Cumulative Impacts Analysis for City of Port Angeles' Shoreline: Strait of Juan de Fuca

Grant No. G1000051

Prepared June 2011 for:

City of Port Angeles
Community and Economic Development
321 East 5th Street
Port Angeles, WA 98362

The Watershed Company

MAKERS
architecture · planning · urban design

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CUMULATIVE IMPACTS ANALYSIS

CITY OF PORT ANGELES' SHORELINE: STRAIT OF JUAN DE FUCA

1 INTRODUCTION

1.1 Shoreline Management Act Requirements

The Shoreline Management Act guidelines (Guidelines) require local shoreline master programs (SMPs) to regulate new development to "achieve no net loss of ecological function." The Guidelines (WAC 173-26-186(8)(d)) state that, "To ensure no net loss of ecological functions and protection of other shoreline functions and/or uses, master programs shall contain policies, programs, and regulations that address adverse cumulative impacts and fairly allocate the burden of addressing cumulative impacts."

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

> *"When based on the inventory and analysis requirements and completed consistent with the specific provisions of these guidelines, the master program should ensure that development will be protective of ecological functions necessary to sustain existing shoreline natural resources and meet the standard. The concept of "net" as used herein, recognizes that any development has potential or actual, short-term or long-term impacts and that through application of appropriate development standards and employment of mitigation measures in accordance with the mitigation sequence, those impacts will be addressed in a manner necessary to assure that the end result will not diminish the shoreline resources and values as they currently exist. Where uses or development that impact ecological functions are necessary to achieve other objectives of RCW 90.58.020, master program provisions shall, to the greatest extent feasible, protect existing ecological functions and avoid new impacts to habitat and ecological functions before implementing other measures designed to achieve no net loss of ecological functions." [WAC 173-206-201(2)(c)]*

In short, updated SMPs shall contain goals, policies and regulations that are designed to direct actions in a manner to prevent degradation of ecological functions relative to the existing conditions as documented in that jurisdiction's analysis report. For those projects that result in degradation of ecological functions, the required mitigation must at a minimum 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. WAC 173-26-186(8)(d) states "[e]valuation of such cumulative impacts should consider:

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

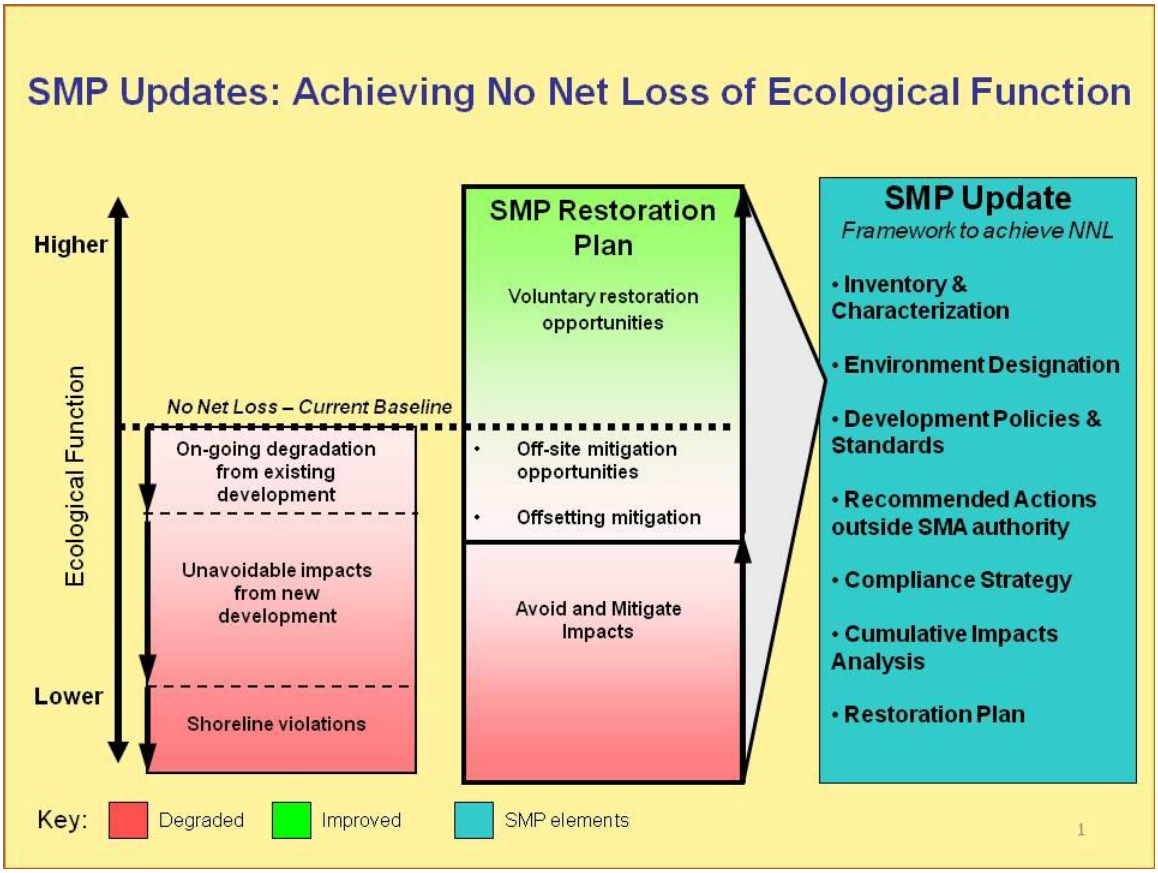

Figure 1. Achieving the no-net loss standard through the Shoreline Master Program process. Source: Department of Ecology

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

1.2 Methodology

Using the textual, numerical and graphical information developed and presented in the *Final Shoreline Analysis Report*, this cumulative impacts analysis was prepared consistent with direction provided in the Guidelines as described above. 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. However, in many cases information about existing conditions and/or redevelopment potential was 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. Further, ecological function does not have an easy metric. For these reasons, much of the following analysis is more qualitative. Any future analysis will incorporate new information and scientific findings to ensure that SMP implementation is in accord with the latest understanding of ecological functions and impacts.

2 EXISTING CONDITIONS

A complete summary of existing conditions can be found in the City of Port Angeles' *Final Shoreline Analysis Report.* This report includes an in-depth discussion of specific reach characteristics and information including geologic hazards, cultural resources, sea level rise, and other topics.

The City's shoreline along the Strait of Juan de Fuca has a wide variety of land uses, including, but not limited to: industrial uses (typically designated High Intensity – Industrial (HI-I) or High Intensity – Commercial (HI-C)); commercial uses (typically designated High Intensity – Commercial (HI-C)), a US Coast Guard base (designated High Intensity – Marine USCG (HI-M)); recreational uses such as parks and trails (typically designated Urban Conservancy – Open Space (UC-OS); a landfill site (designated Urban Conservancy –Landfill (UC-L)); and residential uses (typically designated Shoreline Residential (SR)).

For the purposes of analyzing ecological functions and existing land uses, the City's marine shoreline is divided into 11 primary reaches based on variations in land use and shoreline features (Figures 2a and b). A discussion of the ecological functions in each reach, along with corresponding ratings, can be found in Tables 7 through 17 of the *Final Shoreline Analysis Report*. The ratings of ecological functions in these reaches generally range from "Low/Moderate" to "Moderate." The lack of higher functioning reaches in Port Angeles is due a number of factors, such as extensive shoreline armoring, lack of vegetation, and the large number of over- and in-water structures.

Figure 2a. Shoreline reaches in the Central City portion of the City of Port Angeles.

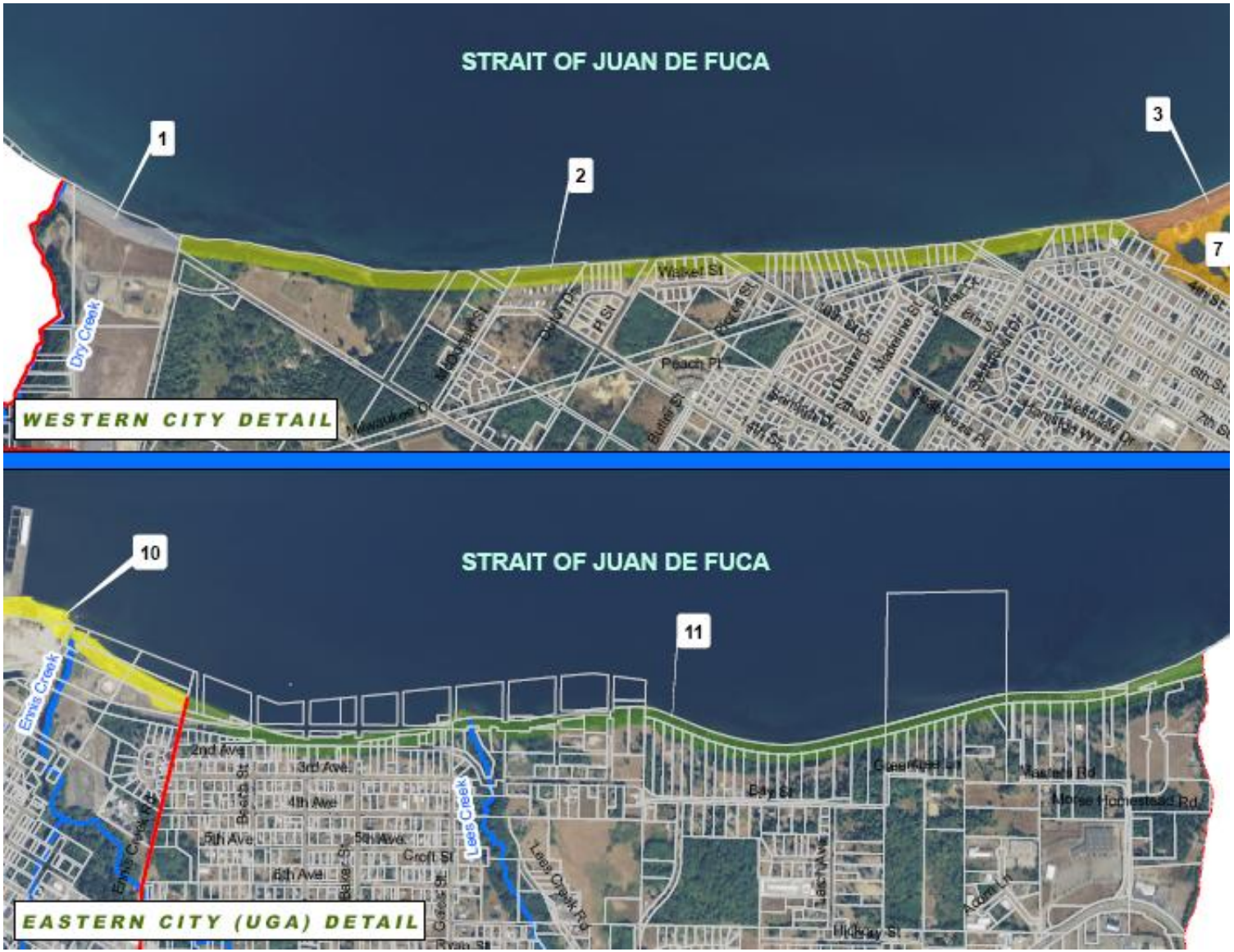

Figure 2b. Map of shoreline reaches for the Western City and Eastern City UGA

Port Angeles Harbor provides the only deepwater port on the northern shore of the Olympic Peninsula. As such, it has attracted industrial activity since the early 1900s. Over time, these industrial activities have degraded habitat and water quality through wood waste, effluent discharge from mills, seepage from the former landfill, and fuel leaks and other contamination from storage and boatyard facilities. Presently, five cleanup sites and one sediment investigation identified in the Port Angeles shoreline are managed by the Department of Ecology. These sites are presented in detail in the *Final Shoreline Analysis Report*.

