

**COWLITZ COUNTY
GRANT No. G1200052**

CUMULATIVE IMPACTS ANALYSIS

Cowlitz County's Shoreline Master Program



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Cowlitz –Wahkiakum Council of Governments
207 4th Avenue North
Kelso, WA 98626

Prepared by:



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**The Watershed Company
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CUMULATIVE IMPACTS ANALYSIS

COWLITZ COUNTY SHORELINE MASTER PROGRAM

1 INTRODUCTION

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

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

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

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

In short, updated SMPs shall contain goals, policies and regulations that prevent degradation of ecological functions relative to the existing conditions as documented in

that jurisdiction’s inventory and characterization report. For those projects that result in degradation of ecological functions, the required mitigation must return the resultant ecological function back to the baseline. This is illustrated in the figure below. The jurisdiction must be able to demonstrate that it has accomplished that goal through an analysis of cumulative impacts that might occur through implementation of the updated SMP. Evaluation of such cumulative impacts should consider:

- (i) current circumstances affecting the shorelines and relevant natural processes [Chapter 3 below and the Shoreline Analysis Report];
- (ii) reasonably foreseeable future development and use of the shoreline [Chapter 4 below and the Shoreline Analysis Report]; and
- (iii) beneficial effects of any established regulatory programs under other local, state, and federal laws.” [Chapter 6 below]

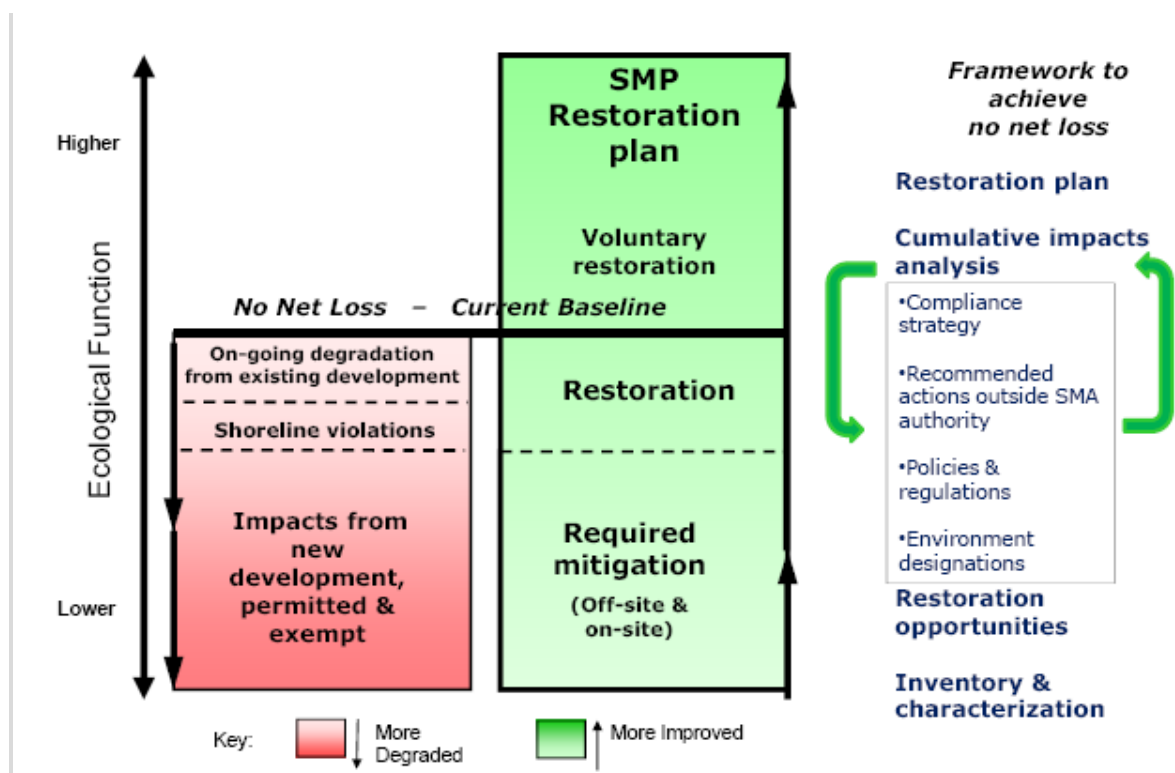


Figure 1-1. Framework to achieve no net loss of ecological function. (Department of Ecology)

The Cumulative Impacts Analysis assesses the policies and regulations in the 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. A complete reassessment of conditions, policies and regulations will be considered every eight years, during the scheduled SMP update (concurrent with the Comprehensive Plan update). To conduct a valid reassessment of the shoreline conditions, the County will need to identify metrics and then monitor, record and maintain key environmental metrics to allow a comparison with baseline conditions. As monitoring occurs, the County should assess environmental effects of development and restoration objectives. With this level of attention to conditions, permitted development, and adaptive management as needed in the long term, the County should be able to ensure that the regulations and mitigation sequencing required by the SMP will maintain shoreline functions over time.

1.1 Document Overview

The ultimate goal of this document is to determine whether future development in the 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. This section provides an overview of how this document is organized in order to achieve this goal.

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

To understand what future development activities in the County's shorelines might occur that could alter existing conditions, Chapter 4 presents the brief results of an assessment of likely future development. This assessment is based on existing land use conditions, recent trends in land use changes, and permit history. 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.

Chapter 5 is a key section of this cumulative impacts analysis. It describes how foreseeable development could affect shoreline conditions, and what specific provisions of the proposed SMP will help maintain existing conditions in spite of likely future development. Chapter 5 begins, in Section 5.1, 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 5.2 presents key general standards and regulations in the SMP intended to protect the ecological functions of the shoreline. Section 5.3, perhaps the most important section of this document, includes the following for each specific use or modification listed in the SMP:

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

Chapter 5 concludes, in Section 5.4, with a discussion of the potential beneficial effects of the Shoreline Restoration Plan.

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

Using the information presented in previous chapters, Chapter 7 zeroes in on the most probable types of development in the County, and synthesizes the information from Chapters 3 through 6 to assess anticipated cumulative impacts.

Finally, Chapter 8 pulls together all the elements of the SMP and previously discussed background information and analysis to summarize whether and how the SMP ensures no net loss of ecological functions in a way they can be easily digested by the reader.

2 METHODOLOGY

This Cumulative Impacts Analysis was prepared consistent with direction provided in the Shoreline Master Program Guidelines as described above. Existing conditions were first evaluated using the information, both textual and graphic, developed and presented in the Shoreline Analysis Report. 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, including those that lie within Urban Growth Areas (UGAs). The County recognizes UGAs in the Cities of Woodland and Castle Rock. Because UGAs are generally planned for future annexation into their associated Cities, unincorporated Urban Growth Areas were assigned shoreline environment designations for the County, consistent to the maximum extent practicable with those for each associated City. It is anticipated that the majority of development will occur once the area is annexed, and until that time, all unincorporated UGAs will be regulated under the County's SMP.

2.1 Future Development

2.1.1 Analysis of Land Use Trends

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

Comparative analysis results are presented as the change in acreage and the change in percent of total acreage from 2002 to 2012. The total area of developable vacant lands was calculated as parcels not characterized as resource lands (open space, agriculture, forestland, fishing activities, or other land use not associated with likely future development), nor publicly held and with an assessed improvement value of less than \$10,000 were identified as developable vacant. Lands in PacifiCorp ownership were also excluded from the developable vacant lands assessment.

2.1.2 Permit History Data Analysis Methodology

A review of shoreline development permits previously issued by Cowlitz County was undertaken in order to better understand the type and extent of recent development actions occurring in the County, and to help anticipate future trends in

shoreline land use changes and shoreline modifications. The development permits reviewed were limited to those issued between 2001 and 2011.

The permit history data provided by Cowlitz County for this purpose came in two basic database formats. One database format had permits dating to the late 1970s and was organized by permit type and waterbody. The other database format had permits from 2001 to 2011 and was organized by application year. The two databases had some overlap, but they were not mutually inclusive. Therefore, the two databases were cross-referenced to assemble an all-inclusive permit database for the time period from 2001 to 2011.

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

Notably, the permit data reflect all permits issued in any area under the jurisdiction of Cowlitz County, including unincorporated urban growth areas, at the time the permit was issued. Therefore, permit data for unincorporated UGAs is reported in the permit totals for the unincorporated County assessment units rather than the City assessment units. It is also worth noting that shoreline exemptions are generally not captured in the permit data. Therefore, no data on the type and extent of development actions exempt from shoreline permits (such as single-family residential housing development or single-family residential bulkhead construction) are available. Moreover, any unpermitted development is not reflected in the data.

2.2 Likely Effects of Development

The effects of likely development were then evaluated in the context of SMP provisions, as well as other related plans, programs, and regulations. For the purpose of evaluating impacts, areas with a likelihood of high densities of new development were evaluated in greatest detail.

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

3 SUMMARY OF EXISTING CONDITIONS

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.. More detailed information on specific shoreline areas is provided in the Shoreline Analysis Report.

The County includes portions of four Water Resource Inventory Areas (WRIAs), including the western portion of the Lewis Watershed (WRIA 27), the Cowlitz Watershed (WRIA 26), the eastern tributaries in the Grays-Elochoman Watershed (WRIA 25), and the southern portion of the Chehalis Watershed (WRIA 23). Assessment Units include the following, as identified and delineated in the Shoreline Analysis Report:

- 1- Columbia River
- 2- Lewis River
- 3- Kalama River
- 4- Cowlitz River
- 5- Mill, Abernathy, Germany Creeks
- 6- South Fork Chehalis River

The County is predominantly rural in nature, with unincorporated areas comprising most of the land area. Development in the County is concentrated in and around the incorporated cities of Castle Rock, Kalama, Kelso, Woodland, and Longview. Existing shoreline functions are typically most impacted in areas of more intensive development.

The County's shorelines comprise approximately 24,202 acres. Federal lands make up 8.5 percent of the County's shoreline acreage, or 2,064 acres total. The federal entities that own the majority of the federal land are the U.S. Forest Service (USFS) and the National Park Service (NPS). State-owned lands occupy another 14.7 percent of the total shoreline acreage, or 3,555 acres. Discussion of uses of federal lands is limited because the proposed SMP will only apply to actions undertaken by non-federal parties on those lands.

All streams and rivers that have mean annual flow of 1,000 cfs or greater are considered Shorelines of Statewide Significance. This applies to the entirety of the Columbia River, Cowlitz River, Lewis River, and mainstem Toutle River, and to the Kalama River downstream from the National Forest boundary. All lakes greater than 1,000 acres are also considered Shorelines of Statewide Significance. Merwin Lake, Yale Reservoir, and Silver Lake (each listed in WAC 173-20-190) meet this criterion.

3.1 Columbia River

Existing conditions along the Columbia River provide a reflection of past land use. Extensive diking of the shorelines occurred to protect agricultural fields from flooding, and as a consequence, large areas of the floodplain were isolated from the river. The commercial fishing industry led to the extensive construction of canneries, warehouses, fish traps, and other similar structures along the shores and in the river (Christy and Putera 1992, Lichatowich 1999). The piles associated with many derelict structures are still present today in many places along the River. Timber production and transport also developed during this period, shaping the vegetative landscape.

Today, the Columbia basin supports significant water-dependent commercial and industrial uses, including pulp mills, aluminum plants, and commercial fishing. Agriculture is also a significant land use in the basin. Recreational activities include fishing, boating, hiking.

Flow regulation and diking in the Columbia River have eliminated or limited tidal inundation and disconnected the river from its floodplain, limiting natural disruptions that form new wetlands and create shifting mosaics of wetland habitats (Bottom et al. 2005). Furthermore, channel dredging and flow regulation in the Columbia River have combined to consolidate the river current into a single channel and reduce flow through peripheral wetland and marsh habitats (Bottom et al. 2005). The combination of dikes and water flow regulation has contributed to a 62 percent loss in the shallow water habitat available to juvenile Chinook salmon in the lower estuary (Kukulka and Jay 2003). However, over half of the shoreline area within the Columbia River assessment unit remains in the channel migration zone and/or floodplain, and significant wetlands (approximately 1,649 acres) are present.

The 21 dams built in the Columbia and Snake Rivers since 1933 have substantially altered the Columbia River hydrograph. Dam operations have reduced the frequency of spring freshets, which historically aided the migration of juvenile salmon and helped maintain floodplain habitat connectivity. Today, over-bank flows and associated large woody debris recruitment and sediment transport processes have been substantially reduced.

Historic and ongoing dredging operations are responsible for maintaining a viable navigation channel to support five deep-water ports (two in Cowlitz County), which transport 30 million tons of goods annually. However, the dredge operations also have limited the natural formation of new estuarine marshes (Bottom and Simenstad 2001).

Today, hundreds of fish and wildlife species reside in or migrate through the Lower Columbia River and its estuary. Current wild populations of salmon in the Columbia River basin represent only 12 percent of their historic numbers (Bottom et al. 2005). The period of estuarine residency provides opportunities for juvenile salmon (particularly fall Chinook salmon). Shallow water habitats may provide spatial separation from

aquatic predators that reside in deeper waters, improved protection from predators through higher turbidity levels (Gregory and Levings 1998), as well improved foraging capacity (Levings et al. 1991). In the Lower Columbia, salmonids are primarily impacted by disconnected or lost habitats. Predation impacts from Caspian terns and northern pikeminnow are also significant.

In general, the islands and confluences of major river mouths with the Columbia River provide some of the least altered shoreline habitats in the assessment unit. Lower functioning reaches in the Columbia River represent areas of intensive transportation (port and railroad) infrastructure, with levees, overwater structures, extensive impervious surfaces, and limited shoreline vegetation.

3.2 Lewis River

Three dams in the upper watershed have significant effects throughout the basin. The dams block access to approximately 80 percent of historic steelhead spawning habitat. The dams affect peak flows and baseflows, restrict downstream transport of LWD, and affect natural sediment transport processes. Per provisions in the FERC settlement agreement (PacifiCorp 2004), PacifiCorp began a program in 2011 to reintroduce anadromous fish to 170 miles of habitat upstream of the dams. To offset habitat impacts resulting from continued operation of its hydroelectric projects on the Lewis River, PacifiCorp Energy manages 10,085 acres around the reservoirs in accordance with the Lewis River Shoreline Management Plan (PacifiCorp 2008a) and the Lewis River Wildlife Habitat Management Plan (PacifiCorp 2008b). The Wildlife Habitat Plan includes goals, objectives, actions, and monitoring plans for habitats within the managed area (PacifiCorp 2008b). Despite sediment retention above the dams, landslides below the dams on the North Fork Lewis River appear to provide sufficient spawning gravels to the lower North Fork (Steel et al. 2007).

Most of the Upper North Fork Lewis is within the Gifford Pinchot National Forest or the Mt. St. Helens National Volcanic Monument. The majority of the headwaters of the basin are forested and in public ownership; active logging was common until the 1980s, but current logging activities are greatly reduced. Current vegetation in the Upper North Fork Lewis watershed is a mix of early, mid, and late seral stage forests, various aged clear-cuts, native grasslands, shrubs, burned areas, and rock and snow in the higher elevations (Steel et al. 2007).

The upper watershed is heavily-forested and largely managed for public and private industrial timber production. However, in recent years, the area has seen increased demand for recreational use and residential development (EA Engineering in Wade 2000). Where human disturbance occurs in the upper Lewis River watershed, it is typically limited in extent and associated with small tributaries or sheltered coves.

Agriculture and residential uses dominate the lower valley. The only urban area in the subbasin is the City of Woodland. As described in the Shoreline Analysis Report, ecological functions in the reaches in the lower Lewis River downstream from the City of Woodland (Reaches 1-5) are significantly degraded. The shorelines in these lower reaches are lined with levees, devoid of native vegetation, and lack habitat complexity. Despite significant degradation of natural shoreline functions of the lower Lewis River, the agricultural fields in the area do likely provide winter foraging habitat for migratory birds. These reaches also experience tidal influence from the Columbia River estuary, and therefore have the potential to provide low energy rearing habitats for juvenile salmon, although the lack of shoreline complexity significantly limits the realization of such potential. As a result of their position in the lower watershed, these reaches score highly for hyporheic functions compared to steeper and naturally confined reaches in the upper watershed.

In contrast to the heavily modified shorelines in the lower Lewis River, the shorelines of Lake Merwin (Reaches 27-37) and Yale Lake (Reaches 38-50) provide well-vegetated shoreline habitats. Although the vegetated and habitat conditions of these reservoirs score highly, the three mainstem dams alter the natural hydroperiod of the lakes and downstream areas, limit longitudinal connectivity in the watershed, create fish passage barriers, and restrict downstream transport of sediment and large woody debris.

3.3 Kalama River

Approximately 96 percent of the Kalama River Watershed is owned and managed by private timber companies. Most of the watershed was logged in the 1960s through the early 1980s. As a result, existing forest stands are young, and an extensive road network (1,292 miles) covers the forestry lands, with a road density of 5.75 miles per square mile (Lewis County GIS 1999 cited in LCFRB 2010). Although the banks of the Kalama River are generally considered to be stable, the proportion of fine sediment in the river substrate is likely related to past forestry practices and road densities (Wade 2000). The upper watershed is within the Mount Saint Helens National Volcanic Monument, which is primarily managed for natural resource conservation.

Stand-replacing fires, which burned large portions of the basin between 1902 and 1952, have had lasting effects on basin hydrology, sediment transport, soil conditions, and riparian function. Large woody debris (LWD) is limited throughout the mainstem river and all of the major tributaries, and given the degraded nature of existing riparian conditions, future recruitment of LWD is also limited (Wade 2000).

