County SMP will become a part of the state's coastal management program, and the enforceable policies and regulations in the SMP can be a tool to help ensure that federal actions are consistent with the county's marine management objectives.

4.4.1 General ocean uses

Section 6.1 of the proposed SMP includes policies and regulations that apply to all coastal ocean uses. Applications for coastal ocean uses must demonstrate significant local, state, or national need, and must take all reasonable steps to avoid and minimize environmental impacts in accordance with the SMP's mitigation sequencing provisions. Pre-project environmental baseline assessments are required of all proposals in order to determine effects on marine and estuarine ecosystems, and rehabilitation plans and bonds are required to address potential adverse impacts. All non-water-oriented facilities associated with approved coastal ocean uses must be located landward of the water-oriented use or outside shoreline jurisdiction unless no other location is feasible. Additionally, coastal ocean uses are defined as permitted, conditionally permitted, or prohibited in each shoreline environment designation (SMP Table 5-1). Ocean uses may comprise a variety of activities; however, ongoing activities, such as fishing and navigation, are not directly regulated.

4.4.2 Ocean disposal

The total amount of maintenance dredging in the Columbia River is approximately 3 to 5 million cubic yards per year. The Corps maintains numerous dispersive flow-lane and open-ocean dredge disposal sites in and around the Lower Columbia River. Much of the dredge material from the mouth of the Columbia River is used for shallow water open ocean disposal, whose transport pathway takes it to nearby beaches and the backside of the jetties to mitigate recent nearby shoreline erosion and subsequent jetty instability. Disposal of dredged material from the Columbia River is considered a significant opportunity to augment the depressed sediment supply from the Columbia River to the CRLC. In particular, sediment disposal is considered an action that could help limit erosion of shorelines north of the Columbia River and along the Long Beach Peninsula. Given the ongoing dredging activity within the Columbia River for navigation, continued disposal of dredged material within the nearshore Coastal Ocean environment is anticipated.

Table 4-38. Summary of potential impacts from ocean disposal.

Functions	Potential Impacts to Functions
Hydrologic	Alteration of erosion and accretion processes.
	Alteration of currents and waves.
	Alteration of substrates.
Water Quality	Turbidity caused by disturbance of sediment.
	Suspension of toxic materials and contaminants.
Vegetative/ Habitat	Disturbance of vegetation and habitat from sediment disposal and associated turbidity.

Table 4-39. Summary of key ocean disposal regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Ocean disposal by belly dump is prohibited in the Coastal Ocean environment and is a conditional use in the Coastal Ocean High Intensity environment. All other types of ocean disposal are conditional uses in the Coastal Ocean and Coastal Ocean High Intensity environments, and prohibited in the Willapa Bay Estuary environment (unless for ecological restoration).
Ocean Disposal (6.3.B.)	Ocean disposal shall be permitted only at sites approved by Washington Department of Ecology, Washington Department of Natural Resources, the U.S. Environmental Protection Agency and U.S. Army Corps of Engineers. (1.)
	Ocean disposal sites shall be located and designed to prevent, avoid, and minimize adverse impacts on environmentally critical and sensitive habitats, coastal resources and uses, including fishing. (3.)
	Disposal of dredged material is permitted when it is specifically located and designed to restore habitat, maintain shoreline functions, and sediment transport processes by directing sediment toward the Long Beach Peninsula to the maximum extent possible. The applicant shall demonstrate that the most current, accurate, and complete scientific and technical information supports the proposed disposal locations and application to maintain beach functions. (5.)

4.4.3 Ocean transportation

The Columbia River supports navigation associated with the major shipping ports of Vancouver, WA and Portland, OR and the fishing ports of Ilwaco, WA and Astoria, OR. Vessels may also pass by Pacific County heading to and from Grays Harbor, the north coast of Washington, and across the Pacific.

The number of container vessels shipping goods along the west coast of North America has increased and is projected to continue to increase over time (Douglas et al. 2008). An increase in vessel traffic could lead to increased instances of vessel collisions as well as ship strikes to marine mammals (Etkin et al. 2014; Douglas et al. 2008).

Table 4-40. Summary of potential impacts from ocean transportation.