3 DEVELOPMENT POTENTIAL

The following table includes excerpts from Table 18 in Chapter 5 of the *Final Shoreline Analysis Report*.

Table 1. Existing land use and likely changes in land use along Port Angeles' marine shorelines by reach.

Reaches	Existing Land Use and Likely Changes in Land Use
Reach 1 Landfill	This reach contains a former landfill and current solid waste transfer station. It is zoned Public Buildings and Parks and may be redeveloped as a park, golf course, alternative energy site, or other public use with potential access to the beach and water's edge. Steep bluffs and exposed shoreline make this area unlikely for water-dependent uses. Pending further research and available funding, a seawall and contaminated material from the inactive landfill area along the bluff may be removed.
Reach 2 Western City	This area has two distinct segments: (a) the Ocean View Cemetery and (b) the residences on the bluffs. Again, water-dependent uses are unlikely in this reach due to steep bluffs and exposed shoreline. a) Ocean View Cemetery is zoned Public Buildings and Parks, and land use change is unlikely. Switchback trails may be developed to provide improved access to the beach. b) East of the cemetery, land is zoned for single family and mobile home residential uses. Residential development is underway, and as this fits the Comprehensive Plan designation, land use change is unlikely. Current residences are set back from the OHWM approximately 200 feet, so the buildings are typically just outside of the shoreline jurisdiction. However, the buildings range between 35' and 100' from the top of the bluff, with most of them less than 70' from the top of the bluff.
Reach 3 Outer Industrial	The Nippon Paper plant is located in this reach. The area is zoned Industrial Heavy, and land uses are unlikely to change in the near-term.
Reach 4 Outer Ediz Hook	This area is zoned Public Buildings and Parks and is likely to remain public open space. The Waterfront Trail runs through the center of Ediz Hook, so it is a use applicable to both the Outer and Inner Ediz Hook reaches. The eastern portion of Ediz Hook is likely to remain the U.S. Coast Guard Base.

Reaches	Existing Land Use and Likely Changes in Land Use
Reach 5 Inner Ediz Hook	Along the shoreline, this reach is mostly zoned Industrial Heavy with two spots of Commercial Arterial near the U.S. Coast Guard Station, and a Public Buildings and Parks zone near Nippon at Sail and Paddle Park. American Gold Seafood has offshore floating net pens for raising juvenile salmon south of the Coast Guard and supporting structures on land west of the public boat launch. The Puget Sound Pilots Association has a float for mooring several pilot boats and an office building just east of the boat launch. Although Ediz Hook is typically zoned Industrial Heavy along the southern shoreline, most of Ediz Hook is owned by the City (outside of the Coast Guard Station), is considered part of Ediz Hook open space, and no longer has industrial or commercial uses except for the two mentioned above and the Port's log raft storage offshore. At Sail and Paddle Park, the YMCA now has a boat storage facility. The Lower Elwha Klallam Tribe owns Harborview Park and the parcel around it, and this may be redeveloped to include a marina and improve existing public access. The public Ediz Hook Boat Launch just west of the U.S. Coast Guard will most likely remain, and kayaking and sailing opportunities may increase over time here, on the Lower Elwha Klallam Tribe (LEKT) property and/or at Sail and Paddle Park. There is public interest in a scuba diving area near the western U.S. Coast Guard base, but this potential use conflicts with the Coast Guard's needs. Instead, the former A-frame site, located 2,000 feet east of Sail and Paddle Park, could serve as a dive park if incorporated with ongoing restoration efforts. The eastern portion of Ediz Hook is likely to remain the U.S. Coast Guard Base.
Reach 6 Inner Industrial	This area is zoned Industrial Heavy, and land uses include the Nippon Paper plant, storage facility, and pier used to transfer paper products onto barges; and a Tesoro Petroleum fuel distribution pier and tanks. These uses are unlikely to change in the majority of the reach, although Nippon Paper Industries may redevelop portions of their property to include a biomass cogeneration energy plant. The Waterfront Trail will likely remain in this reach, although its route and wayfinding may be improved per the in-progress Waterfront and Transportation Improvement Plan (WTIP). In addition, opportunity exists for a public access corridor and restoration along the east boundary of the Nippon property.
Reach 7 Lagoon	This area is a natural lagoon and is zoned Public Buildings and Parks. It is unlikely to change land uses. There is potential to restore fish passage through the inlet/outlet channel of the lagoon at all tides, and to restore aquatic and riparian vegetation within the lagoon. Potential also exists for a new public access corridor connecting the eastern shore of Ediz Hook to the western beach around the south edge of the lagoon and some restoration along the drive ditch.
Reach 8A Downtown – Tse-whit-zen	This reach contains Terminal 5, used for cargo and the Port's log yard, and Terminal 7, used as a lay berth facility for vessels up to 750 feet and occasionally for military vessel moorage. The Port-owned shoreline is currently used as a cargo staging area. The land is zoned Industrial Heavy, and the Port's area will likely continue to have industrial uses in the future. The Port owns the property within the 200' shoreline jurisdiction, and the Tse-whit-zen site is inland. The Tse-whit-zen village site is a tribal cemetery and designated by the state as a Cultural and Historic site. The Tse-whit-zen site's zoning is likely to change due to cultural resources on the property. Potential uses of the adjacent lot leased to the tribe by the state of Washington may include an approximately 20,000 sq. ft. artifact curation facility and/or an international research institute and could include public access around the perimeter as appropriate.

Reaches	Existing Land Use and Likely Changes in Land Use
Reach 8 Downtown – Marina	The Boat Haven marina, Yacht Club, and boat ramp are found in this reach. The area is zoned Industrial Heavy and will likely remain a boat moorage facility and boat launch, with some commercial uses, and additional marine commercial development is likely. The breakwater may be reconfigured, and public access may be enhanced to improve safety and usability over time.
Reach 8C Downtown Transition	This reach contains Terminal 3, used for loading cargo on ships; Terminal 1, used for topside repair of ships, loading cargo, and large-vessel (such as cruise ships) moorage; the Westport Shipyard, which manufactures yachts and operates the 500-ton Travelift on the dock adjacent to T-1; Platypus Marine, which provides boat repair services; and Peninsula Plywood, a manufacturing plant that includes a log lift over water. This reach is zoned Industrial Heavy, but may contain more of a mix of uses in the future. Topside repair and vessel berthing uses will most likely remain. Boatyards for mega-yacht construction may expand. If uses change in some areas, public access may be improved. In addition, the Port's Terminal 3 pier may be extended. The outfall of Tumwater Creek, located in this reach, provides habitat and water quality restoration potential.
Reach 8D Downtown Mixed Use	This area is mostly zoned Central Business District with some Commercial Arterial and a small zone of Industrial Light between Peabody Street and Vine Street. Land uses include the Valley Creek Estuary Park, the Waterfront Trail, the currently vacant Oak Street property, Terminal 4 (used for offloading seafood, mooring fishing vessels, and handling supplies for fishing vessels), the Black Ball ferry terminal, the Landing Mall (whose dock is used by Expeditions Northwest and Arrow Launch Services for vessel mooring), the Peabody Creek estuary, the City Pier (which provides summertime transient moorage), the Feiro Marine Life Center, Hollywood Beach, and Haynes Viewpoint. Landward of the shoreline jurisdiction, most properties are commercial north of the bluffs between Valley Creek and Peabody Creek. Above the bluffs in the whole area, more residential uses are found. Some properties may intensify their uses, increase recreational activities on the water, and operate water taxis. The Black Ball ferry terminal may be redesigned. The City Pier may improve their transient moorage, and the Feiro Marine Life Center may be upgraded, refurbished to include expanded uses, or relocated. The Landing Mall may extend its dock and increase its number of tenants, while Expeditions Northwest may move from there to Terminal 4 at the Oak Street property. The Oak Street property will most likely be redeveloped to include a public park and possibly a beach on the City-leased Department of Natural Resources portion per the ongoing Waterfront and Transportation Improvement Plan, with possibly more parkland or other fairly intense uses on the privately owned portion. The Waterfront Trail is likely to remain and possibly be rerouted closer to the water through the Oak Street property. Likewise, the Valley Creek Estuary Park and Hollywood Beach Park are likely to remain parks. Hollywood Beach will be redesigned and expanded, also per the Waterfront and Transportation Improvement Plan, and the City may increase or improve its transient moorage on the City Pier. Some public access improvements are expected at the end of Lincoln Street in association with waterfront redevelopment.
Reach 9 Olympic	This reach contains the Waterfront Trail and residential uses. The Public Buildings and Park zone stretches along the waterfront, accommodating the Waterfront Trail. The landward residential uses are in a Residential Single Family zone and are unlikely to change. Some small areas are zoned Commercial Office around the Olympic Memorial Hospital (which is zoned for Public Buildings and Parks), and over time, some of the residences in this area may be redeveloped as offices. Francis Street Park is partially located on land zoned for single family residential uses, but its use is not likely to change.

Reaches	Existing Land Use and Likely Changes in Land Use
Reach 10 Rayonier	This reach is zoned for Industrial Heavy and Public Buildings and Parks and contains the former Rayonier Mill site. The Rayonier site will most likely be redeveloped with a mix of uses that may include a park and restored estuary, waterfront public access, cultural, high density residential, and commercial. Because historical records provide evidence of cultural resources on the property, future development may be influenced by concerns for not displacing or disturbing a likely village site. Ennis Creek is an important tributary of the Harbor in this reach. Restoration of Ennis Creek and the former Ennis Creek estuary is anticipated in conjunction with the cleanup of the Rayonier site (See Port Angeles Shoreline Restoration Plan). Conceptual plans have been developed, and they include removal of a jetty (over 600 feet long) and dock (over 200,000 square feet in size), as well as other impervious surfaces and structures. Future use and development of the site may include some water-oriented uses and public access. This would likely include replacement of the existing over-water structure, albeit with a much smaller pier.
Reach 11 Eastern City (UGA)	This reach is outside of the City's boundary but included in the Urban Growth Area. Most of the shoreline jurisdiction is zoned Clallam County's Open Space Overlay/Open Space Corridors. The Olympic Discovery Trail runs along the beach in that zone and will most likely remain. Residential uses are found above the bluffs in Urban Low Density and Urban Very Low Density zones. Although these zones barely extend into the shoreline jurisdiction, the residential parcels do cross into the jurisdiction. The distance between the buildings in these parcels and the top of the bluff varies widely from approximately 35 feet to almost 200 feet. Steep bluffs along the shoreline prevent water-dependent uses in this reach, so the beach and bluffs will likely remain predominately open space with residences above the bluffs.