As noted in the Shoreline Analysis Report, functional scores in the Kalama River watershed were generally higher compared to other watersheds in the County. The City of Kalama is the only urban area in the subbasin.

The lower Kalama River has the most impaired functions in the assessment unit. Floodplain processes are impaired by armoring and levees that cover the majority of the

shoreline length; much of the armoring is designed to protect Kalama River Road, which runs parallel to the lower Kalama River. As a result of development and channelization of the river the density of LWD is poor in the lower River. Extensive industrial development has occurred within the historic floodplains in the lower two miles of the Kalama, especially to the west of Interstate 5. Given the naturally steep topography of the Kalama River throughout much of the basin, isolation of floodplain habitats in the lower river exacerbates a natural limiting factor (Wade 2000). Residential development has increased along the lower river as well. The lower ten miles of the Kalama River are impaired by high water temperatures.

3.4 Cowlitz Watershed

The Cowlitz River assessment unit is the largest assessment unit, accounting for over half of the shoreline area in the County. Forestry is by far the most dominant land use for all subbasins within the Cowlitz watershed. Despite a history of logging, the watershed still includes several areas of mature forests. Within Cowlitz County, nearly 20 percent of the watershed's shorelines are in agricultural use.

The 1980 eruption of Mt. St. Helens dramatically degraded the habitat conditions of the Toutle River system and the mainstem Cowlitz River below the mouth of the Toutle. Melted ice, ash, and pumice eroded down the Toutle Valley into the Cowlitz River, and carried coarse sandy material and debris to the Columbia River. The eruption wiped out areas of existing forests, which are now recovering in young vegetative conditions.

Following the eruption, the debris flows filling the rivers caused concern for potential flooding of the Cities of Castle Rock, Kelso, and Longview. In response to this concern, the U.S. Army Corps of Engineers (Corps) removed over 74 million cubic yards of material from the Cowlitz River. Floodplain areas along portions of the lower Cowlitz and Toutle Rivers were filled with the fine sediment from dredge spoils. In order to limit future downstream sedimentation and associated flood risk in the North Fork Toutle River, the Corps constructed a sediment retention structure (SRS) on the North Fork Toutle River. The 125 foot tall and 2,200 foot long SRS totally blocked volitional upstream access to as many as 50 miles of habitat for anadromous fish (Corps 2007). Despite the SRS, a significant quantity of sediment is continuing to move through the Toutle system into the Lower Toutle and Lower Cowlitz Rivers. Because of continued filling of the sediment retention structure, the Corps is planning to raise the height of the spillway by 10 feet within the next year in order to reduce downstream sediment delivery and provide additional flood control measures in the Cowlitz River downstream of the Toutle confluence (Corps 2012).

Also following the eruption of Mount St. Helens, two new shoreline lakes, Coldwater Lake and Castle Lake, were created by lahars blocking the North Fork Toutle channel. In order to prevent catastrophic failure of the new earthen berms that formed these lakes, the Corps of Engineers constructed hardened spillway channels at their outlets.

The mainstem Cowlitz and many tributaries have experienced losses in key habitat areas and habitat diversity for most salmonid life stages due to channel simplification and diking. Below the confluence with the Toutle River, the Cowlitz River channel is extensively armored and diked, and most of the floodplain has been filled with deposits from the eruption of Mt. St. Helens (Wade 2000). Grazing, agriculture, forestry, and residential and commercial development have contributed to a reduction in riparian function, increased bank instability, and added fine sediments. The watershed includes a significant area of highly erodible soils. The greatest erosion problems occur as a result of ground disturbance from road building and other activities associated with logging. Water quality is generally good within the Cowlitz River, but elevated water temperatures and turbidity are a concern in the Coweeman watershed.

As described in the Shoreline Analysis Report, Cowlitz River reaches north of the City of Kelso had the lowest functional scores compared to other reaches in the Cowlitz Assessment Unit. The Cowlitz River is artificially constrained by levees in these reaches and shoreline vegetation is limited. Reaches near the northern County border occur on a broad floodplain with significant riparian wetland areas. Functional scores in these northern reaches are amongst the highest for Cowlitz River reaches. Shorelines on Silver Lake are varied, including some high scoring, undeveloped reaches, and other degraded reaches with extensive residential development.

3.5 Mill, Abernathy, Germany Creeks

Ecological functions in Mill, Abernathy, and Germany Creeks are primarily influenced by forest harvest activities, agriculture, and rural residential development. The upper watershed area is heavily forested and largely managed for public and private industrial timber production. Historic logging contributed to the degradation of riparian and instream habitat, although riparian and forest conditions are recovering. The middle reaches have considerable agricultural and development impacts, including limited riparian buffers and disconnected floodplains. The lower reaches of Germany Creek flow through predominantly agricultural land uses, and the Creek is somewhat entrenched. Large woody debris has the potential to restore a more natural channel form, but the debris has been periodically removed from the Creek by local residents (Wade 2002). Floodplain connectivity throughout lower Mill Creek has been impaired by historic splash damming, which has resulted in an incised channel along most of the lower 1.5 miles (Wade 2002). Similarly, the lower five miles of Abernathy Creek are incised and confined by adjacent roads and railroads (Wade 2002). Excessive fine sediment has been observed in lower Germany Creek; the source of fine sediment may be a combination of adjacent agricultural erosion and upstream mass wasting (Wade 2002).

The Coal Creek delta offers potentially important tidal freshwater rearing habitats for juvenile salmonids, as well as vegetated marshes that provide habitat for birds and other wildlife; however, the pumping station on Coal Creek Slough limits fish passage.

3.6 South Fork Chehalis River

Dominant land use in the upper South Fork is commercial forestry, and agricultural uses predominate in the lower river. Both agricultural and forestry uses have resulted in significant alterations to the shorelines of the South Fork Chehalis River. Today, riparian vegetation is limited in extent and maturity compared to historic conditions (Grays Harbor County Lead Entity 2011). The South Fork contributes to high sediment loads in the mainstem Chehalis River; these sediment loads are likely related to a high density of forest roads and logging practices that affect headwater streams, as well as erosion associated with agriculture (Grays Harbor County Lead Entity 2011). Culverts throughout the South Fork Chehalis River present fish passage barriers for anadromous salmonids (Grays Harbor County Lead Entity 2011).

4 FUTURE DEVELOPMENT

To understand what future development activities in the County's shorelines might occur that could alter existing conditions, this chapter presents the results of an assessment of likely future development. This assessment is based on existing land use conditions, recent trends in land use changes, permit history, and proposed future development. This approach is generally 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.

4.1 Summary of Land Use Trends

A comparative analysis of land use data for the years 2002 and 2012 was conducted to evaluate recent changes in land use, and assess the relative scale and types of land use change that may be anticipated in the future.

At the County level, assessor data indicate that a 492-acre reduction in the acreage of vacant lands occurred between the years 2002 and 2012. Over the same time period, single family residential development increased by 342 acres. These findings suggest that during this time period significant single family residential development took place on lands that were previously vacant. The data also indicate that smaller amounts of vacant lands were converted for transportation, recreational, and agricultural uses.

In addition to a reduction in the acreage of vacant lands, land use trends also show a decrease in parcel size in the County's shorelines, which suggests that land subdivision was also actively occurring during this time period.

Changes in the amount of vacant lands in each assessment between the years 2002 and 2012 are suggestive of the amount of development activity occurring in each assessment unit. The greatest reduction in vacant land area was concentrated in the Columbia River (344 acres) and Cowlitz River (266 acres) Assessment Units. Smaller reductions in vacant lands were observed in the Kalama (22 acres) and Lewis (25 acres) Assessment Units. Assessment units with limited change in vacant lands include the South Fork Chehalis and Mill, Abernathy, Germany Creeks Assessment Units. Note that an increase in vacant land identified in the High-intensity environment designation in the Mill, Abernathy, Germany Creek watershed was a result of a change in land classification of a large area (over 200 total acres) associated with the Port of Longview that was excluded as vacant in 2002 (due to its “public exempt” tax status), but now meets the criteria for vacant land.

A summary of the area of vacant lands converted in relation to the proposed shoreline environment designations is provided in Figure 4-1. This graphic suggests that the largest area of development has occurred in the proposed Rural Conservancy environment designation (the geographic extent of this designation can be seen on the shoreline environment designations map).

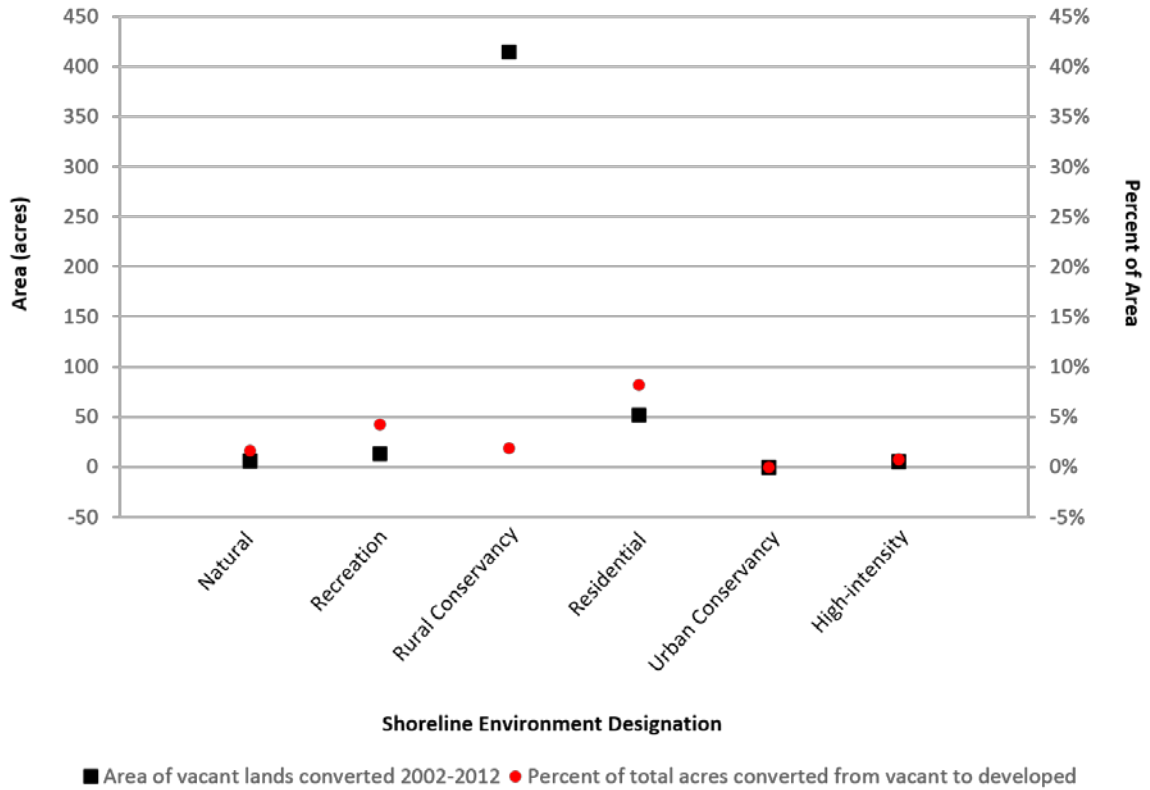


Figure 4-1. Area and proportion of total lands by proposed environment designation converted from vacant to developed from 2002-2012 in unincorporated Cowlitz County.

4.2 Summary of Permit Trends

A review of shoreline development permits previously issued by Cowlitz County was undertaken in order to better understand the type and extent of recent development actions occurring in the County, and to help anticipate future trends in shoreline land use changes and shoreline modifications. The development permits reviewed were limited to those issued between 2001 and 2011.

Over the 11-year permit evaluation period, a total of 152 shoreline permits were issued by the County. Of that total, 98 permits were for shoreline uses; 54 permits were for shoreline modifications. The most common use permits issued were for port activities (25), followed by commercial/industrial (18), and utilities (15) (Figure 4-2). The most common modification permits issued were for dredging and landfill activities (20), followed by bridges and culverts (13), and overwater structures (13) (Figure 4-3).

The assessment unit with the greatest amount of shoreline permit activity was the Columbia River Assessment Unit (70 permits). Three assessment units had

moderate levels of shoreline permit activity: the Cowlitz River Assessment Unit (25 permits), the Lewis River Assessment Unit (32 permits, generally limited to dam, park, and fish hatchery improvement projects), and the Kalama River Assessment Unit (19 permits). The assessment units with the least amount of shoreline permit activity were the Mill, Abernathy, and Germany Creeks Assessment Unit (6 permits) and the South Fork Chehalis River Assessment Unit (no permits).

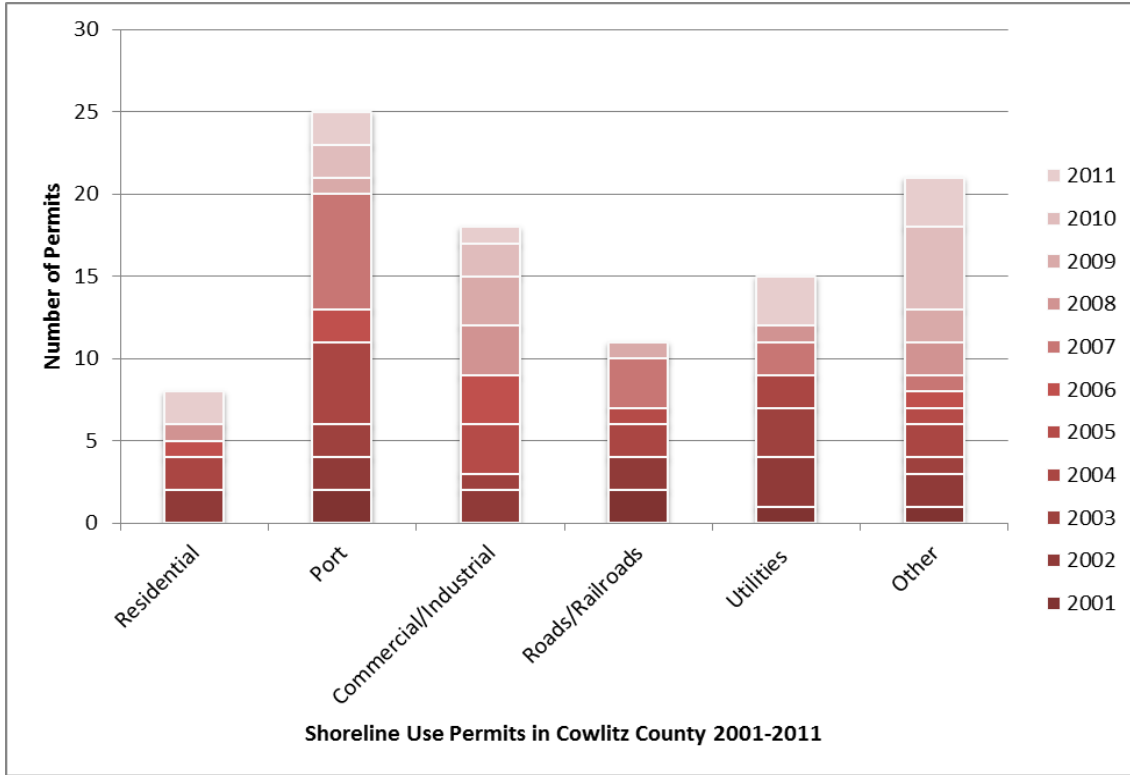


Figure 4-2. Shoreline use permit issuance data in unincorporated Cowlitz County (Source: Cowlitz County).

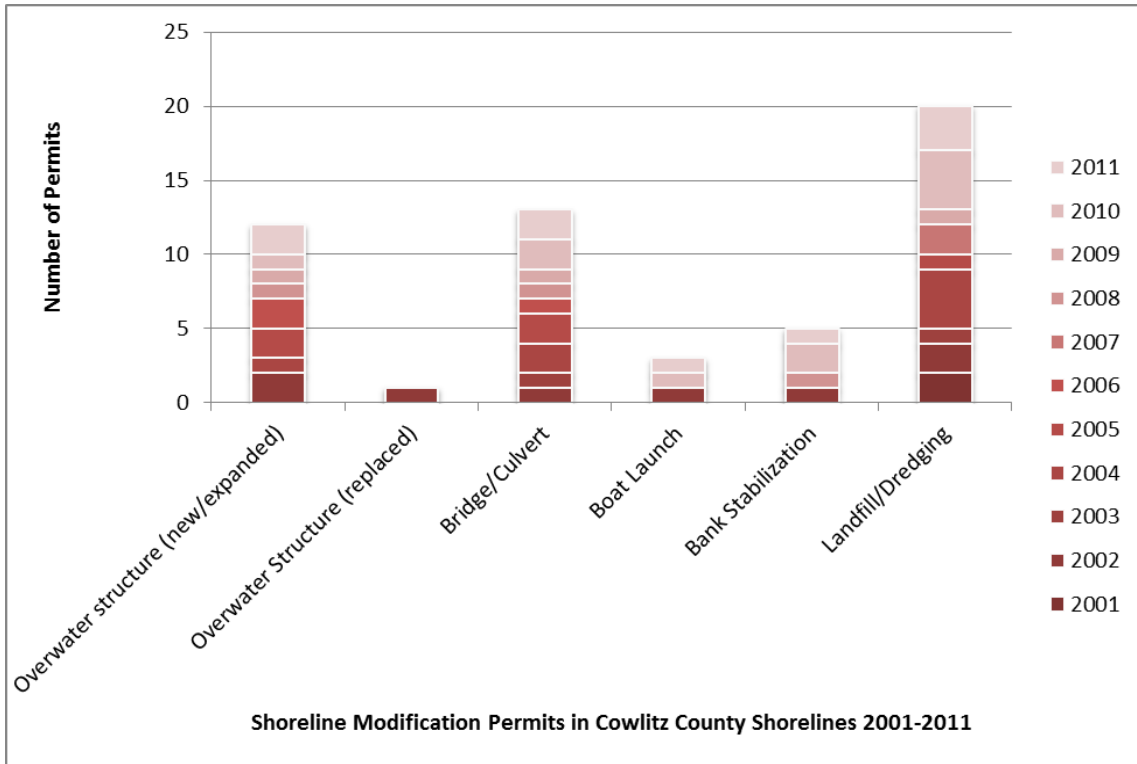


Figure 4-3. Shoreline modification permit issuance data in unincorporated Cowlitz County (Source: Cowlitz County).