Functions	Potential Impacts to Functions
Hydrologic	Fixed moorage structures can alter sediment transport processes.
	Development of new channels alters substrate and erosion and accretion processes.
Water Quality	Risk of water quality impacts from spills or leaks.
Vegetative/ Habitat	Oil spills can result in toxicity-related mortality to existing fish and shellfish stocks (adults, juveniles, and eggs) and decreased fish and shellfish fecundity.
	Introduction of non-native, invasive species through cargo and ballast water.

Table 4-41. Summary of key ocean transportation regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Transporting of petroleum products and other hazardous materials is a conditional use in all aquatic environments.
	Ocean uses involving the transport of petroleum products will require a conditional use permit review and shall be reviewed by the Hearings Examiner. (1.)
Ocean Transportation (6.4.B.)	The transport of oil or gas or other mineral via pipeline, including to and from vessels, ports or on-shore facilities will require a conditional use permit. (2.)
	New port and industrial developments involved in the transfer of petroleum or other hazardous products in the waters and shorelands of Pacific County shall utilize best available technology and procedures to prevent spills and develop and implement contingency plans, including use of escort tugs. Applicants shall also establish procedures for mitigating damages from spills or other malfunctions. (3.)
	Transportation uses shall be located or routed to avoid impacts to habitat areas of endangered or threatened species, environmentally critical and sensitive habitats, migration routes of marine species and birds, marine sanctuaries, and environmental or scientific preserves to the maximum extent feasible. (4.)
	Applicants for new ocean transportation uses shall submit an assessment of the anticipated impacts of the proposed use on renewable resource activities such as fishing and on environmentally critical and sensitive habitat areas, environmental and scientific preserves, and sanctuaries. (5.)

4.4.4 Oil and gas uses

Given the frequent cargo traffic and the challenging navigational conditions in the Pacific Coast and at the mouth of the Columbia River, oil spills are a potential environmental hazard in the region. The risk of oil spills is increased by the transport of crude oil from Canada and the interior United States. Crude oil is heavier, and therefore presents greater challenges for containment and greater risk to wildlife compared to lighter oils such as gasoline (Washington Department of Ecology 2015). Crude oil is transported by rail along the Columbia River Gorge

and out of the Columbia River mouth on articulated tug barges (ATBs). Almost 70 percent of crude oil is currently transported by vessels (Etkin et al. 2014). Oil and gas uses are prohibited in all shoreline environments under the proposed SMP (SMP Table 5-1).

Table 4-42. Summary of potential impacts from oil and gas uses.

Functions	Potential Impacts to Functions
Hydrologic	Fixed structures used for development and production of oil and gas uses can alter currents and sediment transport processes.
Water Quality	Risk of water quality impacts from spills or leaks.
Vegetative/ Habitat	Oil spills can result in toxicity-related mortality to existing fish and shellfish stocks (adults, juveniles, and eggs) and decreased fish and shellfish fecundity.

4.4.5 Ocean mining

Ocean mining uses are not commonly anticipated in Pacific County. Limited recreational gold mining and sand removal for cranberry bogs occurs along ocean beaches. These uses are expected to continue.

Table 4-43. Summary of potential impacts from ocean mining.

Functions	Potential Impacts to Functions
Hydrologic	Alteration of erosion and accretion processes.
	Alteration of currents and waves.
	Alteration of substrates.
Water Quality	Turbidity caused by disturbance of sediment.
	Suspension of toxic materials and contaminants.
Vegetative/ Habitat	Disturbance of vegetation and habitat from sediment removal and associated turbidity.

Table 4-44. Summary of key ocean mining regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Ocean mining is a conditional use in the Coastal Ocean and Coastal Ocean High Intensity environments and is prohibited in the Willapa Bay Estuary environment.
Ocean Mining (6.6.B.)	Ocean mining is prohibited in areas that would adversely impact biological communities, habitats, fishery resources and other renewable resources, or that would be detrimental to the natural beach processes such as erosion and littoral beach transport. Special attention shall be given to habitat recovery rates in the review of permits for seafloor mining and shall prohibit continued mining that does not substantially return to pre-mining conditions. (1.)