4 PROTECTIVE PROVISIONS

4.1 Environment Designations

The first line of protection of the City's shorelines is the environment designation assignments (see Figure 3).

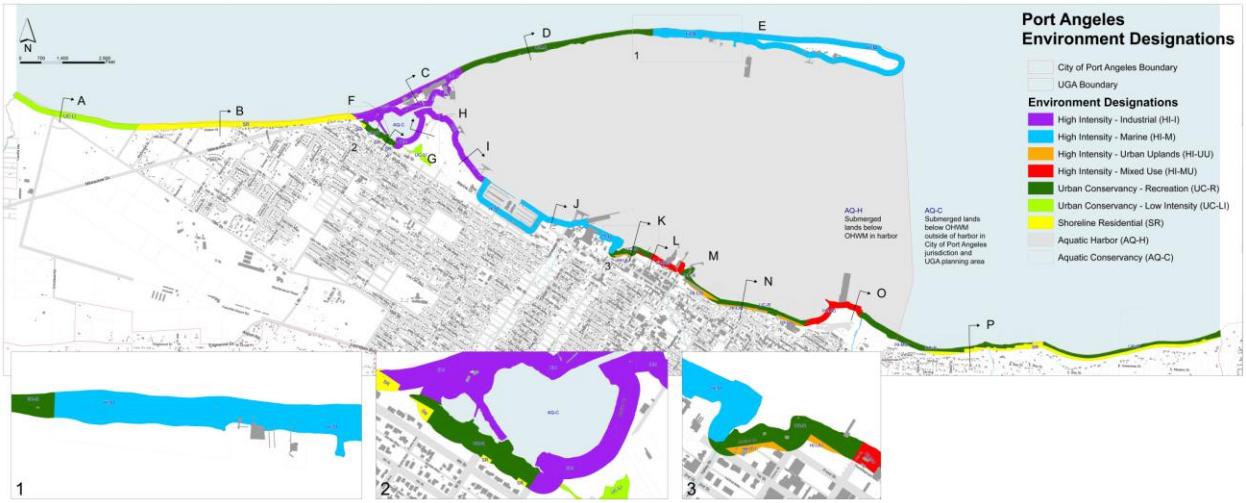

Figure 3. Environment designations for the City of Port Angeles

Environment designations proposed for the City of Port Angeles include: High Intensity – Industrial (HI-I), High Intensity – Marine - (HI-M), High Intensity – Urban Uplands (HI-UU), High Intensity – Mixed Use (HI-MU), Urban Conservancy – Low Intensity (UC-LI), Urban Conservancy – Recreation (UC-R), Urban Conservancy –Landfill (UC-L), Shoreline Residential (SR), Aquatic-Harbor (AQ-H), and Aquatic-Conservancy (AQ-C).

Tables 2 (Table 2 in the SMP) and 3 (Table 1 in the SMP) below identify the prohibited and allowed uses and modifications in each of the shoreline environments.

Table 2. Shoreline Use Matrix (Table 1 in Chapter 2 of the Shoreline Master Program)

P = The use may be permitted
C = The use may be permitted as a conditional use
X = The use is prohibited

SHORELINE USE	High-Intensity-Industrial	High-Intensity-Marine	High-Intensity-Urban Uplands	High-Intensity-Mixed-Use[15]	Urban Conservancy-Low Intensity	Urban Conservancy-Recreation[19]	Shoreline Residential	Aquatic-Harbor[16]	Aquatic-Conservancy[16]
Agriculture	X	X	X	X	X	X	X	X	X
Aquaculture	P	P	P	P	X	X	X	C	X
Boating facilities (including marinas)[17]	X	P	P	P	X	P	X	P	X
Commercial:									
Water-dependent	X[9]	P	P	P	X	P[1]	X	P	X
Water-related, water-enjoyment	X[9]	P	P	P	X	P[1]	X	P[13]	X
Non-water-oriented	X[9]	C[4]	P	P[4]	X	X	X	P[13]	X
Flood hazard management	P	P	P	P	P	P	P	C	X
Forest practices	X[18]	X[18]	X	X	X	X	X	X[18]	X
Industrial:									
Water-dependent	P	P	NA	C[8]	X	X	X	P	X
Water-related, water-enjoyment	P	P	P[12]	C[8]	X	X	X	X	X
Non-water-oriented	P[4]	P[4]	P[12]	X	X	X	X	X	X
Cultural and educational facilities	P	P	P	P	P[10]	P	X	P	X
Government facility – Water-Dependent	P	P	P	P	X	X	X	P	C
Mining	X	X	X	X	X	X	X	X	X
Parking (accessory)	P	P	P	P[2]	X	P[2]	P	X	X
Parking (primary, including paid)	X	X	X	X	X	X	X	X	X
Public Access	P	P	NA	P	P[3]	P	P	P	P
Recreation:									
Water-dependent	P	P	P	P	P[3]	P	P	P	P
Water-enjoyment	P	P[9]	P	P	P[3]	P	P	P[13]	X
Non-water-oriented	P[4,9]	P[9]	P[14]	P[4]	X	P[4]	X	P[13]	X
Single-family residential	X	X	P[12]	X	X	X	P	X	X
Multifamily residential	X	X	P[12]	X	X	X	P[12]	X	X
Land subdivision	P	P	P	P	P[5]	P[5]	P	X	X
Signs:									
On premises	P	P	P	P	X	P[6]	X	X	X
Off premise	X	X	X	X	X	X	X	X	X
Public, highway	P	P	P	P	X	P	X	X	X
Solid waste disposal	X	X	X	X	X	X	X	X	X
Transportation:									
Water-dependent	P	P	P	P	C[3]	P	X	P	C
Non-water-oriented	P[7]	P[7]	P[14]	P	X	C[7]	P	X	X
Roads, railroads	P[7]	P[7]	P[14]	P[7]	X	P[7]	P	X	X
Utilities (primary)	P[7]	P[7]	P[14]	C[7]	C[7]	C[7]	C	C[7]	C[7]

Shoreline Use Matrix Notes:

1. *Only park concessions and uses that enhance the opportunity to enjoy publicly accessible shorelines may be allowed.*
2. *Accessory parking is allowed in shoreline jurisdiction only if there is no other feasible option, as determined by the City.*
3. *Only passive activities that require little development with no significant adverse impacts may be allowed.*
4. *Non-water-oriented uses may be allowed only (a) where the City determines that water-dependent or water-enjoyment use of the shoreline is not feasible due to the configuration of the shoreline and water body or the underlying land use classifications in the comprehensive plan or (b) as part of a mixed-use development with water-dependent uses.*
5. *Land division may be allowed only where the City determines that it is for a public purpose.*
6. *Signs may be allowed only for public facilities and accessory uses within them.*
7. *Roadways and public utilities may be allowed only if there is no other feasible alternative, as determined by the City, and all adverse impacts are mitigated.*
8. *Small-scale water-oriented fabrication and processing, such as repair of hand-launched boats and custom fish processing, may be allowed only where the City determines there are no significant adverse impacts.*
9. *May be allowed only as an accessory use to an otherwise allowed use.*
10. *May be allowed only if the development and use do not cause significant ecological impacts.*
11. *Use may be allowed only if part of a government facility or maritime navigation support facility with water-dependent activities.*
12. *May be allowed only if consistent with the City's zoning ordinance and significant adverse impacts are avoided.*
13. *Allowed only as an accessory use to water-dependent uses and where the development is also adjacent to a High-Intensity – Mixed-Use upland environment.*
14. *May be allowed only if separated from the shoreline (OHWM) by a public right-of-way, trail, or public access walk.*
15. *Special provisions for the Ennis Creek area (former Rayonier Mill site).*
16. *Uses may be allowed in the aquatic environments if they are indicated as "may be permitted" in both the applicable aquatic environment and the adjacent upland environment. Uses may be allowed as a conditional use if indicated as either "may be permitted" or "the use may be permitted as a conditional use" in both the applicable aquatic environment and the adjacent upland environment.*
17. *Dry-land boat storage requires a conditional use permit.*
18. *Log handling and processing of forest products are allowed in the HI-I and HI-M environments. Water-dependent log handling may be allowed in the AQ-H environment adjacent to the HI-I and HI-M environments. See regulations 5.C.15 through .26.*

Table 3. Shoreline Modifications Matrix (Table 2 in Chapter 2 of the Shoreline Master Program)

P = May be permitted
C = May be permitted as a conditional use only
X = Prohibited; the use is not eligible for a variance or conditional use permit
NA = Not applicable

SHORELINE MODIFICATIONS	High-Intensity-Industrial	High-Intensity-Marine	High-Intensity-Urban Uplands	High-Intensity-Mixed-Use	Urban Conservancy-Low Intensity	Urban Conservancy-Recreation	Shoreline Residential	Aquatic-Harbor	Aquatic-Conservancy
Shoreline stabilization:									
Bioengineering	P	P	NA	P	P	P	P	P[1,2,5]	P[1,2,5]
Revetments	P	P	NA	P	C	P	C	P[1,2,5]	P[1,2,5]
Bulkheads	P	P	NA	P	X	C	X	P[1,2,5]	P[1,2,5]
Breakwaters/jetties/rock weirs/groins	P	P	NA	P	X	C	X	P	X
Dikes, levees	C	C	NA	C	C	C	C	P[1,2,5]	P[1,2,5]
Bluff walls	X	X	C[7]	X	X	X	X	NA	NA
Environmental restoration	P	P	P	P	P	P	P	P	P
Clearing and Grading	P	P	P	P	C	P	P	NA	NA
Dredging and dredged material disposal	NA	NA	NA	NA	NA	NA	NA	P[3]	X[6]
Hazardous waste cleanup	P	P	NA	P	P	P	P	P	P
Fill	P	P	P	P	P	P	C	C[1,2,8]	C[8]
Piers, docks	P	P	NA	P	X	P	X	P[1]	C[1]
Moorage piles and mooring buoys	NA	NA	NA	NA	NA	NA	NA	P[4]	C[4]
Outfalls	P	P	NA	P	P	P	P	P	C

Shoreline Modification Matrix Notes:

1. *Allowed in the aquatic environment only if allowed in the nearest upland environment.*
2. *Allowed only to the extent necessary for construction and geometric requirements.*
3. *Dredged material disposal is by conditional use only.*
4. *Private, non commercial mooring piles and buoys are prohibited.*
5. *Modification may be allowed waterward of the OHWM if it enhances ecological functions.*
6. *Dredging and dredged material disposal may be allowed as part of construction of an approved use within the Aquatic Environments (e.g., buried outfall).*
7. *Bluff walls and similar measures may be allowed to protect public roadways and utilities.*
8. *Fill waterward of the OHWM that is for the purpose of restoring ecological functions or as part of a WDOE-approved environmental clean-up action is a permitted use and does not require a conditional use permit.*

4.2 General Goals, Policies and Regulations

The SMP contains numerous general policies, with supporting regulations (see SMP), intended to protect the ecological functions of the shoreline and prevent adverse cumulative impacts. These policies are summarized below.