4.3 Proposed Future Development

In addition to looking at past development and permitting trends, some presently proposed development could have impacts on the County’s shorelines. Most notably, the proposed coal export facility at Millennium Bulk Terminal in the Longview area includes the dredging of two berthing areas for Panamax-class ships. The potential environmental impacts of a new coal export facility is under review by Cowlitz County, Ecology, and the Corps, and the project is currently undergoing a full review under the State Environmental Policy Act and the National Environmental Policy Act. This project will be required to demonstrate no net loss of ecological functions on an individual project basis.

4.4 Summary of Future Development

The results of this assessment indicate that in the years between 2002 and 2012 vacant lands in the County were primarily converted for single family residential use, but also to a lesser extent for transportation, recreational, and agricultural use. Both the land use trends and permit trends data indicate that the greatest amount of development activity, perhaps unsurprisingly, has been occurring in the Cowlitz and Columbia River Assessment Units. In terms of the proposed shoreline environment designations, this assessment suggests that the largest area of development has occurred in the proposed Rural Conservancy and Residential environment

designations. Under the rationale that future changes in land use trends will be roughly comparable to past trends, these amounts, types, and locations of development should generally be expected to continue in the future. Finally, some unique developments that cannot be anticipated by reviewing data about the past, particularly the Millennium Bulk Terminal, may take place on County shorelines.

The potential impacts of expected future development, as well as provisions that the proposed SMP includes to protect the County's shorelines from adverse impacts, are reviewed in Chapter 5.

5 EFFECTS OF DEVELOPMENT WITH APPLICATION OF THE SMP

This chapter describes how foreseeable development could affect shoreline conditions, and what specific provisions of the proposed SMP will help maintain existing conditions in spite of likely future development. This chapter begins, in Section 5.1, with a summary of the County's proposed environment designation scheme and a discussion of how the scheme allocates allowed uses by relating environment designations to ecological functions. Section 5.2 presents key general standards and regulations in the SMP intended to protect the ecological functions of the shoreline. Section 5.3 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.

Chapter 5 concludes, in Section 5.4, with a discussion of the potential beneficial effects of the Shoreline Restoration Plan.

5.1 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
- Residential
- Urban Conservancy
- Rural Conservancy
- Natural
- Recreation
- Aquatic

The **High-intensity** environment designation is intended to provide areas for high-intensity, water-oriented commercial, transportation, and industrial uses while protecting existing ecological functions and seeking to restore ecological functions where they are degraded. Within this designation, priority should be given to water-dependent, water-related, and water-enjoyment uses. The designation is appropriate for those shoreline areas within urban growth areas, and industrial or commercial limited areas of more intensive rural development if they currently support or are planned for high-intensity uses related to commerce or transportation. Approximately 662.3 acres, or 2.7 percent of the County's shorelines (see Figure 5-1) are designated High-intensity environment.

The purpose of the **Residential** environment designation is to accommodate residential development and appurtenant structures that are consistent with the SMP, including single-family and multi-family development. The designation is appropriate for those shoreline areas within urban growth areas, rural areas of more intense development, or master planned resorts, if they are predominantly single-family or multi-family residential development or are planned and platted for residential development. Approximately 589.5 acres, or 2.4 percent of the County's shorelines (see Figure 5-1) are designated Residential environment.

The purpose of the **Urban Conservancy** environment designation is to protect and restore ecological functions of open space, floodplain, and other sensitive lands where they exist in urban and developed settings, while allowing a variety of compatible uses including recreational areas, facilities, and utilities. Activities

permitted are intended to have minimal adverse impacts upon the shoreline. This designation is appropriate for areas where development could occur while having the ability to maintain or restore ecological functions of the area, and that are not generally suitable for intensive water dependent uses. Approximately 19.4 acres, or 0.1 percent, of the County's shorelines (see Figure 5-1) are designated Urban Conservancy environment.

The purpose of the **Rural Conservancy** environment designation is to protect ecological functions, conserve existing natural resources and valuable historic and cultural areas in order to provide for sustained resource use, achieve natural floodplain processes, and provide recreational opportunities. Examples of appropriate uses within this environment designation include low-impact outdoor recreation uses, timber harvesting on a sustainable-yield basis, agricultural uses, aquaculture, low-intensity residential development, utilities, and other natural resource-based low-intensity uses. The designation is appropriate for shoreline areas outside of incorporated municipalities and outside of urban growth areas that currently support lesser-intensity resource-based, residential, or recreational uses. Approximately 22,125.7 acres, or 91.4 percent of the County's shorelines (see Figure 5-1) are designated Rural Conservancy environment.

The purpose of the **Natural** environment designation is to protect those shoreline areas that are relatively free of human influence or that include intact or minimally degraded shoreline functions. These systems require that only very low-intensity uses be allowed in order to maintain the ecological functions and ecosystem-wide processes. The designation is appropriate for shoreline areas that are ecologically intact and performing important ecological functions or are considered to represent ecosystems and geologic types that are of particular scientific and educational interest. Additionally, the Natural environment designation is appropriate for shorelines that are unable to support development or uses without significant adverse impacts to ecological functions or risk to human safety. Approximately 511.9 acres, or 2.1 percent of the County's shorelines (see Figure 5-1) are designated Natural environment.

The **Recreation** environment designation is intended to provide areas for new and continued recreational and public access opportunities along shorelines, including public and private parks and recreational facilities. An additional purpose is to maintain ecological functions and open space. The designation is appropriate for shoreline areas where public and private lands are devoted to or designated for recreation use, including parks and open space and water-dependent uses such as marinas which provide recreational moorage, as well as where lands are not yet developed but are planned for water-oriented recreation. Approximately 293.7 acres, or 1.2 percent of the County's shorelines (see Figure 5-1) are designated Recreation environment.

Finally, the **Aquatic** environment designation is intended to protect, restore, and manage the unique characteristics and resources of aquatic areas. The designation is applied to all waters and submerged lands in the County waterward of the ordinary high water mark (OHWM) of shorelines of the state.

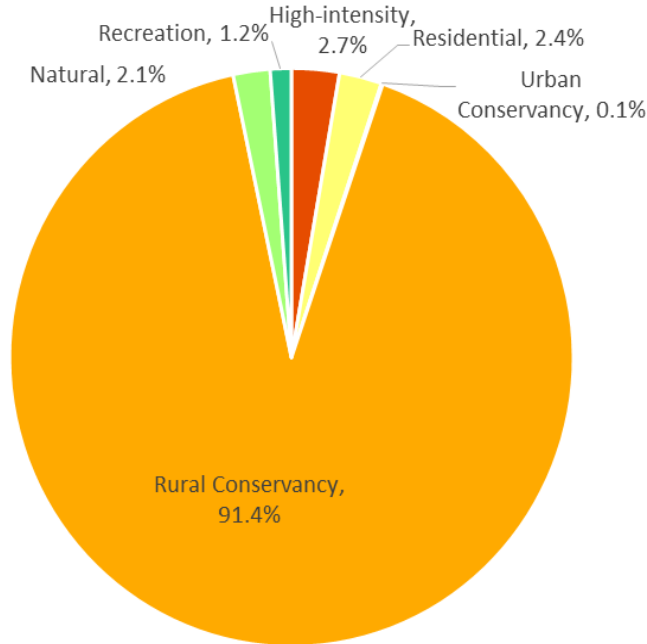


Figure 5-1 Distribution of Shoreline Environment Designations in Unincorporated Cowlitz County

The analysis of shoreline functions presented in the Shoreline Analysis Report was used to guide the assignment of environment designations. Figure 5-2 shows a general association between more protective shoreline environment designations and higher-functioning shorelines. Shorelines with higher levels of existing impairments are associated with shoreline environment designations that allow more intensive development (i.e. High-intensity). On the other hand, the Natural designation includes higher functioning shorelines. Rural Conservancy, the shoreline designation covering the majority of shoreline area, is predominantly composed of shorelines with Moderate and Moderate-High levels of functions. This designation will need to balance planned land use with protection of existing functions. Overall, this analysis indicates that the shoreline environment designations proposed by the County are generally consistent with the approach of concentrating higher intensity uses in more degraded areas and provide greater regulatory protection for areas with a higher level of existing functions. A few notable exceptions to this general trend are the Moderate-High functioning shorelines in the High-intensity, Recreation, and Residential designations. These discrepancies can be attributed to the limited land area within each of the above mentioned designations, and the weighting of planned land use within the County.

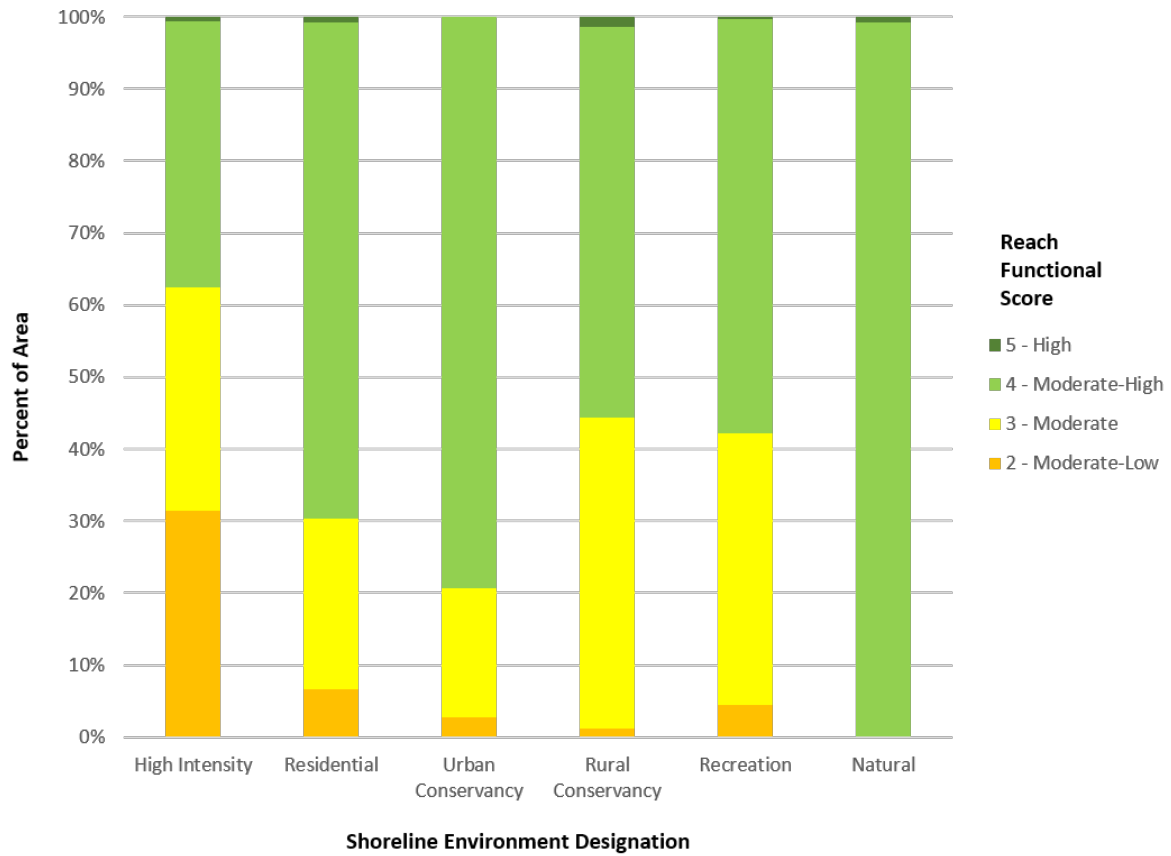


Figure 5-2. Distribution of Functional Scores from the Shoreline Analysis Report among Proposed Cowlitz County Environment Designations

The Shoreline Use, Modification, and Standards Table (SMP Section 7.1) 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 the Shoreline Use, Modification, and Standards 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 new development. Additionally, allowed uses are subject to the general provisions of the SMP (see Section 5.2), as well as the provisions specific to that use or modification (see Section 5.3). 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.

5.1.1 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.

The areas where potential use conflicts are the most possible include areas designated for high-intensity uses. These areas have largely been established in large contiguous areas of the Columbia River shoreline in the Longview area (generally extending from Barlow Point to the Cowlitz River), the Kalama area (from south of Carrol's Channel to near the Todd Road interchange), and the Woodland area (in the Martin's Bar area south of Burke Island and the Austin Point area north of the Lewis River). These areas provide a large contiguous area of primarily port uses.

In the Longview area, there are no adjacent uses that are likely to present use conflicts with the preferred water-oriented uses of the proposed High-intensity shoreline environment designation. Outside of Kalama, a recreational use along the north shore of the Kalama River has co-existed with port use without apparent conflicts. The residential area south of the Port of Kalama is reasonably well buffered from port uses by distance, but experiences some conflicts when access across the rail corridor is blocked by train movement. The port and industrial facilities in the Woodland area are generally bounded by open space, although a recreational vehicle park abuts the Martins Bar area and is located between two areas zoned Heavy Manufacturing and proposed to be designated High-intensity. The proposed SMP designates the park's shorelines as Recreation environment. However, this use is not allowed by existing zoning and is a conditional use in the proposed SMP. The use may continue as legally non-conforming or be phased out into a conforming water-oriented use in the future.

5.2 General Shoreline Regulations

General standards and shoreline use and development regulations are contained in SMP sections 5.5 and 6.1 through 6.7. Topics include Shorelines of Statewide Significance, no net loss of ecological functions, critical areas within shoreline jurisdiction, flood prevention and flood damage minimization, shoreline vegetation conservation, and water quality and quantity. These provisions include several standards and regulations intended to protect ecological functions of the shoreline

and to prevent adverse cumulative impacts. Key regulations protective of ecological functions, grouped by SMP section, are listed below.

5.2.1 Shorelines of State-Wide Significance

Shorelines of the Columbia, Cowlitz, Coweeman, mainstem Toutle, and Lewis Rivers, and shorelines of the Kalama River downstream from the National Forest boundary are shorelines of state-wide significance within Cowlitz County. Merwin Lake, Yale Reservoir, and Silver Lake shorelines are also shorelines of state-wide significance. Because these shorelines are major resources from which all people in the state derive benefit, the SMP gives preference to uses which favor long-range goals and support the overall public interest (Table 5-1).

Table 5-1. Summary of key regulations related to shorelines of state-wide significance that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Shorelines of State-Wide Significance (5.5)	Preserve the natural character of the shoreline. a. Designate and administer shoreline environments and use regulations to minimize damage to the ecology and environment of the shoreline as a result of man-made intrusions on shorelines. b. Restore, enhance, and/or redevelop those areas where intensive development or uses already exist in order to reduce adverse impact on the environment and to accommodate future growth rather than allowing high-intensity uses to extend into low-intensity use or underdeveloped areas. c. Protect and preserve existing diversity of vegetation and habitat values, wetlands, and riparian corridors associated with shoreline areas. (A.)(2.)	X	X	X	X
	Support actions that result in long-term over short-term benefit. a. Evaluate the short-term economic gain or convenience of developments relative to the long-term and potentially costly impairments to the natural shoreline. b. Protect resources and values of shorelines of state-wide significance for future generations by modifying or prohibiting development that would irretrievably damage shoreline resources. (A.)(3.)	X	X	X	X
	Protect the resources and ecological function of the shoreline. a. Minimize development activity that will interfere with the natural functioning of the shoreline ecosystem, including, but not limited to: stability, drainage, aesthetic values and water quality. b. All shoreline development should be located, designed, constructed, and managed to avoid disturbance of and minimize adverse impacts to wildlife resources, including	X	X	X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	spawning, nesting, rearing and habitat areas and migratory routes. c. Balance public access demands with the need to preserve shoreline ecology. Public access shall be discouraged where it has the potential to impact sensitive shoreline resources. d. Shoreline materials including, but not limited to, bank substrate, soils, beach sands and gravel bars should be left undisturbed by shoreline development. Gravel mining should be severely limited in SSWS shoreline areas. e. Preserve environmentally sensitive wetlands for use as open space or buffers and encourage restoration of currently degraded wetland areas. (A.)(4.)				

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

5.2.2 No Net Loss of Ecological Functions

The SMP includes provisions that require mitigation sequencing, which involves first avoiding, then minimizing any impacts (Table 5-2). Where impacts are unavoidable, compensatory mitigation is required, as well as monitoring. These provisions apply to all shoreline uses and modifications, and should help ensure that no net loss of functions is maintained on a cumulative basis in the County.