4.4.6 Ocean energy production

Potential ocean energy projects include projects generating power from waves, tidal currents, and wind. Both wave and tidal energy production potential is high in Pacific County, but feasibility may be limited. The potential for offshore wind energy also exists and may develop further as technologies improve, economic factors are improved, and regulatory roles are clarified (Musial and Ram 2010). In addition to potential ecological impacts, ocean energy projects could interfere with fishing, navigation, and other uses. The SMP would minimize the potential for these use conflicts. While there are currently no pending tidal energy projects for Pacific County, the county’s Public Utility District has been working on a pilot tidal energy project in the main channel near Wash-Away Beach.

Table 4-45. Summary of potential impacts from ocean energy production.

Functions	Potential Impacts to Functions
Hydrologic	Alteration of currents and waves.
	Alteration of substrates, sediment transport and deposition.
Water Quality	Toxicity of paints, lubricants, and antifouling coatings.
	Potential for spills.
Vegetative/ Habitat	Alteration of habitats for benthic organisms.
	Acoustic effects of noise during construction and operation.
	Emission of electromagnetic fields.
	Interference with animal movements and migrations
	Direct injury and mortality to fish and wildlife, and potential unforeseen population and community impacts.

Table 4-46. Summary of key ocean energy regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Fixed structures associated with ocean energy production are prohibited in the Coastal Ocean and Willapa Bay Estuary environments, with the exception that temporary and single-anchor structures are permitted. All other ocean energy production uses are conditional uses in all aquatic environments.
Ocean Energy Production (6.7.B.)	Energy-producing uses shall be located, constructed, and operated in a manner that has no detrimental effects on beach accretion or erosion and wave processes. (1.)
	Ocean energy production facilities shall not be permitted unless the applicant demonstrates conclusively that adverse impacts to oceanographic processes and ecosystem processes can be fully mitigated, that potential conflicts with existing uses in the area are avoided, minimized, and mitigated, the public benefits clearly outweigh the risks to the shoreline environment, and the applicant demonstrates the financial and performance capabilities to carry out the project as designed. (3.)
	System components of ocean energy facilities that are not water-dependent shall be located outside shoreline jurisdiction unless alternative locations, including

Location in SMP	Key Provision Providing Protection of Ecological Functions
	alternative technology, are demonstrated to be infeasible. Location of the system components shall not result in a net loss of shoreline ecological functions and processes. (4.)
	Where a shoreline location is necessary for associated energy distribution facilities and lines, they shall be located in existing utility rights-of-way and corridors whenever feasible. (5.)

4.4.7 Ocean research

Ocean research activities involve scientific investigation of the ocean environment. Research activities could include a wide variety of potential modifications to the ocean environment, depending on the specific investigation. If modification associated with ocean research include activities otherwise regulated under the SMP, those SMP standards would also apply.

Table 4-47. Summary of potential impacts from ocean research.

Functions	Potential Impacts to Functions
Hydrologic	Fixed structures can modify sediment transport processes.
Water Quality	Risk of water quality impacts from spills or leaks.
Vegetative/ Habitat	If species are relocated, the potential exists for introduction of non-native, invasive species.

Table 4-48. Summary of key ocean research regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Ocean research is permitted in all three aquatic environments.
Ocean Research (6.8.B.)	<p>Ocean research shall be located and operated in a manner that minimizes intrusion into or disturbance of coastal ocean areas consistent with the purposes of the research and the intent of the general ocean use guidelines in subsection 6.1 of the SMP. (2.)</p> <p>Ocean research shall be completed or discontinued in a manner that restores the environment to its original condition to the maximum extent feasible, consistent with the purposes of the research. (3.)</p>

4.4.8 Ocean salvage

Ocean salvage activities involve relatively small sites occurring intermittently. An example of ocean salvage activities is the salvage of historic shipwrecks, which includes aspects of recreation, exploration, research, and mining.

Table 4-49. Summary of potential impacts from ocean salvage.

Functions	Potential Impacts to Functions
Hydrologic	Disturbance of substrate.
	If anchoring or fixed moorage is required, then sediment transport processes may be altered.
Water Quality	Suspension of toxic materials.
Vegetative/ Habitat	Turbidity may affect habitat functions.

Table 4-50. Summary of key ocean salvage regulations that protect ecological functions.

Location in SMP	Key Provision Providing Protection of Ecological Functions
Environment Designations – Shoreline Use Table (Table 5-1)	Ocean salvage is a permitted in all three aquatic environments.
Ocean Salvage (6.9.B.)	Non-emergency marine salvage and historic shipwreck salvage activities shall be conducted in a manner that minimizes adverse impacts to the ocean environment and renewable resource uses. (1.)
	Damages from emergency salvage shall be avoided, minimized, and mitigated through communication and cooperation with existing uses in the area of emergency salvage operations. (3.)