- The City should give preference to those uses that are consistent with the prevention and control of pollution and prevention of damage to the natural environment, or are unique to or dependent upon uses of the state's shoreline areas.

- The City should ensure that all proposed shoreline development will not diminish the public's health, safety, and welfare, as well as the land or its vegetation and wildlife, and should endeavor to protect property rights while implementing the policies of the Shoreline Management Act.

- The City should reduce use conflicts by prohibiting or applying special permit conditions to those uses which are consistent with the prevention and control of pollution and prevention of damage to the natural environment or are not unique to or dependent upon use of the state's shoreline. In implementing this provision, preference should be given first to water-dependent uses, then to water-related uses and water-enjoyment uses, as defined in Chapter 6, Definitions.

- The City should encourage the full use of existing urban areas before expansion of intensive new development area is allowed, and should adopt an infill-policy for the entire City.

4.3 Shoreline Restoration Plan

As discussed above, one of the key objectives that the SMP must address is "no net loss of ecological shoreline functions necessary to sustain shoreline natural resources" (Ecology 2004). However, SMP updates seek not only to maintain conditions, but to improve them:

> *"…[shoreline master programs] include planning elements that when implemented, serve to improve the overall condition of habitat and resources within the shoreline area of each city and county (WAC 173-26-201(c))."*

The guidelines state that "master programs shall include goals, policies and actions for restoration of impaired shoreline ecological functions. These master program provisions should be designed to achieve overall improvements in shoreline ecological functions over time, when compared to the status upon adoption of the master program" (WAC

173-26-201(2)(f)). Pursuant to that direction, the City has prepared a *Shoreline Restoration Plan*, which is a non-regulatory part of the SMP (Appendix A).

Practically, it is not always feasible for shoreline developments and redevelopments to achieve no net loss at the site scale, particularly for those developments on currently undeveloped properties or those developing a new pier or bulkhead. The *Shoreline Restoration Plan*, therefore, can be an important component in making up that difference in ecological function that would otherwise result just from implementation of the SMP. The *Shoreline Restoration Plan* represents a long-term vision for restoration that will be implemented over time, resulting in ongoing improvement over the existing conditions. Development or preservation that maximizes the amount of ecologically restored and protected area, within the context of allowable commercial uses, is the ideal.

The *Shoreline Restoration Plan* identifies a number of project-specific opportunities for restoration on both public and private properties inside and outside of shoreline jurisdiction, and also identifies ongoing City programs and activities, non-governmental organization programs and activities, and other recommended actions consistent with a variety of watershed-level efforts (see Appendix A in the SMP).

4.4 General Cumulative Impacts Assessment

The following table (Table 4) summarizes for each environment designation and reach segment: the existing conditions, anticipated development, relevant Shoreline Master Program (SMP) provisions, other regulatory provisions and development/restoration programs, and the expected net impact on ecological function. Certain special topics are discussed and analyzed in greater detail in Chapter 5 following the table. The discussion of existing conditions is based on the *Final Shoreline Analysis Report*.

In addition to the environment designations discussed in the following tables, the Aquatic-Harbor and Aquatic-Conservancy designations will apply to those applicable areas of shoreline jurisdiction:

> The purpose of the Aquatic-Harbor Environment is to manage development and uses, and to protect, and, where applicable, restore ecological functions of the areas waterward of the ordinary high water mark within the Ediz Hook Harbor.. An Aquatic-Harbor Environment designation will be assigned to shoreline areas waterward of the ordinary high water mark within Port Angeles Harbor.
>
> The purpose of the Aquatic-Conservancy Environment designation is to protect and enhance the natural characteristics and functions of the areas waterward of the ordinary high water mark outside the Port Angeles Harbor. As opposed to aquatic areas within the AQ-H Environment, those in the AQ-C generally lie outside Ediz Hook and feature much less in-water uses and development. Consequently, the provisions for the AQ-C Environment emphasize ecological

protection and restoration and are generally more restrictive in terms of allowed shoreline uses and modifications. Aquatic-Conservancy areas include:

- Marine waters outside the Port Angeles Harbor as defined in the Aquatic-Harbor designation.
- The lagoon at the base of Ediz Hook.
- Any non-marine water body within the City of Port Angeles' shoreline jurisdiction.

Table 4. General Cumulative Impacts Assessment.

Shoreline Segment	Existing Conditions	Likely Development / Functions or Processes Potentially Impacted	Effect of SMP Provisions	Effect of Other Development and Restoration Activities / Programs	Net Effect
High Intensity – Industrial (HI-I)					
Reach 3 (in full)	**Existing Development:** The Nippon Paper plant is located in this segment. **Existing Functions/Processes:** Hydrologic: Virtually the entire shoreline is armored, presumably altering the rate or type of sediment movement. However, there are no barriers to movement of sediment along the shoreline. Listed as Category 5 for Dissolved Oxygen impairment; No TMDL. Vegetative: No substantive shoreline vegetation. Habitat: In bald eagle buffer.	**Future Development:** Land uses are not expected to change. **Functions/Processes Impacted:** Water Quantity: No change is expected in impervious surface coverage or runoff generated within this reach. Water Quality: No change is expected in water quality in this reach based on ongoing operations alone. The development and implementation of a TMDL to address low dissolved oxygen would likely improve water quality. Vegetation and Habitat: Given the cleared and very developed nature of this shoreline, little degradation of shoreline vegetation and habitat is anticipated.	SMP policies for the HI-I environment (Chapter 2.B 1.c) provide the following guidance: 1. Give priority to water-oriented uses over non-water-oriented uses. First priority should be given to water-dependent uses. Second priority should be given to water-related and water-enjoyment uses. 2. "New development, redevelopment, and uses should include the protection and, where feasible, restoration of shoreline ecological functions, with particular emphasis on habitat for priority species and environmental cleanup." 3. "Visual and physical public access should be required as part of a non-water-oriented development where there are both a public benefit and no security or use conflicts, as provided for in SMP Section 3.B.9" 4. Provide pedestrian, bicycle, and vehicular routes to public access points by establishing shoreline management provisions, as well as undertaking other measures such as street and pathway improvements. 5. The redevelopment or ecological restoration of substandard and degraded urban shoreline areas and obsolete structures should be encouraged. Additionally, general provisions apply for the HI-I environment depending on the location (Chapter 2.C). For reaches 3, 6, and 8A (SMP Segments C, I, and J) facing the Strait of Juan de Fuca or the Harbor, these requirements include a minimum 50 foot vegetation conservation area (VCA) and 50 foot building setback. In SMP Segment C, repair or replacement of shoreline stabilization is allowed; however, non-structural or soft- structural approaches must be used as feasible. In SMP Segment I, new shoreline stabilization may be allowed if necessary to prevent erosion or support water dependent uses. For HI-I environments facing the lagoon (SMP Segment H, reach 7), the minimum VCA and setback are 20 feet. Additionally, existing structures, improvements to existing structures and public access pathways may extend into the VCA and setback areas. Any untreated sewage must be directed away from the lagoon. Any development projects in Section C must consider ecological restoration opportunities. Generally, the SMP does not allow projects that would have a significant impact on ecological functions unless impacts are mitigated according to mitigation sequencing (Chapter 3.B.6.c). Chapter 5.B.5 identifies policies and regulations specific to industrial uses. These regulations provide the following standards relevant to ongoing industrial activities: 4. Long-term storage and/or disposal of industrial wastes is prohibited within shoreline jurisdiction, except that waste water treatment may be allowed in shoreline jurisdiction only if alternate, inland areas have been adequately proven infeasible. 5. Waste disposal, except clean soils and clean dredge spoils, is prohibited within shoreline jurisdiction. The Shoreline Administrator will establish the time period allowed for temporary storage.	Any in- or over-water proposals would require review not only by the City of Port Angeles, but also by the Washington Department of Fish and Wildlife (WDFW), the U.S. Army Corps of Engineers (Corps), and/or the Washington Departments of Ecology and Natural Resources. Each of these agencies is charged with regulating and/or protecting shorelines and the waters of Puget Sound, and would impose certain design or mitigation requirements on applicants. A project that includes in-water fill would require Corps review and permitting. For similar projects along the Puget Sound, a Biological Evaluation would be prepared to assess project impacts on listed fish and wildlife, and that document would be routed to U.S. Fish and Wildlife Service and National Marine Fisheries Service for Endangered Species Act review. These agencies would also impose certain design and mitigation requirements on a proposed project to minimize adverse impacts. The Washington Department of Fish and Wildlife also specifies permit conditions to develop within a bald eagle buffer area. The City maintains a GIS database of all known discharges, outfalls, and receiving waters owned, operated, or maintained by the City. Planned actions include a field assessment of impacted receiving waters, a plan to trace and remove sources of discharges, and program evaluation and assessment. The City's draft Stormwater Management Plan (2010) addresses runoff from new development, redevelopment, and construction activities at sites one acre or greater in size. The City may reduce the size threshold in the future. Actions include employing Ecology's manual for design criteria and best management practices, conducting stormwater plan review and oversight, pre- and post-construction site inspection, and compliance and maintenance standards for stormwater	Significant changes in land use are not anticipated in this reach. Any future redevelopment would need to comply with vegetation, setback, and shoreline modification standards. Any impacts to ecological function would need to be mitigated. Implementation of the draft Stormwater Management Plan will help the City identify and address sources of water quality problems. Restoration activities, including the removal of wood waste from the lagoon will improve water quality and nearshore habitat. Given the above potential impacts and mitigation measures, **no net loss of shoreline functions is expected**.
Reach 6 (in full)	**Existing Development:** Land uses include the Nippon Paper plant, storage facility, and pier used to transfer paper products onto barges; and a Tesoro Petroleum fuel distribution pier and tanks. The Waterfront Trail is also located within this reach. **Existing Functions/Processes:** Hydrologic: Industrial infrastructure likely causes significant interference with natural current patterns. Category 5 for Dissolved Oxygen; Category 2 for 1,2,4-Trichlorobensene; Category 2 for Fecal Coliform. No TMDL. Vegetative: Most areas have no vegetation.	**Future Development:** These uses are unlikely to change in the majority of the reach, although Nippon Paper Industries may redevelop portions of their property to include a biomass cogeneration energy plant. The Waterfront Trail will likely remain in this reach, although its route and wayfinding may be improved. In addition, opportunity exists for a public access corridor along the east boundary of the Nippon property. **Functions/Processes Impacted:** Water Quantity: Slight increase in impervious surface coverage is possible with development of the energy plant. Opportunities to offset this impact include increased shoreline vegetation and adherence to stormwater management requirements.			