Table 5-2. Summary of key regulations related to no net loss that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
No Net Loss of Ecological Functions (6.1)	All shoreline use and development, including preferred uses and uses that are exempt from permit requirements, shall be located, designed, constructed, conducted, and maintained in a manner that maintains shoreline ecological functions, in accordance with the mitigation sequencing provisions of the SMP. (A.)	X	X	X	X
	Shoreline ecological functions that shall be protected include, but are not limited to, fish and wildlife habitat, food web support, and water quality maintenance. (B.)	X	X	X	X
	Shoreline processes that shall be protected include, but are not limited to, water flow; erosion and accretion; infiltration;	X	X	X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	groundwater recharge and discharge; sediment delivery, transport, and storage; large woody debris recruitment; organic matter input; nutrient and pathogen removal; and stream channel formation/maintenance. (C.)				
	Applicant must provide mitigation sequencing analysis if a proposed shoreline use or modification is addressed in any part by discretionary standards; when an action requires a shoreline conditional use permit or shoreline variance; or when specifically required by the SMP. (D.)	X	X	X	X
	An application for any permit or approval shall demonstrate all reasonable efforts have been taken to provide sufficient mitigation such that the activity does not result in net loss of ecological functions. Mitigation shall occur in prioritized order. (E.)	X	X	X	X
	Applicants for permits have the burden of proving that the proposed development is consistent with the criteria set forth in this SMP, including demonstrating all reasonable efforts have been taken to provide sufficient mitigation such that the activity does not result in net loss of ecological functions. (H).	X	X	X	X

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

5.2.3 Critical Areas within Shoreline Jurisdiction

The proposed SMP requires that activities within shoreline jurisdiction comply with the County’s Critical Areas Regulations, which are adopted by reference and incorporated into the SMP with certain clarifications and modifications (SMP Section 6.3.2). In particular, the provisions addressing nonconforming activities; exemptions for utility activities; exemptions for building modifications; reasonable use exceptions; and variances found in the Critical Areas Regulations do not apply in shoreline jurisdiction. Additionally, buffers for shorelines of the state are defined directly in the SMP under Section 7.1, Table 7-2.

Critical areas within shoreline jurisdiction include wetlands, fish and wildlife habitat conservation areas, frequently flooded areas, geologically hazardous areas, and critical aquifer recharge areas. A discussion of the applicable regulations, and the anticipated outcome, is provided below for general provisions as well as for each type of critical area.

General Provisions

The proposed SMP includes provisions that apply generally to all critical areas within shoreline jurisdiction, and that are intended to protect the ecological processes and functions of those critical areas (Table 5-3).

Table 5-3. Summary of key general regulations related to critical areas within shoreline jurisdiction that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Critical Areas Protection: General Provisions (6.3.2)	Shoreline uses, activities, developments and their associated structures and equipment shall be located, designed and operated to protect the ecological processes and functions of critical areas. (B.)	X	X	X	X
	New expanded development proposals shall integrate protection of wetlands, fish and wildlife habitat, and flood hazard reduction with other stream management provisions, such as retention of channel migration zones, to ensure no net loss of ecological functions. (C.)	X	X	X	X
	If provisions of the Critical Areas Regulations and other parts of this SMP conflict, the provisions most protective of ecological resources shall apply, as determined by the City. (E.)	X	X	X	X
	Unless otherwise stated, critical area buffers shall be protected consistent with principles of no net loss and in accordance with this SMP and the Critical Areas Regulations. (F.)	X	X	X	X

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

Wetlands

Proposed standard wetland buffers range from 25 feet to 300 feet depending on the wetland rating (as determined by Washington State Wetland Rating System for Western Washington (Ecology Publication No. 14-06-029, or as revised)), land use intensity, and habitat functions scores (Table 5-4). Activities and uses are prohibited in Category I wetlands, unless the activity or use would improve habitat for priority species within the wetland. Activities and uses are decreasingly restricted in Category II, III, and IV wetlands in accordance with their decreasing ecological values. However, impacts to all wetlands, regardless of category, must be mitigated according to the mitigation sequence set forth in the Critical Areas Regulations.

Buffer averaging is allowed provided that the minimum buffer is no less than 75% of the standard buffer or 25 feet, whichever is greater. Buffer reductions are also permitted with associated enhancement of buffer condition. Buffer reductions of 25% of the standard buffer width may be permitted for Category III and Category IV wetlands with a habitat score less than 4 provided that the remaining buffer is enhanced. For Category I and II wetlands, and Category III wetlands with a habitat score of 5 or greater, the standard buffer may be reduced by one land use intensity rating if management measures are implemented and habitat corridors are established. These buffer reduction options provide an incentive for property owners to improve existing buffer conditions.

Table 5-4. Cowlitz County Wetlands Buffer Regulations Summary

Habitat Score in the Rating Form	Low Intensity Use	Moderate Intensity Use	High Intensity Use
Category I or II Wetlands			
Low (<5 points)	50 ft.	75 ft.	100 ft.
Moderate (5 points)	60 ft.	90 ft.	120 ft.
Moderate (6 points)	90 ft.	130 ft.	180 ft.
Moderate (7 points)	130 ft.	195 ft.	260 ft.
High (8 - 9 points)	150 ft.	225 ft.	300 ft.
Category III Wetlands			
Low (<5 points)	40 ft.	60 ft.	80 ft.
Moderate (5 points)	60 ft.	90 ft.	120 ft.
Moderate (6+ points)	75 ft.	110 ft.	150 ft.
Category IV Wetlands			
All	25 ft.	40 ft.	50 ft.

Fish and Wildlife Habitat Conservation Areas

Fish and Wildlife Habitat Conservation Areas (FWHCA) include critical habitats with which endangered, threatened, or sensitive fish and wildlife species have a primary association, state priority habitats and species areas, species and habitats of local importance, and all waters of the state. As mentioned above, standard FWHCA buffers on shoreline waterbodies (Type S) are defined in the SMP (SMP Table 7-2), and range from 50 to 150 feet depending on shoreline environment designation (Table 5-5). Buffers on non-shoreline waters range from 50 to 150 feet as well (Table 5-5). Per SMP Section 6.3.2.A.3.b, development may be allowed in the outer (landward) 25% of the riparian habitat area provided that a Level One Critical Areas Habitat Assessment is completed, which includes identifying sensitive species and habitats, describing existing buffer conditions, avoiding and minimizing impacts, and mitigating for impacts if necessary.

Development may further be permitted in the inner 75% of the riparian habitat area provided that a Level Two Critical Areas Habitat Assessment, which includes a protection plan that details mitigation, construction monitoring, and ongoing management measures. These standards provide significant flexibility in implementation of riparian buffers, and maintenance of riparian functions depends on strict review and implementation of protective terms requiring demonstration that proposed development will not reduce stream or habitat functions. The Washington Department of Fish and Wildlife (WDFW) reviewed past examples of implementation of these provisions to evaluate whether implementation of the provisions has been protective of ecological functions. This analysis defers to the WDFW determination on effects of the proposed riparian areas on shoreline functions, provided as Appendix A.

Table 5-5. Riparian Habitat Area Width by Stream Type

Stream	RHA Width (ft.) ^a
Type S Water (SMP Table 7-2) <ul style="list-style-type: none"> • Natural • Rural Conservancy • Urban Conservancy • Recreation • Residential • High Intensity 	<ul style="list-style-type: none"> • 150 • 150 • 150 • 100 • 50 • Water-related: 50 Other: 100
Type F Water <ul style="list-style-type: none"> • Channel width greater than 20 feet • Channel width less than or equal to 20 feet 	<ul style="list-style-type: none"> • 150 • 100
Type Np Water	50
Type Ns Water	50

^a RHA widths shall be measured horizontally from the ordinary high water mark. Water-dependent uses, modifications, and activities are allowed to have a 0-foot buffer.

Frequently Flooded Areas

Frequently flooded areas are regulated by CCC 16.25, Floodplain Management, which is incorporated into the Critical Areas Regulations by reference. These regulations limit what development may occur in the floodway (CCC 16.25.080(L.)). All lands identified in the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps, as amended, and approved by the County as within the 100-year floodplain, are designated as frequently flooded areas.

Geologically Hazardous Areas

Geologically hazardous areas within shoreline jurisdiction include landslide hazard areas, erosion hazard areas, seismic hazard areas, mine hazard areas, and volcanic hazard areas. Regulations specific to geologically hazardous areas apply

performance standards to minimize and manage risks and ecological impacts. Any development in a geologically hazardous area requires a geotechnical evaluation by a qualified professional.

In areas identified as Volcanic Hazard Zone 1, allowed uses are limited to passive trails, maintenance and repair of existing structures, agriculture, forestry, and scientific investigations. Areas designated as Volcanic Hazard Zone 1 include the upper reaches of the North and South Forks of the Toutle River, the upper Kalama River, and the northeastern portion of Yale Lake.

In erosion hazard areas, the critical areas regulations require an erosion control plan, a seasonal restriction on clearing, and a drainage plan.

A fifty-foot standard buffer is applied to all sides of any landslide hazard areas. The buffer may be reduced to 25 feet on either side of the landslide hazard area, if a qualified professional determines that it is sufficient to protect the proposed development, adjacent developments, and the critical area. The buffer may not be reduced uphill or downslope from the landslide hazard area.

Critical Aquifer Recharge Areas

Activities may only be permitted in a critical aquifer recharge area if the applicant can show that the proposed activity will not cause contaminants to enter the aquifer and that the proposed activity will not adversely affect the recharging of the aquifer.

5.2.4 Flood Prevention and Flood Damage Minimization

In addition to flood hazard protections provided through shoreline critical areas regulations, the proposed SMP includes provisions to reduce flood hazard, avoid increasing flood hazard, and minimize flood damage (Table 5-6). If strictly enforced, these provisions would be expected to protect ecological functions by restricting development within floodways or channel migration zones. The provisions also define standards and regulations for flood hazard management structures, which are discussed in Section 5.3.4 of this document.

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

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Flood	New residential, commercial, or industrial development	X			X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Prevention and Flood Damage Minimization (6.4)	and uses, including subdivision of land, within shoreline jurisdiction are prohibited if it would be reasonably foreseeable that the development or use would require structural flood hazard reduction measures in the channel migration zone or floodway over the life the development. (B.)				
	The following uses and activities may be authorized in floodways or channel migration zones when otherwise permitted by the SMP: 1. Actions and development with a primary purpose of protecting or restoring ecological functions and ecosystem-wide processes. 4. Bridges, utility lines, public stormwater and wastewater facilities and their outfalls, and other public utility and transportation structures, such as dams, where no other feasible alternative exists, or where the alternative would result in unreasonable and disproportionate costs. Where such structures are allowed, mitigation shall address impacted functions and processes in the affected shoreline. 8. Measures to reduce shoreline erosion provided that it is demonstrated that the erosion rate exceeds that which would normally occur in a natural condition, that the measures do not interfere with fluvial hydrological and geomorphological processes normally acting in natural conditions, and that the measures include appropriate mitigation of impacts to ecological functions associated with the river or stream. (C.)	X			X
	Removal of materials for flood management purposes shall be consistent with an adopted flood hazard reduction plan and is allowed only after a biological and geomorphological study shows that extraction has a long-term benefit to flood hazard reduction, does not result in a net loss of ecological functions, and is part of a comprehensive flood management solution. (D.)	X	X	X	X
	In addition to information required as part of a critical areas assessment, information on physical and geological characteristics of the area; biological resources and predicted impacts; predicted impacts to shore and hydraulic processes; and an analysis of alternatives is required as part of an application for development within a flood hazard areas. (F.)	X	X	X	X

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

5.2.5 Shoreline Vegetation Conservation

The proposed shoreline vegetation conservation standards are intended to protect existing shoreline vegetation (Table 5-7). Through minimization and mitigation of impacts, these provisions would be expected to result in no net loss of native shoreline vegetation.

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

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Vegetation Conservation (6.6)	All development shall minimize vegetation removal in areas of shoreline jurisdiction to the amount necessary to accommodate the permitted use. Mitigation sequencing shall be applied unless specifically excluded by the SMP, so that the design and location of the development minimizes short- and long-term vegetation removal. (A.)			X	
	Vegetation within shoreline buffers, other stream buffers, wetlands or wetland buffers, or other critical areas shall be managed consistent with the dimensional standards and critical areas regulations of the SMP. (B.)	X	X	X	X
	Other vegetation within shoreline jurisdiction, but outside of shoreline buffers, other stream buffers, wetlands and wetland buffers, and other critical areas shall be managed according to section 6.1, No Net Loss of Ecological Function, of the SMP, and any other regulations specific to vegetation management in the SMP and CCC. (C.)			X	
	When restoring or enhancing shoreline vegetation, proponents shall use native species that are of a similar diversity, density, and type to that occurring in the general vicinity of the site prior to any shoreline alteration. The vegetation shall be nurtured and maintained to ensure establishment of a healthy and sustainable native plant community over time. (E.)				
	Mitigation plans shall be approved before initiation of other permitted activities unless a phased schedule that ensure completion prior to occupancy has been approved. (F.)			X	
	Aquatic weed control shall only occur to protect native plant communities and associated habitats or where an existing water-dependent use is restricted by the presence of weeds. Aquatic weed control shall occur in compliance with all other applicable laws and standards and shall be done by a qualified professional. (G.)			X	X
	Limbing or crown thinning shall comply with the Tree Care Industry Association pruning standards, unless the tree poses a safety hazard that cannot be eliminated by pruning, crown			X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	thinning, or other technique that maintains some habitat function. No more than 25 percent of the limbs of any single tree may be removed and no more than 20 percent of the canopy cover in any single stand of trees may be removed for view preservation. (H.)				
	Vegetation may be removed from levees, dikes, docks, airports, roads, and railways in accordance with the provisions of the SMP, including the requirement to result in no net loss of ecological functions; as well as applicable federal, state, and local standards. (I.)			X	

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

5.2.6 Water Quality and Quantity

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

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

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Water Quality and Quantity (6.7)	All shoreline development shall comply with the applicable requirements of the County’s Stormwater Manual and best management practices to prevent impacts to water quality and stormwater quantity that would result in a net loss of shoreline ecological functions. (A.)	X	X		
	Stormwater management structures including ponds, basins, and vaults shall be located outside of shoreline jurisdiction where feasible and as far from the water’s edge as feasible and shall minimize disturbance of buffers. Low-impact development facilities (which do not substantially change the character of the shoreline) such as vegetation filter strips, grass-lined swales, and vegetated bioretention and infiltration facilities, are encouraged in association with development allowed in		X	X	

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	shoreline jurisdiction. (B.)				
	Aerial application of pesticides, herbicides, and fertilizers within shoreline jurisdiction is prohibited unless as part of a public agency program for control of noxious species or specific pests, or for quarantine or public health purposes. (C.)		X		
	To avoid water quality degradation, sewer service is subject to the following requirements: 1. Sewage disposal facilities for any proposed use shall meet all applicable Department of Health standards; 2. Any existing septic system or other on-site system that fails or malfunctions will be required to connect to an existing municipal sewer service system if feasible, or make system corrections approved by the Cowlitz County Environmental Health Unit; 3. Any new development, which consists of an occupied use such as a business, park or recreation facility, single-family, or multi-family unit in an Urban Growth Area will be required to connect to an existing municipal sewer service system if feasible, or install an on-site septic system approved by the Cowlitz County Environmental Health Unit. (D.)		X		

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

5.3 Use and Modifications Provisions

The SMP contains numerous shoreline modification and use policies and supporting regulations intended to protect the ecological functions of the shoreline and prevent adverse cumulative impacts. The following tables provide a brief summary of the primary potential ecological impacts that may arise from various shoreline uses and modifications, as well as a summary of the proposed SMP regulations intended to conserve ecological functions and prevent adverse cumulative impacts. Regulations that help ensure that impacts are avoided, minimized, and mitigated include provisions that can be separated in the following three general categories: (1) provisions that allow, condition, or prohibit specific types of development depending on Shoreline Designation; (2) provisions that apply specific standards that help avoid and minimize potential impacts; and (3) provisions that require mitigation of impacts and/or demonstration of no net loss of functions.

The potential impacts described in the tables account for the more significant or most likely impacts, but may not account for the full suite of potential impacts from a

given use or modification. These less significant or less likely impacts, while not specifically discussed below, would be addressed during the permitting process through mitigation sequencing requirements. Also, the listing of potential impacts does not mean that these impacts occur in every instance of a certain use or modification.

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

5.3.1 Boat and Vessel Facilities, including Marinas

Boat and vessel facilities include all in-water and overwater structures for the launching and mooring of boats and vessels. Overwater structures have the potential for a variety of impacts primarily stemming from overwater shading and disturbance of sediment transport. Potential impacts from boat and vessel facilities are summarized below in Table 5-9.

Boat and vessel facilities related to single family residential development are most common on lake shorelines (e.g., Silver Lake); whereas, boating facilities in riverine settings are more commonly related to Port, marina, or industrial facilities. Based on past permitting trends (Section 4.2), occasional (1-2 per year) development of new boating facilities and replacement or expansion of existing facilities may be anticipated in the future.

The SMP generally addresses overwater structures by implementing measures to limit the proliferation of structures and through measures that avoid, minimize and mitigate effects on sediment transport, water quality, and nearshore habitat. Key regulations in the proposed SMP that address potential boat and vessel facility impacts are listed below in Table 5-10.

Table 5-9. Summary of potential impacts from boat and vessel facilities.

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.