4.5 Shoreline Restoration Plan

One of the key objectives that the SMP must address is “no net loss of ecological functions necessary to sustain shoreline natural resources” (Ecology 2011). Although the implementation of restoration actions to restore historic functions is not required by SMP provisions, the SMP Guidelines state that “master programs shall include goals, policies and actions for restoration of impaired shoreline ecological functions. These master program provisions should be designed to achieve overall improvements in shoreline ecological functions over time, when compared to the status upon adoption of the master program” (WAC 173-26-201(2)(f)).

The Shoreline Restoration Plan (TWC 2015) represents a long-term vision for restoration that will be implemented over time, resulting in a gradual improvement over the existing conditions. Although the SMP is intended to achieve no net loss of ecological functions through regulatory standards alone, practically, an incremental loss of shoreline functions at a cumulative level may occur through minor, exempt development; illegal development; failed mitigation efforts; or a temporal lag between the loss of existing functions and the realization of mitigated functions. The Shoreline Restoration Plan, and the voluntary actions described therein, can be an important component in making up that difference in ecological function.

Major Shoreline Restoration Plan components that are expected to contribute to improvement in ecological functions in the foreseeable future are summarized below:

- Site-specific projects to restore ecological processes. General objectives and strategies of such projects include:
 - Improving fish passage through upgrading or decommissioning of roads and culvert removal;
 - Replanting of riparian corridors and removal of invasive vegetation;
 - Improving habitat complexity through placement of large woody debris and restoration of wetlands and off-channel habitat;
 - Improving water quality through implementation of TMDL recommendations, cleanup of contaminated sediments, reduction of impervious surfaces, and reduction of sediment loading; and
 - Working with landowners to control livestock access.
- Where existing systems are largely intact, focusing on protecting those intact processes and functions;
- Identification of restoration partners and funding sources to facilitate implementation of projects;
- Tracking restoration and protection projects through Habitat Work Schedule and the Washington State Conservation Commission's Conservation Practice Data System; and
- Outreach and education measures that help inform and engage the public to make voluntary actions that limit degradation and/or improve shoreline functions on the approximately 72 percent of County shorelines that are privately owned.

Notably, the Washington State 2015-2017 biennium budget includes over \$8 million (just over half of the total funding request) to fund projects identified in the Washington Coast Restoration Initiative (WCRI). Several projects included in the funding request occur in Pacific County, and many of them will now be implemented in the near term. These projects include the following:

- Lower Forks Creek Restoration. This project is designed to restore ~28 miles of habitat. The restoration will remove several in-stream concrete structures that are below the hatchery facility and add LWD from the intake down to the hatchery, which will increase channel diversity, channel stability and the ability to capture gravels. The new riparian plantings along the lower reach will lower stream temperatures by providing shade and will provide bank stabilization.
- Stringer Creek Barrier Removal and Replacement. This project will remove and replace a complete fish passage barrier, add 1,100 ft of new meandering channel downstream, add a minimum of 50 pieces LWD downstream, replant/restore riparian vegetation, and restore floodplain connectivity. The fish passage barrier correction will open 6.6 miles of habitat for anadromous salmon. This is the number one freshwater fish barrier culvert in Pacific County.
- Wash-Away Beach Restoration. The project will mitigate the environmental impact resulting from the rapid erosion of North Beach by removing debris and structures before the erosion takes them. This project will remove approximately 10 houses and associated structures per year. Materials and any hazardous waste will be disposed of in the appropriate locations.

- Rue Creek Salmon Restoration. This project will replace two undersized culverts, which are barriers to fish passage and limit the transport of sediment and large woody debris. The project will improve the functions of ~6.5 miles of habitat.
- Greenhead Slough Barrier Removal. This project will replace the existing blocking culvert with a steel bridge. This project will build upon previous project design activities for the bridge and will be the final element in restoring this 2,317-acre watershed and over 18 miles of salmon habitat.
- Ellsworth Creek Watershed Restoration. This project is designed to restore the health and function of the entire 5,000-acre Ellsworth Creek watershed, with benefits to salmonids and forest and riparian health. WCRI funding for this project would remove an additional 4 miles of forest road and upgrade another 6 miles. The project will also leverage existing SRFB funding to permanently remove a bridge over Ellsworth Creek and concurrently complete large woody material placement within one mile of Ellsworth Creek.