Shoreline Segment	Existing Conditions	Likely Development / Functions or Processes Potentially Impacted	Effect of SMP Provisions	Effect of Other Development and Restoration Activities / Programs	Net Effect
	Habitat: In bald eagle buffer, listed as priority abalone habitat.	Water Quality: No change is expected in water quality in this reach based on ongoing operations alone. The development and implementation of a TMDL to address low dissolved oxygen would likely improve water quality. Vegetation and Habitat: Given the cleared and very developed nature of this shoreline, little degradation of shoreline vegetation and habitat is anticipated. Air Quality: Emissions from the proposed energy plant are likely to reduce air quality. This may be of concern to nearby Olympic National Park, which is under pressure to reduce air pollution and associated impacts.	8. New display and other exterior lighting shall, to the extent feasible, be designed, shielded, and operated to avoid illuminating the water surface and reducing light pollution into the night sky and residential areas. 12. Industrial activities, including ship and boat building and repair yards, shall employ Best Management Practices (BMPs) concerning the various services and activities they perform and their impacts on the surrounding water quality. Additionally, new development, expansion or redevelopment of existing facilities would trigger the following requirements (Chapter 5.B.5): 1. Proposed industrial developments or major expansions shall be consistent with Port Angeles Harbor Management Plan, or, if not, be accompanied by a feasibility or use analysis acceptable to the City. 7. At new or expanded port and/or industrial developments, the best available facilities practices and procedures shall be employed for the safe handling of fuels and toxic or hazardous materials to prevent them from entering the water, and optimum means shall be employed for prompt and effective cleanup of those spills that do occur. 9. All industrial loading and service areas shall be located or screened to minimize adverse impacts to the shoreline environment (including visual impacts) and public access facilities, including the Waterfront Trail and Olympic Discovery Trail. 11. Low Impact Development (LID) techniques shall be incorporated where appropriate. The following regulations apply specifically to upland log storage (Chapter 5.B.5): 15. "Unpaved storage areas underlain by permeable soils shall have at least a 4-foot separation between the ground surface and the highest seasonal water table." 16. "Berms, dikes, grassy swales, vegetated buffers, retention ponds or other means shall be used to ensure that surface runoff is collected and discharged from the storage area at one point, if possible. It shall be demonstrated that State water quality standards and/or criteria will not be violated by such runoff under any conditions of flow leaving the site and entering into nearby water courses. If such demonstration is not possible, treatment facilities for runoff shall be provided, meeting city, state, and federal standards." A discussion of overwater structures and shoreline stabilization regulations is included in Section 5, below. Chapter 4.B.6.b, identifies the City's objective to pursue recommendations identified in the Shoreline Restoration Plan (TWC and Makers 2011).	discharge. The City's Sensitive Areas regulations (PAMC 15.20) establish wetland buffers ranging from 25-300 feet depending on wetland rating and intensity of proposed land use. Waters placed on the 303(d) list (Category 5) require the preparation of Total Maximum Daily Loads (TMDLs), a planning tool to clean up polluted waters. TMDLs identify the maximum amount of a pollutant to be allowed to be released into a waterbody so as not to impair uses of the water, and allocate that amount among various sources. In addition, even before a TMDL is completed, the inclusion of a water on the 303(d) list can reduce the amount of pollutants allowed to be released under permits issued by Ecology. The draft Port Angeles Harbor Management Plan identifies priorities and sets a course for improving shoreline habitat, public access, and economic development in the City's core. As identified in the *Shoreline Restoration Plan* (Appendix A of the SMP), several opportunities for improvements to shoreline ecological functions exist: • Planting native vegetation; • Improve conditions along armored shorelines where feasible; • Mitigate effects of armoring by incorporating LWD or through beach nourishment; • Remove wood waste from the lagoon; and • Restore tidal connectivity at all tides to the lagoon.	
Reach 7 (in part)	**Existing Development:** The area around the lagoon includes industrial facilities and parking. **Existing Functions/Processes:** Hydrologic: Outlet may interfere with natural current patterns. Little organic material input. Category 5 with respect to Dissolved Oxygen and Fecal Coliform. No TMDL. Vegetative: Lagoon in this area is buffered by a strip of low-growing vegetation. Habitat: In bald eagle buffer zone.	**Future Development:** Land use change unlikely. Restoration activities may take place at the lagoon. **Functions/Processes Impacted:** Water Quantity: No change is expected in impervious surface coverage or associated runoff. Water Quality: No change is expected in water quality in this reach based on ongoing operations alone. Vegetation and Habitat: Ongoing uses are unlikely to further degrade vegetation or habitat. Restoration of vegetation surrounding the lagoon is possible, in which case, vegetative functions would be improved.			
Reach 8A	**Existing Development:** The shoreline in this segment is highly modified. The uplands in this reach are intensely used for cargo staging and log storage. Two major port terminals are located in this segment, along with several other smaller	**Future Development:** The area within shoreline jurisdiction is expected to continue to serve industrial uses. Zoning at the Tse-whit-zen site, which is adjacent to, but outside of shoreline jurisdiction, is likely to change due to cultural resources on			

Shoreline Segment	Existing Conditions	Likely Development / Functions or Processes Potentially Impacted	Effect of SMP Provisions	Effect of Other Development and Restoration Activities / Programs	Net Effect
	structures. The entire shoreline is armored. **Existing Functions/Processes:** Hydrologic: Altered by terminals and fully armored shoreline. Category 2 for Fecal Coliform. Vegetative: Very limited vegetation exists in this reach to provide functions/processes. Habitat: Part of bald eagle buffer.	the property. Potential uses of the adjacent lot leased to the tribe by the state of Washington, and also outside of the City's shoreline jurisdiction, may include an approximately 20,000 sq. ft. artifact curation facility and/or an international research institute and could include public access around the perimeter as appropriate. **Functions/Processes Impacted:** Hydrologic: Given the highly altered state of the shoreline, the continued use of this area for industrial purposes would not be expected to markedly alter current hydrologic functions/processes. Increased impervious surfaces adjacent to the shoreline associated with the artifact facility would likely increase runoff, however, such development would need to adhere to stormwater regulations. Vegetative/Habitat: Given the highly altered state of the shoreline, the continued use of this area for industrial purposes would not be expected to markedly alter current vegetative or habitat functions/processes.			

High Intensity – Marine (HI-M)					
Reach 4 (in part)	**Existing Development:** Existing development in this segment consists primarily of a runway associated with a Coast Guard base. **Existing Functions/Processes:** Hydrologic: Nearly the entire length of this reach is armored. Vegetative: Most of the area has less than a 20'-wide band of vegetation that consists primarily of grass. Habitat: Though identified as priority habitat by WDFW, unlikely to provide much valuable functions/processes.	**Future Development:** The Coast Guard base is likely to remain. No specific future development activities at the Coast Guard base are known. However, any development in this segment would be minimal as the runway occupies the majority of this segment. **Functions/Processes Impacted:** As no specific future development activities at the Coast Guard base are known, no specific impacts to functions/processes can be determined for the Coast Guard base.	The SMP provides the following management policies for the HI-M environment (Chapter 2.B 2.c): 1. First priority should be given to water-dependent uses. Second priority should be given to water-related and water-enjoyment uses. 2. Where applicable, new development shall include environmental cleanup and restoration of the shoreline in accordance with state and federal requirements and the restoration plan accompanying this SMP. 3. Except at the U.S. Coast Guard base, visual and physical public access should be required as provided for in SMP Section 3.B.8. 4. Provide pedestrian, bicycle, and vehicular routes to public access points. 5. Establish shoreline management provisions to improve the visual qualities in this environment and the views from public properties and substantial numbers of residences. 6. Development in the High-Intensity Marine Environment should be managed so that it enhances and maintains the shorelines for a variety of water-oriented uses, with an emphasis on industrial, maritime, and boating activities. 7. The redevelopment and renewal of substandard and degraded urban shoreline areas and obsolete structures should be encouraged. 8. In regulating uses at the U.S. Coast Guard base, the City recognizes that the U.S. Coast Guard is a use intrinsically essential to achieving the objectives of the Shoreline Management Act. Specifically, the U.S. Coast Guard supports maritime commerce, marine safety, environmental cleanup efforts (e.g., spill response), and water recreation. The Coast Guard also has unique security and operational requirements, so that public access provisions do not apply to the U.S. Coast Guard base property. Additionally, uses accessory to the Coast Guard mission and operations should be allowed on the base. Specific to Reach 4 (SMP Segment E.a), "On Ediz Hook facing the Strait" (Chapter 2.C), but not applicable to the Coast Guard base, the vegetation conservation area (VCA) and building setback extend from the OHWM to the edge of road pavement. The road may be widened, and one rest stop, view point or picnic area up to 200 square feet in area may be constructed within the setback and VCA for every 1200 linear feet of shoreline. Repair of shoreline stabilization measures is permitted; however, mitigation such as beach enhancement or large woody debris placement may be required if shoreline stabilization is enlarged. For Reach 5 (SMP Segment E.b), "On Ediz Hook facing the harbor," the VCA standards also extend from the OHWM to the road, but the minimum structure setback is 15 feet from OHWM for non-water-dependent structures (Chapter 2.C). Furthermore, on the harbor-side, a continuous public access trail must be constructed along the length of the shoreline. In this reach, shoreline stabilization shall be allowed only if it is necessary to protect existing structures or roadways. For Reaches 8B, 8C, and 8D (SMP Segment I), the minimum VCA and structural setback is 50 feet for non-water dependent uses (Chapter 2.C). Structures that are part of a marina or similar water-dependent use may intrude on the VCA and setback. New or enhanced shoreline stabilization may be allowed if necessary to prevent erosion or to support water-	Any in- or over-water proposals would require review not only by the City of Port Angeles, but also by the Washington Department of Fish and Wildlife (WDFW), the U.S. Army Corps of Engineers (Corps), and/or the Washington Departments of Ecology and Natural Resources. Each of these agencies is charged with regulating and/or protecting shorelines and the waters of Puget Sound, and would impose certain design or mitigation requirements on applicants. A project that includes in-water fill would require Corps review and permitting. For similar projects along the Puget Sound, a Biological Evaluation would be prepared to assess project impacts on listed fish and wildlife, and that document would be routed to U.S. Fish and Wildlife Service and National Marine Fisheries Service for Endangered Species Act review. These agencies would also impose certain design and mitigation requirements on a proposed project to minimize adverse impacts. The City's draft Stormwater Management Plan (2010) addresses runoff from new development, redevelopment, and construction activities at sites one acre or greater in size. The City may reduce the size threshold in the future. Actions include employing Ecology's manual for design criteria and best management practices, conducting stormwater plan review and oversight, pre- and post-construction site inspection, and compliance and maintenance standards for stormwater discharge. The City's sensitive areas regulations require wetland buffers varying between 25 and 300 feet based on wetland classification and intensity of proposed land use. Removal of the Elwha dam is planned to commence in September 2011. This action is expected to improve sediment delivery to and beach accretion on the outer side of Ediz Hook. The removal of the dam and sediment delivery will occur over 3 years to ensure that the restoration of sediment processes happens at a rate that will not overwhelm existing conditions. This should	The primary changes anticipated in the HI-M environment include additional marine commercial development and water-dependent industrial development. Reconfiguration of the existing breakwater in Reach 8B could also allow for expanded marina facilities. VCAs and setback standards will generally not apply to these water dependent uses. Shoreline conditions along Ediz Hook are expected to improve substantially through the Elwha dam removal process and continued shoreline restoration along Ediz Hook should also help improve shoreline conditions. A new or reconfigured bulkhead would likely be either open-pile or floating, and existing impacts on sediment movement would be reduced. Redevelopment or expansion of the marina would require review and the City's Shoreline Administrator may require ecological restoration to mitigate for environmental impacts and to ensure no net loss of ecological function. Regulations on overwater structures should minimize the extent of nearshore shading and interference with sediment transport processes. Furthermore, any marina redevelopment would need to comply with vegetation, setback, and shoreline modification standards.
Reach 5 (in part)	**Existing Development:** Existing development in this segment consists of facilities associated with a Coast Guard base. These facilities include several buildings, paved roads and parking areas, and boating infrastructure. **Existing Functions/Processes:** Hydrologic: Extensive armoring and jetties in this segment alter hydrologic processes. Vegetative: Vegetative buffering in this segment is highly variable and consists primarily of grasses. Habitat: Listed by WDFW as priority habitat for hardshell clam, eelgrass, abalone, and shorebird concentrations.	**Future Development:** The Coast Guard base is likely to remain. No specific future development activities at the Coast Guard base are known. However, it is likely that at least some facility renovations will occur. **Functions/Processes Impacted:** As no specific future development activities at the Coast Guard base are known, no specific impacts to functions/processes can be determined.			
Reach 8B (in full)	**Existing Development:** This area consists of a marina, boat launch, and associated upland facilities.	**Future Development:** Existing uses are expected to continue. Additional marine commercial development is likely. The breakwater may be reconfigured			