Functions	Potential Impacts to Functions
	Loss of habitat for benthic community, less LWD for habitat complexity.

Table 5-10. Summary of key regulations related to boat and vessel facilities that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Boating Facilities- General (7.2.3)(B.)	Shall be sited and designed to ensure no net loss of shoreline ecological functions and shall meet Washington Department of Natural Resources requirements and other state guidance if located in or over state-owned aquatic lands. (1.)(a.)	X	X	X	X
	Shall be located in areas where: i. There is adequate water mixing and flushing; iii. Such facilities will not adversely affect flood channel capacity; iv. Water depths are adequate to minimize channel maintenance; v. The structure would minimize the obstruction of currents, alteration of sediment transport, and accumulation of drift logs and debris; vi. New shoreline stabilization would not be needed; and vii. Water depths are adequate to prevent floating structures from grounding out. (1.)(b.)	X	X	X	X
	Shall not be located along braided or meandering river channels where the channel is subject to change in alignment; on point bars or other accretion beaches. (1.)(c.)	X	X	X	X
	Shall be constructed of materials that will not adversely affect water quality or aquatic plants and animals over the long term. (1.)(e.)		X	X	X
	Lighting associated with overwater structures shall be designed to avoid causing glare on water bodies. Illumination levels shall be the minimum necessary for safety. (1.)(h)				X
	New uses, developments, and activities that are not water-dependent shall be located outside any applicable shoreline buffer unless impossible due to topographical or other constraints. Where allowed, uses and modifications accessory to boating facilities must minimize intrusion into the buffer, and any adverse impacts to ecological functions shall be minimized. (2.)			X	X
	Applicants must demonstrate that there is a need for modification or enlargement due to increased or changed use or demand, safety concerns, or inadequate depth of water. Enlarged portions of existing boating facilities must comply with applicable standards for new facilities. (4.)	X	X	X	X
Boating Facilities – Boat Launches	Applicants must demonstrate that the size proposed is the minimum necessary to allow the use proposed. (2.)	X			X
	Non-motorized boat launches shall use clean gravel or other	X			X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
(7.2.3)(C.)	permeable material. (3.)				
	Public boat launches shall include adequate restroom and sewage and solid waste disposal facilities in compliance with applicable health regulations. (4.)(a.)	X	X	X	X
	Overwater development in association with public boat launch facility may only be permitted where such use requires direct water access and/or where such facilities will increase public opportunities for water access. (4.)(b.)	X			X
	Public boat launch sites shall include parking spaces for boat trailers commensurate with projected demand, but such parking facilities shall be located outside of applicable shoreline buffers and, when feasible, outside of shoreline jurisdiction. (4.)(d.)	X	X	X	X
Boating Facilities – Docks (7.2.3)(D.)	New dock construction, excluding docks accessory to single-family residences, shall be permitted only when the applicant has demonstrated that a specific need exists to support the intended primary water-dependent use. The applicant shall demonstrate need by providing a needs analysis or comprehensive master plan. (1.)	X	X	X	X
Boating Facilities – Covered Moorage (7.2.3)(E.)	Covered moorage is only permitted within a marina or as a necessary component of a water-dependent industrial or commercial use. (1.)	X	X	X	X
	Covered moorage shall be designed and located to minimize adverse impacts caused by shading the water and blocking views, and shall be the minimum size necessary to support the water-dependent use. (3.)	X	X	X	X
Boating Facilities – Marinas (7.2.3)(F.)	Marinas shall be located, designed, constructed, and operated to meet the criteria of no-net-loss of ecological function and the preferred mitigation sequence of the SMP. (1.)	X	X	X	X
	New marinas or expansion of existing marinas shall be equipped with vessel pump-out facilities and shall provide on-shore sewage and waste disposal facilities. Marinas shall display visible signs stating that discharge of wastes to the water is prohibited. (2.)		X		
	Where a marina includes gas and oil handling facilities, such facilities shall be separate from main centers of activity in order to minimize fire and water pollution hazards. These marinas shall have adequate facilities and procedures for fuel handling and storage and the containment, recovery, and mitigation of spilled petroleum, sewage, and other potentially harmful or hazardous materials. (5.)		X		

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Residential Moorage and Launch Facilities: Docks, Buoys, and Marine Railways	Applicant shall demonstrate that a mooring buoy is not feasible to provide moorage. (B.)	X	X	X	X
	When feasible, new residential development of two or more dwellings with new accessory docks shall provide joint use or community dock facilities to reduce ecological impacts of new overwater facilities. (C.)	X	X	X	X
	All new or expanded private moorage and launch structures shall meet the general requirements for boating facilities found in Section 7.2.3(B.) of the SMP. (D.)	X	X	X	X
	Docks shall be the minimum length required; shall minimize water cover; and shall use decking that is grated or clear translucent material. Floats shall not ground out. Pile spacing shall be maximum feasible and pile diameter shall be minimized. New or expanded covered moorage is prohibited. (F.)		X		X
	Unavoidable impacts from new or expanded private boat moorage or launch construction shall be minimized and mitigated consistent with the requirements of the SMP. (G.)	X	X	X	X
	Private boat ramps are prohibited. Marine railways are allowed, provided they are designed and constructed using methods/technology that have been recognized and approved by state and federal resource agencies as the best currently available. (E.)	X	X	X	X
	Moorage or launch structures shall not be allowed in critical freshwater aquatic habitats unless it can be established that the structure, including auxiliary impacts and established mitigation measures, will not be detrimental to the natural habitat or species of concern and will not result in loss of ecological function. (H.)	X	X	X	X

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

5.3.2 Shoreline Stabilization

Shoreline stabilization measures have potentially significant impacts on sediment transport processes and floodplain connectivity. A listing of potential impacts from shoreline stabilization is provided below in Table 5-11.

Permits for bank stabilization were issued infrequently from 2001; however substantial areas of existing bank stabilization are present throughout shoreline jurisdiction. Key regulations in the proposed SMP that address potential impacts

from shoreline stabilization are listed below in Table 5-12. Under the proposed SMP, new or expanded shoreline stabilization measures would be expected to be permitted relatively infrequently, while repair and replacement of existing structures would be expected to occur more commonly. The proposed SMP substantially limits the development of new shoreline stabilization structures by establishing strict permitting criteria. The proposed SMP further ensures that new and replacement structures evaluate and implement the stabilization approach with the least potential for impacts to shoreline functions. Finally, any new or replacement structure must ensure that no net loss of functions is achieved.

Table 5-11. 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 5-12. Summary of key shoreline stabilization regulations that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Shoreline Stabilization (7.3.2)	Compliance with the following criteria shall be documented through geotechnical analysis, which addresses the necessity for shoreline stabilization by estimating timeframes and rates of erosion and reports on the urgency of the specific situation: 1. Proposals for new shoreline stabilization shall demonstrate that proposed structures are the minimum size necessary, and comply with mitigation sequencing; 2. New lots shall demonstrate that new shoreline stabilization will not be necessary in order for reasonable development to occur; 3. Development on steep slopes shall be set back sufficiently to ensure that shoreline stabilization is unlikely to be necessary during the life of the structure; 4. Development that would require new shoreline stabilization that would cause significant impacts to adjacent or down-current properties and shoreline areas shall not be allowed; 5. Hard armoring solutions shall be authorized only under specified circumstances. (B.)	X		X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	Shall be designed and constructed to avoid or minimize stream channel direction modification, realignment, and straightening; increased channelization of normal stream flows; or impacts to sediment transport. (C.)	X			
	New shoreline stabilization shall follow this hierarchy of preference: 1. No action; 2. Non-structural methods such as increased building setbacks, relocating structures, and/or other methods to avoid the need of stabilization; 3. Soft-shore stabilization; 4. Soft-shore stabilization in combination with rigid works; 5. Rigid works. (D.)	X		X	X
	New structural shoreline stabilization measures to protect an existing primary structure, including residences, are only allowed when there is conclusive evidence documented by a geotechnical analysis that the structure is in danger from shoreline erosion caused by currents or waves rather than from upland conditions. The analysis should evaluate on-site drainage issues and address drainage problems away from the shoreline edge before considering structural shoreline stabilization. Any new or expanded erosion control structures shall not result in a net loss of shoreline ecological functions. (E.)	X		X	X
	New shoreline structural stabilization may be permitted in support of a water-dependent development when: 1. The erosion is not being caused by upland conditions, such as the loss of vegetation and drainage; 2. There is a need to protect primary structures from damage due to erosion; 3. Non-structural measures are not feasible or not sufficient; and 4. The stabilization structure will not result in a net loss of shoreline ecological functions. (F.)	X	X	X	X
	New structural shoreline stabilization measures may be permitted in support of a new non-water-dependent development when all of the following are demonstrated in a geotechnical assessment or report by a qualified professional: 1. The erosion is not being caused by upland conditions, such as the loss of vegetation and drainage; 2. There is a need to protect primary structures from damage due to erosion; 3. Non-structural measures are not feasible or not sufficient; and 4. The stabilization structure will not result in a net loss of shoreline ecological functions. (G.)	X	X	X	X
	Shoreline protection for the restoration of ecological functions or hazardous substance remediation projects shall meet the conditions below: 1. Non-structural measures, planting vegetation, or installing on-site drainage improvements are not feasible or not sufficient; 2. The stabilization structure will not result in a net loss of shoreline ecological functions. (H.)	X	X	X	X
	The construction of a shoreline stabilization structure, either	X	X	X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	“soft” or “hard,” for the primary purpose of creating dry land is prohibited. (I.)				
	Major repair of hard structural shoreline stabilization shall be regulated as replacement. (J.)	X	X	X	X
	Replacement of an existing shoreline stabilization structure with a similar structure is permitted if there is a demonstrated need to protect existing primary uses or structures from erosion caused by current or wave action. Replacement walls or bulkheads shall not encroach waterward of the OHWM or existing structure unless the residence was occupied prior to Jan 1, 1992, and there are overriding safety or environmental concerns. In such cases, the replacement structure shall abut the existing shoreline stabilization structure. Soft shoreline stabilization measures that provide restoration of shoreline ecological functions may be permitted waterward of the OHWM. Replacement must result in no net loss of ecological functions. (K.)	X	X	X	X
	Bioengineered projects shall be designed in accordance with best available science and incorporate native plants, unless infeasible. (N.)	X		X	X

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

5.3.3 Breakwaters, Jetties, Groins, and Instream Structures

Breakwaters, jetties and groins are usually intended to alter currents or to deflect or dissipate wave energy. Instream structures, including dams and water diversions, have similar impacts, except that they may also alter water levels. All such structures have the potential to cause unintended impacts on natural bank erosion, sediment transport processes, and habitat. Potential impacts from these structures are summarized below in Table 5-13.

Based on past permit trends, as well as proposed SMP standards (Table 5-14), few, if any, new breakwaters, jetties, groins, or instream structures should be anticipated. Where new structures are permitted, they would need to demonstrate no net loss on an individual project basis. Infrequent repair and replacement of existing structures may be expected, and mitigation sequencing would apply for these structures.

Table 5-13. Summary of potential impacts from breakwaters, jetties, groins, and instream structures.

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

Table 5-14. Summary of key regulations related to breakwaters, jetties, groins, and instream structures that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Breakwaters, Jetties, Weirs, and Groins (7.3.3)	Breakwaters, jetties, groins, and weirs located waterward of the OHWM shall be allowed only where necessary to support water-dependent uses, public access, shoreline stabilization, or other specific public purpose. (A.)	X			X
	Require a shoreline conditional use permit, except for those structures installed to protect or restore ecological functions, such as woody debris installed in streams. (B.)	X			X
	Shall be designed to protect critical areas and shall provide for mitigation according to the sequence defined in the SMP. (C.)	X			X
	Open-pile or floating breakwaters shall be used unless it can be demonstrated that riprap or other solid construction would not result in any greater net impacts to shoreline ecological functions, processes, fish passage, or shore features. (D.)	X			X
In-stream Structures (7.2.8)	Permitted when the proposed activity will not increase the permanent footprint of the structure, and areas impacted by temporary construction are limited to the minimum area feasible and all disturbed areas will be returned to their pre-project or improved ecological condition. (A.)	X	X	X	X
	Applications for new or expanded in-stream structural uses shall include the following information prior to approval: 1. A hydraulic analysis of anticipated effects of the project on stream hydraulics; 2. A management plan prepared by a qualified professional that describes the anticipated effects of the project on fish and wildlife resources, shoreline critical areas, and cultural resources, provisions for protecting in-stream resources during construction and operation, and measures to compensate for impacts to resources that cannot be avoided. (C.)	X	X	X	X

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

5.3.4 Flood Hazard Management Structures

Potential impacts from flood hazard management are summarized below in Table 5-15. Substantial flood hazard management measures are in place throughout Cowlitz County. The proposed SMP provisions balance maintaining flood protection with protecting ecological functions. Key regulations in the proposed SMP that address potential flood hazard management impacts are listed below in Table 5-16.

Table 5-15. Summary of potential impacts from flood hazard management structures.

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

Table 5-16. Summary of key regulations related to flood hazard management structures that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
In-Stream Structures: Flood Control Works (7.2.8)(D.)	New or expanded structural flood works shall be permitted only when it can be demonstrated by a scientific and engineering analysis that all of the following measures can be met: a. They are necessary to protect existing development; b. Non-structural flood hazard reduction measures are infeasible; c. Impacts to ecological processes and functions, and priority fish and wildlife species and habitats, can be successfully mitigated; and d. Appropriate vegetation conservation actions are undertaken. (2.)			X	X
	Dike and levee design shall, to the maximum extent feasible, be: a. Limited in size to the minimum height necessary; b. Placed landward of associated wetlands and designated vegetation conservation areas, except for actions that increase ecological functions, unless there is no other feasible alternative to reduce flood hazard to existing development, as determined by a geotechnical analysis; c. Located and designed so as to protect and restore the natural character of the stream, avoid the disruption of channel integrity and provide the maximum	X		X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	opportunity for natural floodway functions to take place; d. Planted with appropriate vegetation meeting any permit or certification requirements while providing the greatest amount of ecological function possible. (4.)				

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

5.3.5 Clearing and Grading

Clearing and grading are commonly associated with most development projects. Potential impacts from clearing and grading are summarized below in Table 5-17. Key regulations in the proposed SMP that address potential impacts from clearing and grading are listed below in Table 5-18.

Table 5-17. Summary of potential impacts from clearing and grading.

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 5-18. Summary of key regulations related to clearing and grading that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Fill and Excavation (7.3.5)	Fill may be placed in flood hazard areas only when otherwise allowed by Critical Areas regulations and where it is demonstrated that adverse impacts to hydrogeologic processes will be avoided. (A.)	X			X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	Fill may be placed below the ordinary high water mark only when it is demonstrated that the fill is necessary to: support a habitat restoration, mitigation, or enhancement project; correct disruptions to natural stream and habitat conditions from past shoreline modifications; support a water-dependent use or public access proposal; support cleanup of contaminated sediments; or support transportation facilities of statewide significance only when demonstrated that alternatives to fill are not feasible. (B.)	X	X	X	X
	Fill is restricted in wetlands or Fish and Wildlife Habitat Conservation Areas in accordance with Critical Areas regulations. (D.)	X	X	X	X
	Excavation of previously deposited dredge materials above the ordinary high water mark may be permitted if part of a dredge materials management plan and not part of a beach nourishment or other shoreline restoration project. (F.)	X	X	X	X

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

5.3.6 Dredging and Dredge Material Disposal

Dredging can have significant effects on sediment transport, short-term effects on water quality, and by creating deep water, dredging can eliminate valuable shallow-water edge habitat. Potential impacts from dredging and dredge material disposal are summarized below in Table 5-19.

Landfill and dredging were among the most common shoreline modification permits issued from 2001-2011 (approximately two permits per year). Because the SMP establishes standards for new development to avoid the need for future maintenance dredging, most future dredging applications will be likely be related to maintenance dredging of previously dredged channels where habitat functions are already impacted. In Cowlitz County, dredging has occurred periodically in the Cowlitz River to maintain flood capacity of the river despite continued sedimentation effects of the debris flow from the Mount St. Helens eruption. On the Columbia River, dredging occurs to maintain navigation channels. Dredging for both of these purposes has resulted in substantial dredge disposal areas, which have reduced floodplain storage capacity and vegetative functions. Ongoing use of these sites under the proposed SMP is not likely to further degrade existing functions; however, eventual restoration of these sites also offers opportunities for improving habitat and floodplain functions. Key

regulations in the proposed SMP that address potential dredging and dredge material disposal impacts are listed below in Table 5-20.

Table 5-19. Summary of potential impacts from dredging and dredge material disposal.