The implementation of these projects and others identified in the Shoreline Restoration Plan will help improve hydrologic, habitat, vegetation, and water quality functions.

5 EFFECTS OF OTHER REGULATORY PROGRAMS

This chapter describes the beneficial effects that other regulatory programs may have on the County's shorelines.

5.1 County Regulations and Programs

The Pacific County Comprehensive Plan, last updated in 2010, is a statement of goals and policies that guides growth and development throughout the county. In addition to the basic elements required by the Growth Management Act (GMA), such as environment, land use and rural lands, critical areas and resource lands, housing, transportation, capital facilities, and utilities, the county's Comprehensive Plan establishes an overall land use pattern. It provides the general distribution, location, and extent of the commercial, industrial, residential, and natural resource land uses.

The Comprehensive Plan is implemented through development regulations. All development activity within the county is required to comply with the Pacific County Code (PCC). Provisions in the PCC that potentially affect how future development is implemented and the extent of potential ecological impacts include critical area and zoning regulations.

5.1.1 Critical Area Regulations

County regulations applicable to critical areas are detailed in Pacific County Ordinance 147. These regulations were last updated in 1999. Some portions of these regulations do not reflect the most current, accurate, and complete scientific and technical information available and are not consistent with current guidance from Ecology. The county is currently in the process of updating its critical areas regulations. The updated regulations will apply to wetlands, fish and wildlife habitat conservation areas (including streams), geologically hazardous areas, critical aquifer recharge areas, and frequently flooded areas outside of shoreline jurisdiction. Critical areas within shoreline jurisdiction will be regulated by the SMP critical areas provisions discussed above in Section 4.2.1.

5.1.2 Zoning Code

Title 18 of the Pacific County Code provides zoning standards that more specifically direct uses, building bulk, scale, and location, and other design considerations. The zones generally correspond with the Comprehensive Plan designations, and minimum lot sizes are dictated through the Comprehensive Plan land use designations.

5.2 Tribal Regulations and Programs

The Shoalwater Reservation is approximately one square mile in size. As a sovereign nation, the Shoalwater Tribe has its own zoning and environmental provisions that apply within the reservation.

The Shoalwater Bay Indian Tribe Non-Point Source Pollution Assessment Report and Management Plan (2015) identifies potential environmental concerns within the Shoalwater Bay Indian Reservation and surrounding lands and waters. The report summarizes results from sanitary sewer surveys and groundwater and surface water quality surveys and proposes management recommendations for sewer system improvements, ongoing monitoring needs, noxious weed control, road maintenance, and collaboration with other agencies and private entities.

5.3 State Agencies/Regulations

5.3.1 Washington Department of Natural Resources (WDNR)

WDNR is charged with protecting and managing use of State-owned aquatic lands for revenue, outdoor recreation, and habitat for native fish and wildlife. Water-dependent uses waterward of the OHWM require review by WDNR to establish whether the project is on State-owned aquatic lands. Certain project activities, such as single-family or two-party joint-use residential piers, are exempt from these requirements. WDNR also implements and enforces the Forest Practices Act and Surface Mining Act (see sections 5.3.6 and 5.3.7 below).

5.3.2 Washington Department of Ecology

The Washington Department of Ecology (Ecology) may review and condition a variety of project types, including any project that needs a permit from the U.S. Army Corps of Engineers (Corps), any project that requires a shoreline conditional use permit or shoreline variance, and any project that disturbs more than one acre of land. Project types that may trigger Ecology involvement include pier and shoreline modification proposals and wetland or stream modification proposals, among others.

5.3.3 Washington Department of Fish and Wildlife

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

5.3.4 Ocean Resources Management Act

The Ocean Resources Management Act establishes policies that are intended to protect the functions and values of the State’s ocean resources. The Act establishes criteria for federally, state, or locally permitted uses or activities that will adversely impact renewable resources, marine life, fishing, aquaculture, recreation, navigation, air or water quality, or other existing ocean or coastal uses. The provisions for coastal ocean uses and modifications in the Draft SMP are consistent with the policies of the Ocean Resources Management Act.