Shoreline Segment	Existing Conditions	Likely Development / Functions or Processes Potentially Impacted	Effect of SMP Provisions	Effect of Other Development and Restoration Activities / Programs	Net Effect
	Existing Functions/Processes: Hydrologic: Altered by fully armored shoreline a variety of in-water structures. Category 2 for Fecal Coliform. Vegetative: Very limited vegetation exists in this reach to provide functions/processes. Habitat: This reach generally provides poor habitat.	to increase the size of the marina and public access improved over time. **Functions/Processes Impacted:** Hydrologic: Given the highly altered state of the shoreline, the continued use of this area for existing purposes would not be expected to markedly alter current hydrologic functions/processes. Additional commercial development could increase the amount of impervious surfaces slightly; however, such development would need to comply with stormwater regulations. Vegetative/Habitat: Given the highly altered state of the shoreline, the continued use of this area for existing purposes would not be expected to markedly alter current vegetative or habitat functions/processes.	dependent uses. Generally, the SMP does not allow projects that would have a significant impact on ecological functions unless impacts are mitigated according to mitigation sequencing (Chapter 3.B.6.c). The following Shoreline Stabilization Modification Regulations (Ch.4.B.2.c) would apply to the reconfiguration of the breakwater: 28. The effect of proposed breakwaters, rock weirs, and groins on sand movement shall be evaluated during permit review. The beneficiaries and/or owners of large-scale works that substantially alter, reduce, or block littoral drift and cause new erosion of downdrift shores shall be required to establish and maintain an adequate long-term beach replenishment program. 30. Open-pile or floating breakwaters shall be preferred over solid fixed breakwaters. Fixed breakwaters that obstruct movement in the full water column are not allowed unless it can be demonstrated that solid breakwaters will have no significant adverse impacts to natural shoreline processes or that such adverse impacts can be adequately mitigated. 35. Materials used for the construction of breakwaters, jetties, rock weirs, and groins shall be durable, low-maintenance, and compatible with existing shoreline features, processes, and aesthetics. Expansion of the marina, and any overwater structures associated with the boatyards would need to comply with the following regulations (Chapter 4.B.3.c): 4. Only piers and ramps are permitted in the first 30 feet waterward of the OHWM. All floats, ells and fingers must be at least 30 feet waterward of the OHWM. 5. The proposed length must be the minimum necessary to support the intended use. 6. No skirting is permitted on any over-water structure except to contain or protect floatation material. 9. Lighting associated with overwater structures shall minimize light spillage on adjacent properties or waterbodies. 10. Piles, floats and other over water structures that are in direct contact with water or over water shall not be treated or coated with herbicides, fungicides, paint, or pentachlorophenol. Use of wood members treated with arsenate compounds or creosote is prohibited. Furthermore, the following regulations apply to boating facilities specifically (Chapter 5.B.3.c): 5. Boating facilities shall not be located where their development would reduce the quantity or quality of critical aquatic habitat or where significant ecological impacts would occur. On degraded shorelines, the City's Shoreline Administrator may require ecological restoration measures to account for environmental impacts and risks to the ecology and to ensure no net loss of ecological function.	greatly enhance the nearshore function in Reach 4 in the next decade and beyond. As identified in the *Shoreline Restoration Plan* (Appendix A of the SMP), several opportunities for improvements to shoreline ecological functions exist within the HI-M environment. Nearshore restoration of a 1,200 foot section of Ediz Hook, sponsored by DNR and LEKT, is also scheduled to begin in early summer 2011. Restoration of the mouth of Tumwater Creek and riparian revegetation are identified as possible enhancement approaches in the more developed reaches of the HI-M environment. Enhancement of existing shoreline armoring by incorporating bioengineering approaches is also proposed.	Implementation of the draft Stormwater Management Plan will help the City identify and address sources of water quality concerns. Ultimately, the combination of SMP regulations, planned and ongoing restoration projects, and state and federal regulations are expected to result in **no net loss of shoreline functions**.
Reach 8C (in full) and Reach 8D (in part)	**Existing Development:** This reach contains two port terminals, a shipyard with associated Travelift, a boat repair business, and a manufacturing plant that includes a log lift over water. **Existing Functions/Processes:** Hydrologic: Altered by fully armored shoreline and a variety of in-water structures. Vegetative: Very limited vegetation exists in this reach to provide functions/ processes. Habitat: Tumwater Creek contains priority species and provides minimal estuarine/riparian habitat.	**Future Development:** Topside repair and vessel berthing uses will most likely remain. Boatyards for mega-yacht construction may expand. If uses change in some areas, public access may be improved. In addition, the Port's Terminal 3 pier may be extended. **Functions/Processes Impacted:** Hydrologic: Given the highly altered state of the shoreline, the continued use of this area for industrial purposes would not be expected to markedly alter current hydrologic functions/processes. Vegetative/Habitat: Given the highly altered state of the shoreline, the continued use of this area for industrial purposes would not be expected to markedly alter current vegetative or habitat functions/processes.			

Shoreline Segment	Existing Conditions	Likely Development / Functions or Processes Potentially Impacted	Effect of SMP Provisions	Effect of Other Development and Restoration Activities / Programs	Net Effect
			6. Boating facility design shall: a. Provide thorough flushing of all enclosed water areas and shall not restrict the movement of aquatic life requiring shallow water habitat. b. Minimize interference with geohydraulic processes and disruption of existing shoreline ecological functions. c. Minimize the adverse impacts of shading of the water surface by over-water structures through means such as but not limited to: i. Minimization of over-water coverage, ii. Elevation of the pier above the water to the maximum extent reasonable and limiting floats in the nearshore area, iii. Incorporating grating that allows light penetration. Further discussion of the likely effects of overwater structures and shoreline stabilization regulations is included in Section 5, below. New or expanded boatyards fall under industrial development, and the following regulations apply (Chapter 5.B.5.c): 7. At new or expanded port and/or industrial developments, the best available facilities practices and procedures shall be employed for the safe handling of fuels and toxic or hazardous materials to prevent them from entering the water, and optimum means shall be employed for prompt and effective cleanup of those spills that do occur. 8. New display and other exterior lighting shall, to the extent feasible, be designed, shielded, and operated to avoid illuminating the water surface and reducing light pollution into the night sky and residential areas. 11. Low Impact Development (LID) techniques shall be incorporated where appropriate. 12. Industrial activities, including ship and boat building and repair yards, shall employ Best Management Practices (BMPs) concerning the various services and activities they perform and their impacts on the surrounding water quality. Chapter 4.B.6.b. identifies the City's objective to pursue recommendations identified in the Shoreline Restoration Plan (TWC and Makers 2011).		
High Intensity – Urban Uplands (HI-UU)					
Reach 8D (in part)	**Existing Development:** Includes retail, commercial, industrial/manufacturing, and hotel/motel uses. There also are nine undeveloped/vacant parcels, one of which includes a parking lot. All of these parcels are generally separated from the shoreline by street or trail ROW. In one case, a parcel is separated from the shoreline by a public parcel. **Existing**	**Future Development:** Parcels with existing development can be expected to undergo typical renovations or potentially structure replacement. Commercial development in the nine undeveloped parcels should be expected at a level similar to the surrounding development. **Functions/Processes Impacted:** New development in the existing undeveloped lots is expected to increase impervious surface cover and reduce vegetation slightly. Any	General management policies for the HI-UU environment (Chapter 2.B.3.c) include: 1. Uses should be limited to those that do not conflict with water-oriented activities and public access on the shoreline. 2. New development should not substantially diminish visual and physical public access. 3. Provide comfortable and attractive pedestrian, bicycle, and vehicular routes to public access points by establishing shoreline management provisions, as well as undertaking other measures such as street and pathway improvements. General Policies and Regulations (Ch.5.B.1.b):	The primary action identified in the Shoreline Restoration Plan (Appendix A of the SMP) applicable to the HI-UU environment is to remediate stormwater management in the watershed to collect, treat, and discharge stormwater in a manner that avoids adverse impacts to surface waters. The City's draft Stormwater Management Plan (2010) addresses runoff from new development, redevelopment, and construction activities at sites one acre or greater in size. The City may reduce the size threshold in the future. Actions include employing Ecology's manual for design criteria and best management practices,	Likely future development in the HI-UU environment is generally separated from the shoreline by a street or trail. This limits the direct effects of the development on shoreline habitat; however the potential exists for degradation of water quality or for generating increased surface water by increasing impervious surfaces. Overall, the level of new development potential in the HI-UU environment is quite