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

Table 5-20. Summary of key regulations related to dredging and dredge material disposal that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Dredging and Dredge Material Disposal (7.3.6)	Shall be done in a manner which avoids or minimizes significant ecological impacts, and impacts which cannot be avoided shall be mitigated in a manner that assures no net loss of shoreline ecological functions. (A.)	X	X	X	X
	Shall be scheduled to minimize impacts to biological productivity (including, but not limited to, fish runs, spawning, and benthic productivity) and to minimize interference with fishing activities and other water-dependent uses. (J.)				X
Dredging (7.3.6)	Dredging shall be permitted only: 1. When establishing, expanding, maintaining, or reconfiguring navigation channels, anchorage areas, and basins in support of existing navigational uses; 2. When implementing an approved regional dredge management plan for flood control purposes; 3. As part of an ecological restoration and enhancement project benefitting water quality and/or fish and wildlife habitat; 4. As part of a Model Toxics Control Act (MTCA) or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) project; 5. As part of an approved underground utility installation; 6. In conjunction with new transportation, port, fish hatchery, or other water-dependent use for which there is documented public need and where other sites or methods are not feasible; and 7. When otherwise approved by state and federal agencies. (C.)	X	X	X	X
	New development shall be sited and designed to avoid or, if avoidance is impossible, minimize the need for new and maintenance dredging. (D.)	X	X	X	X
	Maintenance dredging shall be restricted to previously authorized locations, depths, and widths. (E.)	X	X	X	X
	Dredging waterward of the ordinary high water mark for the primary purpose of obtaining fill material is allowed only when	X	X	X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	the material is necessary for the restoration of ecological functions. When allowed, disposal site must be located waterward of the ordinary high water mark. The project must either be associated with a MTCA or CERCLA habitat restoration project or, if approved through a shoreline conditional use permit, any other significant habitat enhancement project. (F.)				
Dredge Material Disposal (7.3.6)	Dredge materials exceeding the Ecology criteria for toxic sediments shall be disposed of according to state and federal law. Proof of proper disposal at an upland permitted facility may be required. (G.)		X		
	Disposal of dredge material within a river’s channel migration zone shall be discouraged. In the limited instances where it is allowed, disposal shall require a shoreline conditional use permit. Disposal within wetlands or a channel migration zone shall be allowed only when proposed as part of an ecological restoration project demonstrated to improve wildlife habitat, correct impacts from past shoreline modification, or create, rehabilitate, or enhance a beach. This provision is intended to address discharge into the flowing current of the river or in deep water within the channel where it does not substantially affect the geohydrologic character of the channel migration zone. (H.)	X			X
	Dredge material disposal or stockpiling must meet the following standards: 1. Demonstrated to not result in significant or ongoing adverse impacts to water quality, critical areas, flood holding capacity, natural hydrology, or significant plant communities; and improves wildlife habitat and benefits shoreline resources. (I.)	X	X	X	X

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

5.3.7 Agriculture and Forest Practices

In the proposed SMP, forest practices and agriculture are conditional uses in the Natural shoreline environment designation and permitted uses in all other shoreline environment designations. As described in Section 3 of this document, commercial forest practices comprise a significant percentage of active land use in the County, and these practices are expected to continue. The proposed SMP includes provisions to ensure sustainable harvest of timber situated within shoreline jurisdiction (SMP 7.2.5(C.)). The proposed SMP also includes

provisions intended to specifically address impacts from log storage activities (SMP Section 7.2.9).

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 (SMP 7.2.1(C.)). Recent trends in land use indicate a reduction in agricultural shoreline lands, and this trend is expected to continue. However, where new agricultural uses do occur in shoreline jurisdiction, the proposed SMP includes standards to ensure that new agriculture will not result in a net loss of ecological functions.

Potential impacts from agriculture and forest practices are summarized below in Table 5-21. Key regulations in the proposed SMP that address potential impacts from agriculture and forest practices are listed below in Table 5-22.

Table 5-21. Summary of potential impacts from agriculture and forest practices.

Functions	Potential Impacts to Functions
Hydrologic	Agricultural irrigation from wells may affect ground water.
	Direct irrigation withdrawals may affect base flows.
	Reduced infiltration associated with forestry actions resulting in flashier hydrology.
Water Quality	Increased erosion from removal of trees or tilling of soil.
	Potential for leachate, bark, and wood debris to enter waterbodies through runoff from log storage areas.
	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 5-22. Summary of key agriculture and forest practice regulations that protect ecological functions.

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Agriculture (7.2.1)	The use of tanks and troughs for animal watering is encouraged; allowing animals direct access to surface water is not permitted. If stream crossings are necessary, bridges, culverts, or ramps shall be used to enable animal crossings without damaging the streambed or banks and must conform	X	X	X	X

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	to the requirements of the SMP. (C.)(1.)				
	Surface water drainage and runoff shall be diverted away from animal confinement and waste storage sites. (C.)(2.)		X		
	Animal confinement areas shall be graded to slope away from surface water. (C.)(3.)		X		
	Gutters and downspouts shall be installed on roofs to prevent excess water from entering animal confinement areas. The roof water shall be managed consistent with current stormwater standards. (C.)(4.)		X		
	Wetlands and fish and wildlife habitat conservation areas and their buffers shall not be used as animal containment sites. (C.)(5.)	X	X	X	X
	Confinement lots, feeding operations, lot wastes, stockpiles of manure solids, manure lagoons, and storage of noxious chemicals are prohibited in shoreline jurisdiction. (C.)(6.)		X		X
Forest Practices (7.2.5)	On shorelands adjacent to Shoreline of Statewide Significance, selective cutting shall be used and only 30 percent of the merchantable trees may be harvested in any 10-year period, provided that: 1) Other timber harvesting methods may be permitted as a conditional use in those limited instances where the topography, soil conditions, or silviculture practices necessary for regeneration render selective logging ecologically detrimental; and 2) Clear cutting of timber which is solely incidental to the preparation of land for other uses authorized by the SMP may be permitted as a conditional use. (C.)			X	X
	Preparatory work associated with the conversion of land to non-forestry uses and/or developments shall be reviewed in accordance with the provisions for the proposed non-forestry use and the general provisions of the SMP, including vegetation conservation. (D.)	X	X	X	X
Log Storage (7.2.9)	Log storage in the Aquatic environment designation shall be permitted only when water quality standards can be met, grounding will not occur, and fish and wildlife habitat conservation areas can be avoided. (A.)	X	X	X	X
	Log storage facilities upland and waterward of the OHWM shall be sited to avoid and minimize the need for dredging in order to accommodate new barging and shall be located in existing developed areas to the greatest extent feasible. If a new log storage facility is proposed along an undeveloped shoreline, an alternatives analysis shall demonstrate that it is not feasible to locate the facility within an existing developed area. (C.)	X	X		X

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	A debris management plan describing the removal and disposal of wood waste must be approved by the County. Debris monitoring reports shall be provided, where stipulated. Positive control, collection, treatment, and disposal methods for keeping leachate, bark, and wood debris out of surface water and groundwater shall be employed. In the event that bark or wood debris accidentally enters the water, it shall be immediately removed. Surface runoff from log storage areas shall be collected and discharged at only one point, if feasible. (D.)		X		
	Upland log storage areas shall meet the following requirements: 1. Log storage areas underlain by permeable soils shall be separated from the highest seasonal water table by at least 4 feet in order to reduce waste buildup and impacts on groundwater and surface water; 2. Stormwater shall be managed according to the latest version of the County’s Stormwater Manual; 3. Best management practices should be utilized to prevent loss of wood debris into the water. (E.)		X		
	New or expanded log storage development shall meet the criteria of no net loss of ecological functions and the preferred mitigation sequence of the SMP. (F.)	X	X	X	X

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

5.3.8 Aquaculture

Aquaculture uses in the County are primarily State-run fish hatchery facilities. Potential impacts from aquaculture are summarized below in Table 5-23. Although significant new aquaculture facilities are not anticipated, modifications to existing facilities could be expected in future years. Key regulations in the proposed SMP that address potential aquaculture impacts are listed below in Table 5-24.

Table 5-23. 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 water quality from substrate modification, supplemental feeding practices, pesticides, herbicides, and antibiotic applications.
Vegetative/ Habitat	Accidental introduction of non-native species or potential interactions between wild and artificially produced species.

Table 5-24. Summary of key aquaculture regulations that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Aquaculture (7.2.2)	Aquaculture undertaken for conservation or habitat restoration purposes is a preferred use. Allowed fisheries enhancement uses include hatcheries, rearing ponds, spawning channels, water diversion structures, and groundwater wells, provided that their construction does not result in a net loss of ecological function. (A.)				X
	No aquatic species shall be introduced into Cowlitz County's waters without prior written approval of the appropriate state agency for the species proposed for introduction. (B.)				X
	Consistent with mitigation sequencing, aquaculture uses and developments shall meet the no net loss criteria of the SMP. (D.)	X	X	X	X
	Site preparation and construction in the vicinity of aquaculture operations shall not result in off-site erosion, siltation, or other reductions in water quality. (E.)		X		
	Aquaculture structures and activities that do not require a waterside location must be located landward of the shoreline buffers required by the SMP. (G.)		X	X	X

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

5.3.9 Commercial, Industrial, and Institutional Development

Potential impacts from commercial, institutional, and industrial development are summarized below in Table 5-25. Shoreline designation standards in the proposed SMP limit where and what type of commercial, institutional, and industrial development may occur. These standards help avoid potential use conflicts and generally locate high intensity development in shoreline areas with higher levels of existing alterations.

Based on past permit data (Section 4.2), new commercial, institutional, and industrial uses are anticipated to occur occasionally (1-2 per year) within shoreline jurisdiction. Key regulations in the proposed SMP that address potential impacts from this type of development are listed below in Table 5-26. Specific standards for shoreline modifications also apply to commercial, institutional, and industrial development, including clearing and grading, boat and vessel facilities, dredging and dredge material disposal, among others.

A more in-depth review of the potential cumulative impacts of commercial and industrial development is provided in Section 7.2, Commercial, Port, and Industrial Uses.

Table 5-25. Summary of potential impacts from commercial, industrial, 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 5-26. Summary of key regulations related to commercial, industrial, and institutional development that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Commercial (7.2.4)	New or expanded non-water-oriented commercial development may be allowed only when: 1) It is part of a mixed-use project including water-dependent uses and provides public access and/or ecological restoration; 2) Navigability is severely limited at the site and the development provides public access and/or ecological restoration; or 3) The site is physically separated from the shoreline by another property or public right-of-way, or water-oriented development is infeasible due to lot size, topography, critical areas, or some other similar circumstances. (C.)	X	X	X	X
	An applicant for a new commercial use or development shall demonstrate that there will be no net loss of shoreline ecological function due to the use or development, and the use or development will have no significant adverse impacts to other shoreline resources or other shoreline uses. (D.)	X	X	X	X
	Accessory development or uses that do not require a shoreline location shall be located outside of the shoreline jurisdiction where feasible. (E.)	X	X	X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	Over-water structures, or other structures waterward of the ordinary high water mark, are allowed only for those portions of uses that require over-water facilities or public access and when allowed within the adjacent upland SED. Design shall not interfere with normal stream geomorphic processes or require additional future shoreline stabilization. (F.)	X			
	Shall meet the criteria of no net loss of ecological functions and the preferred mitigation sequence of the SMP. (H.)	X	X	X	X
	Only water-dependent elements of a proposal may encroach on required buffers. (I.)			X	X
Industrial (7.2.6)	Nonwater-oriented industrial development may only be allowed in shoreline jurisdiction if the use provides a significant public benefit such as providing public access and/or ecological restoration. (D.)	X	X	X	X
	Waterward expansion of existing non-water-oriented industrial development shall conform to the buffer and setback provisions of this chapter. If the existing non-water-oriented industrial use does not conform to these provisions, the structure can still be expanded but only on the landward sides of the structure. (E.)	X	X	X	X
	Proposed developments shall maximize the use of existing industrial facilities and avoid duplication of dock or pier facilities. Proposals for new industrial and port developments shall demonstrate the need for expansion into an undeveloped area. Only water-dependent elements of a proposal may encroach on required vegetated buffers. (F.)	X	X	X	X
	Siting of accessory development or use within shoreline jurisdiction shall be limited to facilities required to serve approved water-oriented uses. (G.)	X	X	X	X
	Overwater structures, or other structures waterward of the OHWM, are allowed only for those portions of water-dependent industrial uses that require overwater facilities as an essential feature of their function and when allowed within the adjacent upland SED. Design of overwater structures or structures beyond the OHWM shall demonstrate that they will not interfere with normal stream geomorphic processes, require additional future shoreline stabilization, or interfere with navigation or normal public use of the water. (I.)	X	X	X	X
Institutional (7.2.7)	Non-water-oriented institutional uses may be permitted provided that a significant public benefit, such as public access and/or ecological restoration, is provided. (B.)	X	X	X	X
	Loading, service areas, and other accessory uses shall be located landward of a primary structure or underground whenever possible but shall in no case be waterward of the	X	X	X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	structure. (C.)				
	New or expanded institutional development shall meet the criteria of no net loss of ecological function and the preferred mitigation sequence of the SMP. (D.)	X	X	X	X

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

5.3.10 Mining

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

In Cowlitz County, mining activity in shoreline jurisdiction currently includes surface re-mining of dredge deposits. This activity is expected to continue. In the proposed SMP, mining is identified as a permitted use in the High-intensity and Rural Conservancy environment designations, and as a conditional use in the Recreation environment designation. It is a prohibited use in the Residential, Natural, and Urban Conservancy environment designations. The proposed SMP encourages siting of mining activities to result in no net loss of shoreline ecological functions after final reclamation of the site, and gives preference to mining proposals that result in the creation, restoration, or enhancement of habitat for priority species. Key regulations in the proposed SMP that address potential mining impacts are listed below in Table 5-28.

Table 5-27. Summary of potential impacts from mining.

Functions	Potential Impacts to Functions
Hydrologic	Alteration in hydrologic and sediment processes potentially leading to erosion, channel incision, head cutting, and/or channelization of a river upstream or downstream from the mining location.
	Loss of floodplain habitat associated with armoring and levees to isolate pits from the river channel (Rivers).
Water Quality	Reduction in water quality from turbidity and dredge material disposal.

Functions	Potential Impacts to Functions
Vegetative/ Habitat	Disruption of benthic community.
	Simplification of in-channel habitats (Rivers/Streams).
	Potential to strand fish during pit capture events (Rivers).

Table 5-28. Summary of key regulations related to mining that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Mining (7.2.10)	Shall demonstrate that the proposed activities are dependent on a shoreline location consistent with the applicable SED. Non-water-dependent mining activities are prohibited within shoreline jurisdiction. (B.)	X	X	X	X
	Shall be designed and operated to result in no net loss of shoreline ecological functions and processes. To be approved, must demonstrate no adverse impact to the structural integrity of the shoreline that would change existing aquatic habitat or flow characteristics; and no changes in hydraulic processes to or from adjacent waterbodies that would damage aquatic habitat, shoreline habitat, or groundwater. (C.)	X	X	X	X
	Mining waterward of the ordinary high water mark may be permitted only when demonstrated that: 1. Removal of sand and gravel or other materials will not adversely affect natural gravel transport or other stream processes; 2. Proposed activities will not have significant adverse impacts on habitat for priority species and will not cause a net loss of shoreline ecological functions. (D.)	X	X	X	X
	After completion of mining activities: 1. All proposed subsequent use of mined property shall be consistent with the applicable SED and reclamation of disturbed areas shall provide for ecological functions consistent with the surroundings; 4. Backfill materials used in site reclamation shall be natural materials; 5. Reclamation shall prevent future erosion and sedimentation. Topography of the site shall be restored to contours compatible with surrounding shoreline area; 6. Final topography of the site shall not cause standing water to collect and remain on the site except as part of a sedimentation collection and removal system; and 7. All exposed areas shall be revegetated with self-sustaining plants suitable to the immediate shoreline environment. (F.)	X	X	X	X

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

5.3.11 Recreational Development

Cowlitz County’s shorelines offer a variety of recreational opportunities, both formal and informal. The potential impacts of recreational uses generally depend on the type and intensity of the use. Active uses, which may require structural development such as boat ramps, boardwalks, and concession facilities, are expected to have a greater impact than passive uses, such as hiking trails. Potential impacts from recreational development are summarized below in Table 5-29.

Gradual development of additional passive and active recreational is anticipated in the County. The Cowlitz County Comprehensive Park Plan Update (Cowlitz County PRAB 2010) identifies several specific recreational development projects on County shorelines, including projects at Willows Grove Park, Harry Gardner Park, Silver Lake, and Coal Creek Slough. Additionally, the Draft Recreation Resource Management Plan for the Lewis River Hydroelectric Projects (EDAW, Inc. & PacifiCorp 2004) includes many recreational projects on County shorelines, including new trails, boat launch improvements, ADA accessibility projects, campground upgrades, and more. Most active uses would require a conditional use permit and would need to demonstrate no net loss on an individual project basis. Trails are permitted in most environment designations. Key regulations in the proposed SMP that address potential impacts from recreational development are listed below in Table 5-30.

Table 5-29. Summary of potential impacts from recreational development.

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).
	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 5-30. Summary of key regulations related to recreational development that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Recreational (7.2.11)	Only water-oriented elements of a recreational proposal may encroach on required vegetated buffers, except as outlined in the Critical Areas Regulations. (C.)			X	X
	Shall be located, designed, and operated in a manner consistent with the purpose of the environment designation in which it is located, and shall meet the criterion of no net loss of ecological functions and the preferred mitigation sequence of the SMP. (D.)	X	X	X	X
	Parking areas shall be located outside of shoreline jurisdiction, unless infeasible, in which case parking facilities shall be sited as far from the immediate shoreline as feasible. Applicants shall demonstrate the need for the proposed location. (E.)	X	X	X	X
	Design of parking areas shall comply with all applicable County and State stormwater regulations. (F.)		X		
	All permanent, substantial structures shall be located outside officially mapped floodways. Minor accessory uses may be allowed in the floodway when it can be demonstrated that there will be no net loss of ecological functions and when they comply with the flood hazard criteria of the SMP. (G.)	X			X
	New overwater structures for recreation use shall be allowed only when they accommodate water-dependent recreation use or facilities; or they provide access for the public; and no net loss of ecological functions will be achieved. (I.)	X			X

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

5.3.12 Residential Development

Table 5-31 below describes the potential impacts of residential development. Single family residential development is likely to occur throughout most areas of shoreline jurisdiction in the foreseeable future.