5.3.5 Washington State Parks and Recreation Commission – Seashore Conservation Area

The Seashore Conservation Area (SCA), established in 1967, includes lands between the line of mean high tide and the line of mean low tide from Toke Point in Pacific County to the south jetty in Grays Harbor County, and from Damon Point in Grays Harbor County to the Makah Indian Reservation. The SCA establishes standards for ocean beach management, including provisions that regulate vehicular traffic and mining for sand within the SCA. In addition, the Seashore Conservation Line (SCL) survey, performed every 10 years, determines the rates of erosion and accretion, and defines ownership of lands adjacent to Parks properties.

5.3.6 State Forest Practices Act

Activities related to growing, harvesting, or processing timber are regulated under Washington’s State Forest Practices Act (WAC 222) administered by WDNR. Forest practices regulated under the SMP are limited to conversions and other Class IV-General forest practices that will likely result in a conversion to non-forest uses, as well as selective timber cutting along shorelines of statewide significance (SMP Section 5.12.B)).

5.3.7 Surface Mining Act

The Surface Mining Act is a reclamation law administered by WDNR that requires a permit for each mine that 1) results in more than three acres of min-related disturbance, or 2) has a high-wall that is both higher than 30 feet and steeper than 45 degrees. WDNR is responsible for reviewing and approving site reclamation plans to achieve the general goals of site restoration.

5.4 Federal Agencies/Regulations

5.4.1 Clean Water Act

Major components of the Clean Water Act include Section 404, Section 401, the National Pollutant Discharge Elimination System (NPDES), and Section 303(d).

Section 404 provides the Corps, under the oversight of the U.S. Environmental Protection Agency (EPA), with authority to regulate “discharge of dredged or fill material into waters of the United States, including wetlands.” As applicable to the county’s shoreline jurisdiction, this generally means that the Corps must review and approve most activities in streams and wetlands. These activities may include wetland fills, stream and wetland restoration, culvert installation or replacement, or others. The Corps requires projects to avoid, minimize, and compensate for impacts.

A Section 401 Water Quality Certification is required for any applicant for a federal permit for any activity that may result in any discharge to waters of the United States. States and tribes may deny, certify, or condition permits or licenses based on the proposed project’s compliance with water quality standards. In Washington, Ecology has been delegated the responsibility by the EPA for managing implementation of this program.

The NPDES is similar to Section 401, and 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, or discharge related to industrial activities.

Section 303(d) of the Clean Water Act requires the state to develop a list of waters that do not meet water quality standards. A Total Maximum Daily Load, or TMDL, must be developed for impaired waters. Ecology is working with the county and other partners to implement water quality improvement projects as part of TMDLs. In Pacific County, TMDLs have been established for the Willapa River Subbasin and the Columbia River Estuary.

5.4.2 Rivers and Harbors Act, Section 10

Section 10 of the federal Rivers and Harbors Appropriation Act of 1899 provides the Corps with authority to regulate activities that may affect navigation of “navigable” waters. Designated “navigable” waters in Pacific County include:

- The Pacific Ocean
- The Columbia River
- Willapa Bay (including Skidmore Slough)
- The lower 4 miles of the Bear River
- The lower 15.3 miles of the Naselle River
- The lower 5 miles of the North River
- Tidal waters of the Bear, Willapa, Nemah, and Palix Rivers

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.

5.4.3 Federal Endangered Species Act (ESA)

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 attempt to engage in any such conduct.” Per Section 7 of the ESA, the Corps must consult with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service on any projects that fall within Corps jurisdiction (e.g. Section 404 or Section 10 permits, as described above) that could affect species listed under the ESA. These agencies ensure that the project includes impact minimization and compensation measures for protection of listed species and their habitats.

5.4.4 Coastal Zone Management Act (CZMA)

Section 307 of the CZMA, the “federal consistency” provision, requires that federal actions that have reasonably foreseeable effects on any coastal use or resource be consistent with the enforceable policies of a state’s federally approved coastal management program. Federal agency activities must be consistent to the maximum extent practicable with the enforceable policies of a state coastal management program. To the extent that the county’s SMP establishes enforceable policies for uses and modifications in the marine environment, the SMP can be a tool to help ensure that federal actions are consistent with the county’s marine management objectives.