Shoreline Segment	Existing Conditions	Likely Development / Functions or Processes Potentially Impacted	Effect of SMP Provisions	Effect of Other Development and Restoration Activities / Programs	Net Effect
	Functions/Processes: These highly developed urban parcels are separated from the shoreline and do not contribute significantly to shoreline functions/ processes.	new development would need to comply with stormwater regulations, encouraging on-site infiltration and limiting runoff. Additionally, because these parcels are separated from the shoreline, impacts to functions/processes would be minimal.	1. The City should give preference to those uses that are consistent with the control of pollution and prevention of damage to the natural environment, or are unique to or dependent upon uses of the state's shoreline areas. 2. The City should ensure that all proposed shoreline development will not diminish the public's health, safety, and welfare, or adversely impact ecological functions. The vegetation conservation area (VCA) extends 50 feet beyond the top of the bluff (Chapter 2.C) for Segment N "From City Pier Park to Rayonier Property") and 70 feet from the OHWM for Segment K "Shorelines from Valley Creek Estuary to Oak Street." Furthermore, setback standards apply based on geologically hazardous area regulations (Chapter 3.B.5.c). These requirements include review by a licensed geotechnical professional; certification that the structure will not be in danger from erosion for at least 75 years; and a marine bluff setback at least equal to the annual erosion rate times 75 years plus 20 feet. Regulations specific to commercial development (Chapter 5.B.4.c): 2. Commercial development shall be designed to avoid or minimize and mitigate ecological impacts, to protect human health and safety, and to avoid significant adverse impacts to surrounding uses and the shoreline's visual qualities 3. All new non-water-oriented commercial development, where allowed, shall be conditioned with the requirement to provide ecological restoration and public access, unless such measures are demonstrated to be not feasible. Additionally, Chapter 5.B.8.c requires that all new and redeveloped residences control stormwater runoff according to the most recent version of the City's Urban Services Standards and Guidelines, current edition. Chapter 4.B.6.b. identifies the City's objective to pursue recommendations identified in the Shoreline Restoration Plan (TWC and Makers 2011).	conducting stormwater plan review and oversight, pre- and post-construction site inspection, and compliance and maintenance standards for stormwater discharge. The draft Port Angeles Harbor Management Plan identifies priorities and sets a course for improving shoreline habitat, public access, and economic development in the City's core. The City's Sensitive Areas regulations require wetland buffers varying between 25 and 300 feet based on wetland classification and intensity of proposed land use (PAMC15.20).	low, and stormwater management and LID practices should minimize the risk of increased water quality and hydrologic impacts to the extent such that **no net loss of shoreline function is anticipated**.
Reach 9 (in part)	**Existing Development:** Includes single- and multi-family residential and commercial land uses. There also is one undeveloped vacant parcel. All parcels are separated from the shoreline by at least trail ROW. **Existing Functions/Processes:** These parcels are separated from the shoreline do not contribute significantly to shoreline functions/ processes.	**Future Development:** Parcels with existing development can be expected to undergo typical renovations or potentially structure replacement. **Functions/Processes Impacted:** Because these parcels are separated from the shoreline, impacts to functions/processes would be minimal.			
High Intensity – Mixed Use (HI-MU)					
Reach 8D (in part)	**Existing Development:** Piers (Black Ball ferry terminal) and (the Landing Mall). **Existing Functions/Processes:** Hydrologic: Heavily altered by fully armored shoreline and piers. Category 2 for Fecal Coliform in segments A, B, and D. Vegetative: Virtually no	**Future Development:** Some properties may intensify their uses, increase recreational activities on the water, and establish water taxis. The Black Ball ferry terminal may be redesigned. The Landing Mall may extend its dock and increase its number of tenants, while Expeditions Northwest may move from the Landing to Terminal 4 at the Oak Street property. Development along this reach may also include items being included in the WTIP, which include the possibility of some	General management policies for the HI-MU environment (Chapter 2.B.4.c) include: 3. New development should protect and, where feasible, restore shoreline ecological functions, with particular emphasis on habitat for priority species and environmental clean-up. The development of new transportation facilities, such as a ferry terminal or water taxi facility requires the following (Chapter 5.B.9.c): 2. Development of new or expanded transportation facilities that cause significant ecological impacts shall not be allowed unless the development includes shoreline mitigation/restoration that increases the ecological functions being impacted to the point where: a. Significant short- and long-term risks to the shoreline ecology from the	Any in- or over-water proposals would require review not only by the City of Port Angeles, but also by the Washington Department of Fish and Wildlife (WDFW), the U.S. Army Corps of Engineers (Corps), and/or the Washington Departments of Ecology and Natural Resources. Each of these agencies is charged with regulating and/or protecting shorelines and the waters of Puget Sound, and would impose certain design or mitigation requirements on applicants. A project that includes in-water fill would require Corps review and permitting. For similar projects along the	A substantial amount of redevelopment is anticipated in the HI-MU environment. Several restoration activities are planned in association with future redevelopment. At the Rayonier site in particular, contaminant and derelict structure removal should improve water quality conditions, as well as aquatic habitat. Even with future redevelopment,

Shoreline Segment	Existing Conditions	Likely Development / Functions or Processes Potentially Impacted	Effect of SMP Provisions	Effect of Other Development and Restoration Activities / Programs	Net Effect
	vegetation to provide functions/processes. Habitat: This area is of scant habitat value.	overwater viewing areas, recreated beach areas at the Oak St. property, parking, landscaping, and enhanced pedestrian opportunity. **Functions/Processes Impacted:** Further development is not likely to significantly alter the existing degraded state of hydrologic and vegetative functions in this reach. Some improvement in vegetation or shoreline habitat may occur through mitigation for any redevelopment.	development are eliminated. b. Long-term opportunities to increase the natural ecological functions and processes are not diminished. 5. New transportation facilities shall be located and designed to prevent or to minimize the need for shoreline protective measures such as riprap or other bank stabilization, fill, bulkheads, groins, jetties, or substantial site grading. 13. All shoreline areas disturbed by construction and maintenance of transportation facilities shall be replanted and stabilized with native, drought-tolerant, self-sustaining vegetation by seeding, mulching, or other effective means immediately upon completion of the construction or maintenance activity. Recreational development regulations (Chapter 5.B.7.c) require review of any new recreational development proposal by the City's Shoreline Administrator for ecological restoration and public access opportunities. When restoration or public access plans indicate opportunities exist for these improvements, the City's Shoreline Administrator may require that those opportunities are either implemented as part of the development project or that the project design be altered so that those opportunities are not diminished. VCA and setback standards were not established for the downtown waterfront (SMP Segment L, reach 8D). New shoreline stabilization is also allowed in this area to protect a water-oriented use or public structure. Only water-oriented uses are allowed on the ground flood of buildings facing the water. Standards applicable to SMP Segment O (reach 10), the Rayonier site have not been established due to the uncertainty surrounding the future of the site. Instead, the SMP establishes the following guiding principles for land use at the site. 1. Development and significant vegetation removal is not allowed within the Vegetation Conservation Area running parallel to Ennis Creek. The VCA shall be sufficiently wide to effectively protect and restore applicable shoreline ecological processes and functions. 2. Development must include opportunities for public access. 3. New non-water-dependent development must be set back sufficiently and separated from the marine shoreline OHWM and a VCA established to provide for the protection and the restoration of ecological processes and functions. As a default, the setback/vegetation conservation area shall be 100 feet from OHWM unless scientific studies indicate that a lesser setback is sufficient to maintain the same level of ecological functions, 4. Water-dependent development may intrude into the setback/VCA along the marine shoreline provided that development does not cause unmitigated adverse impacts to ecological functions. Development within the shoreline shall be permitted in a manner that minimizes intrusions into the setback/VCA. The likely effects of overwater structures and shoreline stabilization based on SMP provisions are discussed in detail in section 5, below. The following regulations apply to over-water structures (Ch.4.B.3.c): 5. The proposed length must be the minimum necessary to support the intended use.	Puget Sound, a Biological Evaluation would be prepared to assess project impacts on listed fish and wildlife, and that document would be routed to U.S. Fish and Wildlife Service and National Marine Fisheries Service for Endangered Species Act review. These agencies would also impose certain design and mitigation requirements on a proposed project to minimize adverse impacts. The Washington Department of Fish and Wildlife also specifies permit conditions to develop within a bald eagle buffer area. The draft Port Angeles Harbor Management Plan identifies priorities and sets a course for improving shoreline habitat, public access, and economic development in the City's core. The City maintains a GIS database of all known discharges, outfalls, and receiving waters owned, operated, or maintained by the City. Planned actions include a field assessment of impacted receiving waters, a plan to trace and remove sources of discharges, and program evaluation and assessment. The City's draft Stormwater Management Plan (2010) addresses runoff from new development, redevelopment, and construction activities at sites one acre or greater in size. The City may reduce the size threshold in the future. Actions include employing Ecology's manual for design criteria and best management practices, conducting stormwater plan review and oversight, pre- and post-construction site inspection, and compliance and maintenance standards for stormwater discharge. The City's Sensitive Areas regulations require wetland buffers varying between 25 and 300 feet based on wetland classification and intensity of proposed land use (PAMC 15.20). The former Rayonier site is a focus of upcoming shoreline restoration in the City. Contaminant cleanup at the site is in the planning stage, and a survey and removal	substantial reductions in shoreline armoring and overwater structures are expected. Furthermore, new standards to minimize the impacts of new or expanded overwater structures should reduce the overall impact on shoreline functions. Mitigation is also likely to improve shoreline vegetative functions. The SMP provisions, combined with planned and ongoing restoration projects, and state and federal regulations are expected to result in **no net loss of ecosystem functions** in the HI-MU environment.
Reach 10 (in part)	**Existing Development:** This reach contains the former Rayonier mill site. Upland structures have been removed; however, the site remains highly altered, with areas of shoreline armoring, a 600-foot-long breakwater/jetty, over 5 acres of overwater cover, impervious surfaces, and very sparse shoreline vegetation **Existing Functions/Processes:** Hydrologic: Armoring and jetties interfere with sedimentation and current patterns. Category 5 for sediment bioassay; no TMDL. Vegetative: Site generally has no functional vegetated buffer. Habitat: Priority habitat for red sea urchin. Also harbor seal and seal haul outs, bald eagle nest buffer, and seabird colony.	**Future Development:** The Rayonier site will most likely be redeveloped with a mix of uses that may include a park and restored estuary, waterfront public access, cultural, high density residential, and commercial. A conceptual plan for restoration of the site includes the removal of the jetty and pier. Significant restoration is also planned for the mouth of Ennis Creek. Future use and development of the site may include some water-oriented uses and public access. This would likely include replacement of the existing 200,000 square foot over-water structure, albeit with an extremely smaller pier. Note: the existing City Pier is approximately 20,000 square feet (not including fingers). **Functions/Processes Impacted:** Hydrologic: The development of new structures and utilities within upland areas will likely increase the current level of impervious surface coverage in those upland areas and areas outside of shoreline jurisdiction. Stormwater standards to control runoff should minimize any hydrologic impacts from development. Shoreline hydrologic functions will vastly improve upon the removal of the 600-foot-long jetty, pull-back of shoreline armoring both east and west of the existing pier, and replacement of the existing 5-acre pier (including ~10,000 piles) with a significantly smaller structure.			