Table 5-32 lists SMP provisions that help ensure that potential impacts are avoided, minimized, or mitigated. Many shoreline modifications may be considered accessory to residential development; however, such modifications are not addressed in this subsection, but are addressed in other subsections of this document (e.g. shoreline stabilization).

A more in-depth review of the potential cumulative impacts of residential development is provided in Section 7.1, Residential Development.

Table 5-31. 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 5-32. Summary of key regulations related to residential development that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Residential (7.2.12)	Shall be a priority use when designed and developed to create no net loss of ecological functions. (A.)	X	X	X	X
	New residential development shall comply with the shoreline buffer provisions established in Table 7-2 of the SMP and the Critical Areas Regulations. Redevelopment or expansion of nonconforming residential structures shall also conform to the provisions for nonconforming development in the SMP. (B.)	X	X	X	X
	New residential construction shall: 1. Be designed such that no new shoreline stabilization measures are necessary; 2. On steep slopes or bluffs, 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; 4. Be prohibited in, over, or floating on the water; 5. Be prohibited in floodways and channel migration zones, including associated sewage disposal systems. (C.)	X	X	X	X
	Residential structures and associated appurtenances shall be located outside setbacks, critical areas, and buffers unless otherwise allowed by the SMP. (D.)	X	X	X	X
	New lots shall be configured such that structural flood hazard	X		X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	reduction and shoreline stabilization measures will not be required in order for reasonable development to occur using geotechnical analysis of the site and shoreline characteristics. (E.)				
	New lots shall be configured such that siting and construction are feasible while achieving no net loss of ecological functions. (F.)	X	X	X	X
	No fence or landscape wall shall be placed waterward of the OHWM or closer to the water than the landward edge of the required setback line. (I.)	X			X

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

5.3.13 Transportation Facilities and Parking

Roads, railroads, and parking areas are common features along the County’s shorelines. Roads, railroads, parking areas, and associated traffic tend to impair habitat and hydrologic connectivity, and stormwater runoff can have a substantial impact on water quality conditions (Table 5-33).

Proposed SMP standards require that new primary roads, as well as parking areas, are constructed outside of shoreline jurisdiction where feasible (Table 5-34). As such, with the exception of driveways and access roads for new residential development, new roads are not anticipated in shoreline jurisdiction.

Table 5-33. Summary of potential impacts from transportation facilities.

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 5-34. Summary of key transportation facility regulations that protect ecological functions.

Location in SMP	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Transportation and Parking (7.2.13)	Facility lighting shall be directed away from critical areas and adjacent waterbodies, unless necessary for public health and safety. (D.)				X
Transportation and Parking: Roads, Railroads and Bridges (7.2.13(A.))	New or expanded roads or railroads not related to and necessary for the support of existing or planned authorized uses in the shoreline jurisdiction shall demonstrate the need for a shoreline location and that no feasible upland alternative outside the shoreline is available. Where location outside of shoreline jurisdiction is not possible, facilities shall comply with the buffers identified in the SMP and be set back from the OHWM a distance sufficient to make shoreline stabilization unnecessary. (1.)	X	X		X
	New or expanded facilities must be demonstrated to: a. Minimize impacts to critical areas and associated buffers and minimize alterations to the natural or existing topography to the extent feasible; b. Avoid or minimize the need for shoreline stabilization; and c. Comply with the mitigation sequencing provisions of the SMP. (2.)	X	X	X	X
	New crossings over streams shall be avoided, but where necessary shall utilize bridges rather than culverts to the extent feasible. (3).	X			X
	Requirements for bridge and culvert installation crossing all streams shall be consistent with flow-, debris-, and/or fish-passage requirements in WDFW's site-specific Hydraulic Project Approval. (4.)	X	X		X
	All excavation materials and soils exposed to erosion by all phases of road, railroad, bridge, and culvert work shall be stabilized and protected by seeding and mulching both during and after construction. (5.)	X	X	X	
	Private access roads or driveways for individual single-family residences or lots shall be limited to the minimum width allowed by the fire code. (6.)	X	X	X	X
	Bridges shall provide the maximum length of clear spans feasible with pier supports to produce the minimum amount of deflection feasible. (7.)	X			
Transportation and Parking: Non-Motorized Facilities (7.2.13(B.))	Shall be located outside of critical areas and their associated buffers. With demonstration that the trail cannot be located outside of the buffer, the trail may be located in the outer 25 percent of the buffer. (2.)	X	X	X	X
	Non-motorized facilities constructed for water enjoyment and water access are encouraged; any impacts to ecological functions shall be avoided, minimized, and mitigated. (4.)	X	X	X	X

Location in SMP	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	Elevated walkways shall be utilized where feasible to cross wetlands and streams if a trail is not feasible outside of the critical area and associated buffer. (3.)	X			X
Transportation and Parking: Parking. (7.2.13(C.))	Parking facilities allowed only as necessary to support an authorized use. Shall be located as far as possible from the ordinary high water mark and outside shoreline jurisdiction unless limited by lot size, topography, critical areas, or some other similar circumstances. (1.)	X	X	X	X
	Parking facilities shall be located on the landward side of the primary structure unless demonstrated to be infeasible. (2.)	X	X	X	X

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

5.3.14 Utilities

Potential impacts from utility infrastructure are summarized below in Table 5-35. Key regulations in the proposed SMP that address potential utility infrastructure impacts are listed below in Table 5-36.

Table 5-35. 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 5-36. Summary of key utility infrastructure regulations that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Utilities (7.2.14)	New or expanded non-water dependent utilities or parts of utilities that are not water-dependent may be located within shoreline jurisdiction only if: 1. No alternative location outside of shoreline jurisdiction is feasible based on an analysis of alternative locations and technologies; and 2. Utilization of existing corridors is not feasible, including expansion or replacement of existing facilities. These requirements do not apply to hydropower transmission lines that extend directly from the hydropower facility, which are considered water-dependent. (A.)	X	X	X	X
	Construction and operation of the facility shall result in no net loss of ecological functions. (B.)	X	X	X	X
	Overhead electrical transmission lines shall be located outside of shoreline jurisdictional areas unless infeasible due to site constraints, or must be located within an existing utility corridor. (C.)			X	X
	Transmission, distribution, and conveyance facilities shall be located in existing rights of way and corridors or shall cross shoreline jurisdictional areas by the shortest, most direct route feasible, which avoids significant environmental damage. (D.)		X	X	X
	Utility crossings of waterbodies shall be attached to bridges where feasible; otherwise, underground construction methods that avoid surface disturbance are preferred, unless such utilities are proposed within an existing corridor. (E.)	X	X	X	X
	All underwater pipelines transporting liquids intrinsically harmful to aquatic life or potentially harmful to water quality shall be equipped with automatic shut off valves. (F.)			X	X
	Structural utility buildings, such as pump stations, electrical substations, or other facilities, shall be located outside of shoreline jurisdiction, unless infeasible, in which case they shall be landscaped to provide compatibility with natural features and adjacent uses. (G.)	X	X	X	X
	Stormwater outfalls may be placed below the ordinary high water mark to reduce scouring. New outfalls and modifications to existing outfalls shall be designed and constructed to avoid impacts to existing native aquatic vegetation attached to or rooted in substrate to the extent feasible. (H.)	X	X		X
	The presence of existing utilities should not justify more intense development. (I.)	X	X	X	X

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

5.3.15 Shoreline Habitat and Ecological Enhancement Projects

Potential impacts from shoreline habitat and ecological enhancement projects are primarily related to construction, and would therefore be expected to be temporary. Potential impacts from shoreline habitat and ecological enhancement projects are summarized below in Table 5-37. Regulations in the proposed SMP are intended to minimize these impacts while ensuring that projects maximize benefits to shoreline ecological functions and are successful in the long-term. Key regulations that address potential impacts from shoreline habitat and ecological enhancement projects are summarized below in Table 5-38.

Table 5-37. Summary of potential impacts from shoreline habitat and ecological enhancement projects.

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

Table 5-38. Summary of key regulations related to shoreline habitat and ecological enhancement projects that protect ecological functions.

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Shoreline Habitat and Ecological Enhancement Projects (7.3.7)	Long-term maintenance and monitoring shall be included in restoration or enhancement projects. (A.)	X	X	X	X
	Shall be designed using scientific and technical information and implemented using best management practices. (B.)	X	X	X	X
	Shall demonstrate that: 1. Spawning, nesting, or breeding fish and wildlife habitat conservation areas will not be adversely affected; 2. Water quality will not be degraded; 3. Flood storage capacity will not be degraded; 4. Streamflow will not be reduced; and 5. Impacts to critical areas and buffers will be avoided, minimized, or mitigated. (C.)	X	X	X	X

Location in SMP	SMP Provisions Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	Restoration and enhancement projects that include shoreline modification actions or activities such as vegetation removal, shoreline stabilization, dredging, or filling shall demonstrate that the primary purpose of such modification activity is clearly restoration of the natural character and ecological functions of the shorelines; and shall demonstrate that the project addresses legitimate restoration needs and priorities. (D.)	X	X	X	X

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

5.3.16 General Shoreline Modification Regulations

In addition to the regulations addressing specific shoreline uses and modifications, the proposed SMP includes a few catch-all regulations that apply to all shoreline modifications (SMP Section 7.3.1). These regulations require that preference be given to those shoreline modifications with a lesser impact on ecological functions, and that shoreline modifications be designed to incorporate all feasible measures to protect ecological shoreline functions and ecosystem-wide processes. Structural modifications may only be permitted where they are demonstrated to be necessary to support or protect an allowed primary structure or a legally existing shoreline use, or for mitigation or enhancement purposes.

5.4 Shoreline Restoration Plan

As discussed in Chapter 1, one of the key objectives that the SMP must address is “no net loss of ecological shoreline functions necessary to sustain shoreline natural resources.” Although the implementation of restoration actions to restore historic functions is not required by SMP provisions, the guidelines state that “master programs shall include goals, policies and actions for restoration of impaired shoreline ecological functions. These master program provisions should be designed to achieve overall improvements in shoreline ecological functions over time, when compared to the status upon adoption of the master program” (WAC 173-26-201(2)(f)). Pursuant to that direction, the County prepared the Shoreline Restoration Plan (TWC 2013, updated 2016), which identifies opportunities for voluntary restoration, enhancement, and protection actions. The Shoreline Restoration Plan also includes mandated dam mitigation that will improve shoreline functions over the current baseline condition.

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

The County's Shoreline Restoration Plan identifies planned, site-specific, restoration projects, as well as ongoing and potential outreach and incentive programs to improve shoreline functions and processes. The Shoreline Restoration Plan also identifies several agencies and non-profit organizations that are active in restoration in Cowlitz County. Major Shoreline Restoration Plan components that will contribute to an improvement in ecological functions are summarized below:

- Site specific projects to restore ecological processes and eliminate barriers. Projects include, among others:
 - Restoring floodplain connectivity;
 - Restoring side-channel habitats;
 - Removing shoreline armoring;
 - Improving fish passage.
- Where existing systems are largely intact, the restoration plan focuses on protecting those intact processes and functions.
- Using programmatic approaches and teaming with key partners in education and outreach, as well as project implementation.
- Identifying funding sources to implement projects.

6 EFFECTS OF OTHER REGULATORY PROGRAMS

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

6.1 County Regulations and Programs

6.1.1 Cowlitz County Zoning Code

Chapter 18.10 of the Cowlitz County Code provides zoning standards that direct uses, building bulk, scale, and location, and other design considerations throughout the County.

6.1.2 Cowlitz County Stormwater Management

On February 16, 2007, Cowlitz County was issued a NPDES phase II Municipal Stormwater Permit. This permit requires the County to develop and implement a program to reduce stormwater runoff and pollution in unincorporated urban areas adjacent to the cities of Longview and Kelso. The Stormwater Management Plan (SWMP) was updated in 2012. Activities associated with the stormwater permit include outreach and education, public involvement, and illicit discharge detection and elimination (Cowlitz County 2013).

6.1.3 Floodplain Management

Floodplain Management regulations in CCC 16.25 prohibit new construction, substantial improvements, fill, and other development, including new or expanded residential development within floodways (CCC 16.25.080.L; CCC 16.25.090.A). The standards further prohibit development that threatens to: (1) adversely restrict, floodwaters in the floodway; (2) adversely affect the capacity of the floodway; or (3) increase water surface elevation or the location of the floodway (CCC 16.25.080.D). These provisions help ensure that development within the floodway will not limit floodway functions.

6.1.4 Six Year Transportation Improvement Program

The County's Six-Year Transportation Improvement Program (Cowlitz County 2012) includes plans to remove of the Abernathy Creek Bridge to improve salmon habitat. The project is funded by the Salmon Recovery Funding Board, and demolition was planned for 2013.

6.2 PacifiCorp Shoreline Management Plan

Much of the upper Lewis watershed is also owned, managed, and/or regulated by PacifiCorp. The PacifiCorp Lewis River Hydroelectric Projects Shoreline Management Plan (2008a) is analogous to a municipal shoreline master program. The plan identifies three shoreline classifications: Integrated Use, Project Works, and Resource Management. The majority of shoreline area is designated as Resource Management classification, in which docks, hard shoreline stabilization, and dredging are all prohibited.

6.3 State Agencies/Regulations

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

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

6.3.1 Washington Department of Natural Resources

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

6.3.2 Washington Department of Ecology

The Washington Department of Ecology may review and condition a variety of project types, including any project that needs a permit from the U.S. Army Corps of Engineers (see Section 6.4), any project that requires a shoreline conditional use permit or shoreline variance, and any project that disturbs more than 1 acre of land. Project types that may trigger Ecology involvement include pier and shoreline modification proposals and wetland or stream modification proposals, among others. Ecology's three primary goals are to: 1) prevent pollution, 2) clean up pollution, and 3) support sustainable communities and natural resources (Ecology 2013). Their authority comes from the State Shoreline Management Act, Section 401 of the Federal Clean Water Act, the Model Toxics Control Act, the Water Pollution Control Act, the Federal Coastal Zone Management Act of 1972, the State Environmental Policy Act, the Growth Management Act, and various RCWs and WACs of the State of Washington.

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

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

Under the Model Toxics Control Act, Ecology has the authority to oversee and manage the cleanup of contaminated sites. Within Cowlitz County shorelines, many toxic and hazardous sites have been identified. Cleanups are underway at several of these facilities, including the Reynolds Metals Aluminum Smelter on the Columbia River in the unincorporated area of the City of Longview's UGA.

6.3.3 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.

6.3.4 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 Washington State DNR and are not regulated under the SMA unless the land is being converted to another use besides growing trees or the commercial harvest is within 200 feet of a shoreline of statewide significance and exceeds the harvest limits established in the SMA. Conversions must comply with the provisions in the SMP for the new use.

6.3.5 Surface Mining Act

The Surface Mining Act is a reclamation law administered by WA DNR that requires a permit for each mine that: 1) results in more than 3 acres of mine-related disturbance, or 2) has a high-wall that is both higher than 30 feet and steeper than 45 degrees. The DNR is responsible for reviewing and approving site reclamation plans to achieve the following goals:

- Segmental or progressive reclamation;
- Preservation of the topsoil;
- Slope restoration such that high-walls are rounded in plan and section for all mines;
- Stable slopes;
- Final topography that generally comprises sinuous contours, chutes and buttresses, spurs, and rolling mounds and hills, all of which blend with adjacent topography to a reasonable extent; and
- Effective revegetation with native multi-species ground cover and trees depending on the municipality-approved subsequent use designated for the site.

6.4 Federal Agencies/Regulations

Federal regulations most pertinent to development in the County's shorelines include the Endangered Species Act, the Clean Water Act, and the Rivers and Harbors Appropriation Act. Other relevant federal laws include the National Environmental Policy Act, Anadromous Fish Conservation Act, Clean Air Act, and the Migratory Bird Treaty Act. A variety of agencies (e.g., U.S. Army Corps of Engineers [Corps], National Marine Fisheries Service, U.S. Fish and Wildlife Service) are involved in implementing these regulations, but review by these agencies of shoreline development in most cases would be triggered by in- or over-water work, or discharges of fill or pollutants into the water. Depending on the nature of the proposed development, federal regulations can play an important role in the design

and implementation of a shoreline project, ensuring that impacts to shoreline functions and values are avoided, minimized, and/or mitigated. A summary of some of the key federal regulations and/or agency responsibilities follows.

6.4.1 Clean Water Act, Section 404

Section 404 of the federal Clean Water Act provides the Corps, under the oversight of the U.S. Environmental Protection Agency, with authority to regulate discharge of dredged or fill material into waters of the United States, including wetlands (Environmental Protection Agency 2013). The extent of the Corps' authority and the definition of fill have been the subject of considerable legal activity. However, it generally means that the Corps must review and approve many activities in shoreline waterbodies, and other streams and wetlands. These activities may include wetland fills, stream and wetland restoration, and culvert installation or replacement, among others. Similar to Washington State Environmental Policy Act (SEPA) requirements, the Corps is interested in avoidance, minimization, restoration, and compensation of impacts.

6.4.2 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. Proposals to construct new or modify existing in-water structures (including piers, marinas, bulkheads, breakwaters), to excavate or fill, or to "alter or modify the course, location, condition, or capacity of" these navigable waterbodies must be reviewed and approved by the Corps.