5.4.5 Dredged Material Management Program

Dredging projects typically involve multiple agencies at the local, state, and federal levels. Before applying for a permit, an applicant must obtain a Suitability Determination or other decision document from the interagency Dredged Material Management Program that evaluates the proposed project. Applicants for new dredging projects must also obtain permits from the Corps, Ecology, WDFW, and the local government with jurisdiction. As part of the Corps process, ESA consultation with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service will be conducted. If in-water disposal is proposed, a Site Use Authorization from WDNR is also required.

6 NET EFFECT ON ECOLOGICAL FUNCTIONS

This analysis indicates that the overall rate of anticipated development in Pacific County is expected to remain relatively low in the foreseeable future. Development is likely to be concentrated near existing developed areas and at port facilities. Agricultural, aquacultural, fishing, and forestry uses are expected to continue to predominate. Maintenance and repair of existing shoreline and aquatic facilities is also anticipated.

Irrespective of new land use changes, the county faces several challenges in maintaining shoreline functions. These include controlling non-native and invasive species; adapting to changes associated with sea level rise, ocean acidification, and climate change; and managing coastal shorelines in the face of a diminished sediment supply from the CRLC. The proposed Pacific County SMP provisions were developed to address these risks to the extent possible and to compliment planned programs and restoration projects. The SMP is expected to maintain existing shoreline functions within Pacific County while accommodating reasonably foreseeable future shoreline development. Other local, state, and federal regulations, acting in concert with the SMP, will provide further mechanisms and assurances of maintaining shoreline ecological functions over time. The Shoreline Restoration Plan, and the voluntary actions described therein, will ensure that incremental losses that could occur despite SMP provisions do not result in a net loss of functions.

As discussed in previous sections, major elements of the SMP that help ensure no net loss of ecological functions fall into four general categories: 1) environment designations; 2) general policies and regulations; 3) critical areas regulations; and 4) shoreline and ocean use and modifications regulations. The Shoreline Restoration Plan identifies ongoing and planned voluntary restoration that will provide an opportunity to improve shoreline conditions over time.

Environment designations: Shoreline environment designations were assigned to shorelines to minimize use conflicts and designate appropriate areas for specific uses and modifications (SMP Section 3).

General provisions: SMP Section 4 contains general policies and regulations designed to maintain shoreline ecological functions. These regulations apply to all shoreline uses and modifications, and they provide the basis for achieving no net loss of shoreline ecological functions, such as mitigation sequencing, critical areas and flood hazard regulations, and vegetation conservation standards.

The proposed SMP incorporates by reference the county's Critical Areas and Resource Lands (CARL) Ordinance, codified as Pacific County Code Title 16, Division III. The Ordinance is currently being updated to align with best available science. Following adoption of the updated CARL, the SMP will adopt this version by reference. All shorelines are designated as fish and wildlife habitat conservation areas, with shoreline buffers designated by environment

designation under the SMP (SMP Section 5.2 Table 5-2, Dimensional Standards). Proposed buffers are generally consistent with average existing conditions on developed parcels in each environment. The county's critical area regulations ensure that vegetated buffers are retained on wetlands, fish and wildlife habitat conservation areas (including all shorelines), and geologically hazardous areas. The county's flood hazard regulations require that vegetation, flood capacity, and water quality are maintained, and that where feasible, buildings are located outside of the floodway. Combined, these regulations help ensure that the most sensitive areas of the county's shorelines are protected.

Shoreline use, shoreline modification, and ocean use provisions: SMP Sections 5 and 6 contain a number of policies and regulations that contribute to the maintenance of ecological functions. Shoreline and ocean uses and modifications were individually determined to be permitted, conditionally permitted, or prohibited in each environment designation (SMP Section 5 Table 5-1). More uses and modifications are permitted in those areas with higher levels of existing disturbance, and allowed uses and modifications are more limited in areas with lower levels of disturbance. Regulations prohibit uses that are incompatible with the existing land use and ecological conditions, and emphasize appropriate location and design of various uses.

Shoreline Restoration Plan: The Shoreline Restoration Plan identifies a number of project-specific opportunities for restoration on both public and private properties inside and outside of shoreline jurisdiction, and also identifies ongoing county programs and activities, restoration partners, and recommended strategies and actions consistent with a variety of watershed-level planning efforts.

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

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