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

7 SUMMARY POTENTIAL FOR CUMULATIVE IMPACTS

Using the information presented in previous chapters, this chapter zeroes in on the most probable types of development in the County, and synthesizes the information from Chapters 3 through 6 to assess anticipated cumulative impacts.

The most commonly anticipated changes in shoreline development involve residential, commercial, and industrial development. These activities include upland development, and may also include the development of overwater structures and/or shoreline stabilization. As directed by the WAC, the policies and regulations in the proposed SMP are designed to ensure that cumulative impacts do not result in a net loss of ecological functions.

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

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

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

7.1 Residential Development

As described in Chapter 4, residential development is expected to continue in County shorelines. Residential development is expected to occur as a combination of new development and redevelopment and/or expansion of existing structures. Single-family residential development is exempt; meaning that it does not require a shoreline substantial development permit. Yet exempt development must still be carried out in compliance with policies and standards of the SMP. The residential use and development of shoreline uplands, including accessory development such as utility and transportation infrastructure, generally involves impacts to shoreline ecological functions that result from the replacement of pervious, vegetated areas

with impervious surfaces and/or a landscape management regime that includes chemical treatments of lawn and landscaping.

The County's critical areas regulations apply within and outside of shoreline jurisdiction. These regulations are adopted by reference in the proposed SMP for application to shoreline areas, with certain modifications. The regulations establish shoreline buffers for wetlands based on habitat type and land use intensity, and shoreline buffers based on shoreline environment designation. The regulations allow for development within the outer quarter of designated shoreline buffers if a Level 1 Critical Areas Habitat Assessment demonstrates that there will not be a loss of functions (development may require mitigation depending on the findings of the Critical Areas Habitat Assessment). Development can further encroach into the inner three quarters of the buffer if a Level 2 Critical Areas Habitat Assessment is conducted. Under this scenario, a mitigation and monitoring plan is required. These standards provide significant flexibility to the applicant to develop within the standard buffer, and they rely on the strict implementation and enforcement of the standards by County planning staff in order to protect areas where development within the standard buffer would degrade shoreline functions. The WDFW reviewed how these standards have been implemented in the past, and concluded that, "While the existing riparian habitat area reduction provisions... may in theory allow for severe reductions in the areas around streams, rivers, and lakes, in practice such reductions are given due consideration of mitigation sequencing and maintenance of functions and values." Provided that similar judicious application of buffer reduction continues, the proposed buffer standards are expected to maintain the level of existing functions.

In addition to buffer standards, other SMP standards are essential to avoiding a loss of functions from residential development. These standards include stormwater standards consistent with the County's adopted stormwater plans, dock standards, and shoreline stabilization standards.

Based on past permitting trends that indicate a limited number of dock permits issued and the limited geographic area (primarily shoreline lakes) where new residential docks would be anticipated, residential docks are not expected to occur frequently in Cowlitz County shorelines in the foreseeable future. The SMP further limits the number of future docks by requiring shared docks for single family residential development where feasible, and for multifamily development and subdivided lots. Where docks are constructed, they will need to follow design, location, and construction standards that avoid, minimize, and mitigate for overwater and shoreline impacts. Standards for dock replacement are not explicitly addressed in the SMP. It is assumed that the replacement of existing docks would need to meet no net loss on an individual basis, but this analysis does not account for any improvement in function related to dock replacement.

Permit data from 2002 to 2012, presented in Chapter 4, indicates that only 5 shoreline stabilization permits were issued. The permit history may not account for shoreline stabilization related to residential uses, as these measures may have received permit exemptions. Nevertheless, given the proposed SMP standards that require documentation of a specific need for new bulkheads, as well as provisions that restrict new development that would have a future need for stabilization, new bulkhead permits are expected to be very rare in the County. Stabilization measures may be replaced with a similar structure, provided there is a need and that the replacement will not result in a loss of ecological functions. No improvement in function is anticipated related to the replacement of stabilization measures. The proposed SMP will also require mitigation for the short-term effects of construction, and the longer-term impacts relating to sediment supply and vegetation for both new and replacement bulkheads.

In addition to County oversight and permitting, the Corps and WDFW have jurisdiction over new dock and shoreline stabilization projects, and repairs or modifications to existing shoreline stabilization. As part of their efforts to minimize and compensate for dock and shoreline stabilization-related impacts, both agencies encourage implementation of native shoreline enhancement for new shoreline stabilization projects. Further, they also promote additional impact compensation measures for many shoreline armoring modification projects.

On a cumulative basis, despite site-specific mitigation requirements for docks and stabilization measures, the infrequent addition or expansion of docks or shoreline stabilization measures will likely result in some level of alteration of shoreline habitat and sediment transport processes. This incremental loss is expected to be offset by restoration actions underway and planned within the County.

Voluntary restoration projects planned for the near future and underway within the County will enhance channel complexity, ensuring that incremental impacts of residential shoreline stabilization and docks will not result in a net loss of functions on a cumulative basis. These projects include instream and off-channel restoration on the Lewis River at Eagle Island, restoration of the lower Kalama River, restoration of a bedrock section of the Coweeman River, and instream enhancement on the . Together, the SMP provisions guiding new shoreline docks and stabilization measures and the planned restoration projects are expected to result in a gradual improvement in instream complexity and sediment transport processes.

7.2 Commercial, Port, and Industrial Uses

From 2002 to 2012, commercial, port, and industrial uses were among the most frequently permitted uses in the County. The analysis of land use trends indicated that the area in commercial, port, and industrial uses has changed little over time. The most likely changes for commercial, port, and industrial uses include the

intensification of uses at a site. Commonly associated shoreline modifications may include maintenance dredging and overwater structures.

Commercial, port, and industrial uses typically have similar potential effects on shorelands and shoreline waterbodies. Primary impacts associated with upland commercial, port, and industrial development relate to a reduction in stormwater infiltration resulting from increased impervious surface coverage and an increase in potential for water quality degradation resulting from increased traffic and the use and storage of chemicals.

Shoreline designation standards in the proposed SMP, as well as County zoning standards, limit where and what type of commercial and industrial development may occur. These standards help avoid potential use conflicts and generally locate high intensity development in shoreline areas with higher levels of existing alterations.

In addition to siting areas of commercial, port, and industrial uses, the proposed SMP requires mitigation sequencing and limits the encroachment of water-dependent uses into the regulatory buffer to the minimum necessary. All non-water-dependent uses must be located outside of the buffer, and they must improve shoreline functions and provide public access if they are to be located in shoreline jurisdiction.

Most new commercial, port, and industrial developments in the unincorporated urbanized area adjacent to the cities of Longview and Kelso will be subject to the County's stormwater management regulations (CCC 16.22), which apply long-term stormwater management standards to development of one acre or more that disturbs at least 7,000 square feet of area. Additionally, in areas outside of the urbanized area adjacent to the cities of Longview and Kelso, an Industrial Stormwater General Permit is required of any industrial facilities discharging stormwater, and an NPDES permit is required for any industrial facility before discharging wastewater to state waters. These permits will require preparation of a stormwater prevention plan, implementation of best management practices, compliance Ecology's Stormwater Manual for Western Washington (Ecology 2005), and monitoring.

Dredging is allowed in the Aquatic environment designation to provide navigation or flood control; as part of a toxics cleanup project; as part of an approved underground utility installation; or in conjunction with a water-dependent use for which there is a documented public need. Mitigation sequencing and no net loss standards would apply where new or maintenance dredging would be expected to result in a loss of functions.

Standards for commercial and industrial piers require that applicants provide a needs analysis or comprehensive master plan projecting future needs for dock or moorage space, and that pier designs minimize potential effects on habitat. Mitigation sequencing will be required, and compensatory mitigation for any new pier is expected.

8 NET EFFECT ON ECOLOGICAL FUNCTION

This chapter pulls together all the elements of the SMP and previously discussed background information and analysis to summarize whether and how the SMP ensures no net loss of ecological functions. This chapter is also intended to help inform the County of potential future shoreline impacts, the importance of specific proposed SMP provisions, and potential gaps in the proposed SMP, which may allow for a loss of shoreline functions.

The proposed SMP is expected to maintain existing shoreline functions within Cowlitz County while accommodating the reasonably foreseeable future shoreline development. Other local, state and federal regulations, acting in concert with this SMP, will provide further assurances of maintaining shoreline ecological functions over time. The Shoreline Restoration Plan, and voluntary actions described therein, will help ensure that incremental losses that could occur despite SMP provisions do not result in a net loss of functions, and these restoration actions may result in a gradual improvement in shoreline functions.

As discussed above, major elements of the SMP that ensure no net loss of ecological functions fall into the following general categories: 1) Shoreline Environment designations (Section 5.4), 2) general policies and regulations (Section 5.5 and 6), and 3) shoreline use and modification provisions (Section 7). The Shoreline Restoration Plan identifies ongoing and planned voluntary restoration that will provide an opportunity to improve shoreline conditions over time.

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

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

The County's critical areas regulations apply within and outside of shoreline jurisdiction. These regulations are adopted by reference in the proposed SMP for application to shoreline areas. The County's critical areas regulations allow for development within Fish and Wildlife Habitat Conservation Area (and shoreline) buffers, provided that a habitat assessment is provided and any adverse impacts are mitigated. These standards provide significant flexibility in implementation of riparian buffers, and will rely on strict implementation and interpretation by County staff to ensure that no net loss is maintained. A review of past permitted projects related to critical areas in the County indicates a pattern of careful application of the reduction options (Appendix A). Provided that the same level of regulatory scrutiny continues in the County, the standards are consistent with the maintenance of no net loss of functions.

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

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

Given the above provisions of the SMP, including the key features listed above, implementation of the proposed SMP is anticipated to achieve **no net loss of ecological functions in the shorelines of Cowlitz 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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**APPENDIX A:
WDFW COMMENTS ON RIPARIAN
HABITAT AREA REDUCTION
PROVISIONS IN COWLITZ COUNTY
CRITICAL AREAS ORDINANCE (CAO)**



State of Washington
DEPARTMENT OF FISH AND WILDLIFE

Region 5 Office: 2108 SE Grand Blvd, Vancouver, WA 98661, (360) 696-6211, TTY (800) 833-6388
Main Office Location: Natural Resources Building - 1111 Washington Street SE - Olympia, WA

June 20, 2013

David Sherrard
Senior Project Manager/Environmental Planner
Parametrix
411 108th Avenue, Suite 1800
Bellevue, WA 98004-5571

RE: WDFW Comments on Riparian Habitat Area Reduction Provisions in Cowlitz County Critical Areas Ordinance (CAO)

Dear Mr. Sherrard:

Thank you for providing the Washington Department of Fish and Wildlife (WDFW) the opportunity to comment on the existing **Riparian Habitat Area Reduction Provisions in Cowlitz County Critical Areas Ordinance (CAO)**. This letter summarizes previous WDFW comments on the matter, and also presents the results of a brief audit of actual case studies to assess how the existing provisions are implemented in practice.

Key Point:

The existing riparian habitat area reduction provisions in CCC 19.15.130(E)(3)(f) may in theory allow for severe reductions in the areas around streams, rivers, and lakes. However, WDFW has observed that in practice such reductions are given due consideration of mitigation sequencing and maintenance of functions and values.

We therefore retract our previous comments and provide some alternate input which may help strengthen the CAO.

Background Information:

During review of the existing Critical Areas Ordinance as it was being written, WDFW submitted the following comment:

3.f Use of Riparian Habitat Areas:

The provision of buffer reductions of 50-75% with completion of a critical areas assessment will contribute to resource degradation and loss, which will be cumulative across the landscape as individual owners receive reductions. We strongly recommend that Cowlitz County remove this provision. Flexibility can be maintained, and more effective riparian protection achieved, if the County considers buffer reductions only where stream and riparian habitat functions are not adversely affected, and only when equivalent functions can and will be provided elsewhere on the subject property. Conceptually, this could be achieved with greater buffer protection elsewhere on the property, when and where a landowner or developer seeks a buffer reduction.

The response from Cowlitz County. As noted within the July 21, 2008 comment matrix, read:

Make no changes. As written, the provisions already require demonstration of no loss of functional value in order to receive reduction.

We revisited this topic in our comment letter of March 29, 2013:

Comment # 7j: Buffer reductions

CCC section 19.15.130(E)(3)(f) allows for activities within riparian habitat areas when activities are “reviewed through a critical areas assessment which demonstrates the activities will not impact the RHAs’ functions and values.” The assessment may include a mitigation plan to show maintenance of functions and values.

In theory, this would mean that riparian buffers are reduced and functions/values are maintained. The mechanism can allow for activities within the inner 25% of the RHA standard width. Considering this magnitude of potential reduction, in order to obtain a greater understanding of these options in practice, WDFW respectfully requests to review the twenty most recent project approvals issued by Cowlitz County involving riparian width reduction.

In response to this comment, Cowlitz County staff facilitated access to project files for WDFW staff. WDFW staff reviewed a total of 10 projects where these buffer reduction provisions had been applied (see attached summary table). Of these 10, 3 were within the inner 25% of the RHA standard width. All 3 of these were project types for which avoidance of the inner 25% would not have been possible (bridge, bank protection, and dock). All 3 also required Hydraulic Project Approval (HPA) through WDFW, which granted us the opportunity to review the projects and add provisions to ensure protection of fish life.

The mitigation sequencing pattern of avoidance – minimization – compensatory mitigation appears to be effective. Several projects we reviewed did not require compensatory mitigation because they avoided significant impacts to riparian functions/values even though they occurred within the regulated RHA. Furthermore, it is worth noting that this limited (n=10) assessment does not quantify projects which completely avoided the regulated RHA altogether, and thus did not trigger permitting requirements.

Recommendations:

While the existing riparian habitat area reduction provisions in CCC 19.15.130(E)(3)(f) may in theory allow for severe reductions in the areas around streams, rivers, and lakes, in practice such reductions are given due consideration of mitigation sequencing and maintenance of functions and values. The projects we observed within the inner 25% of the standard RHA were all within the inner 25% due to necessity. We recommend adding language to codify this practice to reflect how the provision is being applied. Clear standards could indicate that only water-dependent, water-oriented, or water-related, activities could be permitted in the inner 25%. Those described under CCC 19.15.130(E)(4) and (5) may be a good starting point for a list of specific activities.

We would also recommend adding provisions for RHA averaging. These could be located as another option under 19.15.130(E)(3)(f), and could be similar to wetland buffer width averaging provisions outlined in CCC 19.15.110(C)(4)(d).

Again, we thank you for the opportunity to provide input. Please contact me should you have any questions or need additional information.

Sincerely,

A handwritten signature in black ink, appearing to read "George Fornes". The signature is fluid and cursive, with a large initial "G" and "F".

George Fornes, Biologist
Priority Habitats and Species Program
George.Fornes@dfw.wa.gov, 360-906-6731

cc: David Sherrard, Senior Project Manager/Environmental Planner, Parametrix, Inc.
Sarah Lukas, WA Department of Ecology Shoreline Planner
Rick Mraz, WA Department of Ecology Shoreline Planner
Dave Howe, WDFW Region 5 Habitat Program Manager
Steve West, WDFW Area Habitat Biologist

	F&W Area Name	Type	RHA	Proposal	Outer/Inner %?	Level I/II Assessment?	Mitigation	Notes
51 Walden Island	Silver Lake	S	150	1500 sqft SFR 75' from OHWM	outer 50%	II	Riparian enhancement plantings in 37x20 ft area	
134 Merry Etta Dr	Kalama River	S	150	SFR expansion away from river. No tree removal	? Right on the 50% line	I	No compensatory mitigation. Avoidance/minimization	
407 Coal Creek Rd	Coal Creek	S	150	SFR	Inner 50%	II	No compensatory mitigation. Avoidance. Subsequent mitigation was in response to clearing (5,068 sq ft) in no-development buffer.	Distance to OHWM is ~70 ft, but conforms to envelopes on existing plat (from ~2007).
610 Ostrander Rd	Ostrander Creek	S	150	SFR expansion away from river. No tree removal	outer 50%	I	None	
1660 Tower Rd	Toutle River	S	150	SFR > 75 ft from ohwm	outer 50%	I	No compensatory mitigation req'd. "The proposed project will not impact the function and values of the riparian habitat..."	
1801 Delameter Rd	Delameter Creek	S	150	SFR	Inner 50%	II	Planting 10' wide area along creek	HPA 123588-1 emergency LWM placement. House is ~40ft from OHWM.
2021 Delameter Rd	Delameter Creek	S	150	detached garage > 75 ft from ohwm	outer 50%	I	No compensatory mitigation required.	
Summers Creek Bridge	Summers Creek	F	100	Bridge (52') placement following washout of 6' diameter culvert	Inner 25%	II	No compensatory mitigation proposed, since function was low and bridge is improvement over culvert	Removal of a fish barrier. HPA 119141-01
6923 & 6905 Willow Grove Road (11-0923)	Columbia River	S	150	200 ft of bioengineered Bank Protection (bags and willow stakes) to prevent further erosion	Inner 25%	II	Self-mitigating "because it utilizes native vegetation to restore some of the buffer and erosion resistance functions that existed on the site prior to the clearing of shoreline vegetation for residential development."	Revised later to add more rock material for strength. Revision approved by agencies. 5 yrs monitoring was required to ensure 80% survival of plantings HPA. 123664-3
Preston Beck/ 414 Woodland Park Ln	Lake Merwin	S	150	6x20 floating dock with 3x16 hinged gangway	Inner 25%	II	extra light penetration, plantings on bank adjacent to dock. 5 yrs monitoring	HPA 122920-01