Shoreline Segment	Existing Conditions	Likely Development / Functions or Processes Potentially Impacted	Effect of SMP Provisions	Effect of Other Development and Restoration Activities / Programs	Net Effect
		Water and sediment quality issues should be addressed and substantially improved through restoration and redevelopment actions. Vegetative: Planned park development and estuarine restoration should significantly improve vegetative functions at this site. Restoration of nearshore vegetation is planned for the Ennis Creek delta, as well as the shoreline to the east. It is also expected that nearshore vegetation would be provided along the majority of the shoreline west of Ennis Creek upon redevelopment of the site. Habitat: Nearshore and terrestrial habitat should be substantially improved from their existing states through the planned estuarine and Ennis Creek restoration.	9. Lighting associated with overwater structures shall minimize light spillage on adjacent properties or waterbodies. 10. Piles, floats and other over water structures that are in direct contact with water or over water shall not be treated or coated with herbicides, fungicides, paint, or pentachlorophenol. Use of wood members treated with arsenate compounds or creosote is prohibited. 25. Bulk storage for gasoline, oil, and other petroleum products for any use or purpose is prohibited on piers, wharves, and docks. Bulk storage means non-portable storage in fixed tanks. Chapter 4.B.6.b. identifies the City's objective to pursue recommendations identified in the Shoreline Restoration Plan (TWC and Makers 2011).	of derelict structures at the site is also planned. The Ennis Creek Conceptual Restoration Plan, co-authored by the LEKT and Rayonier, includes recommendations and conceptual designs to remove the pier, jetty, all concrete structures, an asphalt parking lot, and return lower Ennis Creek to its natural meander and estuary habitat. The future use of the Rayonier site remains uncertain; some restoration and some future shoreline development are likely. A conservative estimate of changes that will result from restoration and development in the near term includes: • Full restoration of the lower Ennis Creek system including the "delta" and any channel migration that might happen in shoreline jurisdiction. • Removal of the existing, approximately 200,000 square foot pier is likely. Development of a smaller pier for water dependent uses (likely a public access pier, similar to Union Wharf or the Port Angeles City Pier, which are approximately 12,000 and 20,000 square feet respectively). • The existing jetty will be removed, but there may need to be some soft stabilization for the resulting beach. Removal of the existing jetty will have a substantial impact on restoring natural currents and hydrologic processes to the City's nearshore area. • It is also reasonable to assume that substantial nearshore riparian restoration will occur over significant sections of the Rayonier shoreline west and east of Ennis Creek.	
Urban Conservancy – Recreation (UC-R)					
Reach 4 (in part)	**Existing Development:** Currently public open space. The Waterfront Trail runs through the center of Ediz Hook.	**Future Development:** No development known. **Functions/Processes Impacted:** Existing functions are not likely to change since no development is	General management policies for the UC-R environment (Chapter 2.B.6.c) include: 2. Commercial activities enhancing the public's use or enjoyment of publicly accessible shorelines, such as food or boating concessions, may be appropriate if set back from the shoreline to allow for public access and	Any in- or over-water proposals would require review not only by the City of Port Angeles, but also by the Washington Department of Fish and Wildlife (WDFW), the U.S. Army Corps of Engineers (Corps), and/or the Washington Departments of	Much of the anticipated development in the UC-R environment is associated with the development or expansion of recreational uses. Since the SMP

Shoreline Segment	Existing Conditions	Likely Development / Functions or Processes Potentially Impacted	Effect of SMP Provisions	Effect of Other Development and Restoration Activities / Programs	Net Effect
	Existing Functions/Processes: **Existing Functions/Processes:** Hydrologic: Nearly the entire length of this reach is armored. Vegetative: Most of the area has less than a 20'-wide band of vegetation that consists primarily of grass. Habitat: Though identified as priority habitat by WDFW, unlikely to provide much valuable functions/processes.	anticipated in this reach.	ecological restoration. 3. Water-dependent and water-enjoyment recreation facilities compatible with the protection of ecological functions, such as boating facilities, angling, wildlife viewing trails, and swimming beaches, are preferred uses, provided significant ecological impacts to the shoreline are avoided or mitigated. 4. During development and redevelopment, all reasonable efforts, as determined by the City, should be taken to restore ecological functions. Specific to Reach 4 and 5 (SMP Segment D "Ediz Hook Shoreline"), the VCA and setback extend from the OHWM to the road (Chapter 2.C). An exception is made in Reach 4 for rest stops, view points, and picnic areas, which may occupy a maximum of 200 square feet within the setback for every 1,200 feet of shoreline. For Reach 5, a continuous public access trail must be constructed along the length of shoreline. VCA and setback distances cover all of the shoreline jurisdictional area (200 feet from OHW) in the UC-R sections of Reaches 7, 9, and 11 (SMP Segments F & N). VCA and setbacks for Reach 8D (SMP Segments K & M) are 70 feet and existing structures may remain and be improved within the parkland setback. In reach 11 (SMP Segment P), the VCA and setback of 60 feet beyond the top of bluff generally covers all of shoreline jurisdiction. Vegetation removal is allowed within the VCA in Segment P if a certified licensed professional arborist, biologist, or landscape architect certifies that vegetation removal will not cause significant ecological impacts. Chapter 5.B.2.c of the SMP states that fish net-pens are allowed as a conditional use only. Additionally, aquaculture shall avoid use of chemicals, fertilizers and genetically modified organisms except when allowed by state and federal law. Log storage and booming is regulated under Chapter 5.B.5.c of the SMP: 18. Log storage shall not be permitted in public waters where the Shoreline Administrator determines that water quality standards cannot be met at all times or where these activities are a hindrance to other beneficial water uses such as navigation. 19. The free-fall, violent dumping of logs into water shall be prohibited. Easy let-down devices shall be employed for placing logs in the water per the Port of Port Angeles BMP approved as part of Washington State Department of Natural Resources harbor area lease agreements. 20. Positive bark and wood debris control, collection and disposal methods shall be employed at log dumps, raft building areas and mill-side handling zones. This shall be required for both floating and sinking particles. 21. Log dumps shall not be located in waters where bark and debris controls cannot be effectively provided. 22. Logs shall not be dumped, stored or rafted where they will rest on the bedlands at low tide. The following regulations apply to water oriented recreational development (Chapter 5.B.7.c): 3. All new recreational development proposals will be reviewed by the City's	Ecology and Natural Resources. Each of these agencies is charged with regulating and/or protecting shorelines and the waters of Puget Sound, and would impose certain design or mitigation requirements on applicants. A project that includes in-water fill would require Corps review and permitting. For similar projects along the Puget Sound, a Biological Evaluation would be prepared to assess project impacts on listed fish and wildlife, and that document would be routed to U.S. Fish and Wildlife Service and National Marine Fisheries Service for Endangered Species Act review. These agencies would also impose certain design and mitigation requirements on a proposed project to minimize adverse impacts. The Washington Department of Fish and Wildlife also specifies permit conditions to develop within a bald eagle buffer area. The draft Port Angeles Harbor Management Plan identifies priorities and sets a course for improving shoreline habitat, public access, and economic development in the City's core. The City has developed and implemented a program with the goal of preventing or reducing pollutant runoff from municipal operations. It includes annual inspections, spot checks, road runoff control and maintenance, public land runoff control, and maintenance, and a stormwater pollution prevention plan (SWPPP). The City's Sensitive Areas regulations require wetland buffers varying between 25 and 300 feet based on wetland classification and intensity of proposed land use. Removal of the Elwha dam is planned to commence in September 2011. This action is expected to improve sediment delivery to and beach accretion on the outer side of Ediz Hook. The removal of the dam and sediment delivery will occur over 3 years to ensure that the restoration of sediment processes happens at a rate that will not	requires that the development of recreational uses consider restoration opportunities, priority restoration projects identified in the Shoreline Restoration Report are likely to be implemented in this environment. Shoreline conditions along outer Ediz Hook are expected to improve substantially through the Elwha dam removal process. Continued restoration along the inner Ediz Hook will reduce shoreline armoring, reduce impervious surface coverage, and increase vegetative and shoreline habitat functions. Revegetation of the area east of Ennis Creek on the Rayonier site is also expected. These revegetation efforts are likely to significantly improve shoreline functions in the Creek and on the marine shoreline. Overall, SMP regulations, and state and federal requirements will limit the impacts of development along the UC-R environment. Furthermore, planned restoration of vegetation and habitat will likely result in **a net improvement of shoreline ecosystem function**.
Reach 5 (in part)	**Existing Development:** Development in this segment includes a float for mooring pilot boats used by The Puget Sound Pilots Association and an associated office building, a public boat launch. This area also includes a Port log raft storage area and an aquaculture operation with offshore floating net pens for raising juvenile salmon and supporting structures on land west of the public boat launch. A vacant city owned building (once used as a restaurant) also occurs in the area. **Existing Functions/Processes:** Hydrologic: Extensive armoring and jetties in this segment alter hydrologic processes. Vegetative: Vegetative buffering in this segment is highly variable and consists primarily of grasses. Habitat: Listed by WDFW as priority habitat for hardshell clam, eelgrass, abalone, and shorebird concentrations.	**Future Development:** The public boat launch will likely remain. Beginning in the summer of 2011, restoration of 1,200 linear feet of shoreline is planned, led by DNR and the LEKT. Restoration will include removal of fill, concrete, asphalt, riprap, piles, and bulkheads. Large wood, gravel, sand, and native vegetation will be added to the site to protect the existing road and restore shoreline functions. A former A-frame site located 2,000 feet east of Sail and Paddle Park could serve as a dive park if incorporated with ongoing restoration efforts. The vacant restaurant structure may be redeveloped as a future commercial use. A public trail will be constructed along the road. **Functions/Processes Impacted:** Hydrologic: The development of a public trail will likely reduce permeability of the soils, generating a slight increase in runoff within the reach. Shoreline restoration will reduce armoring and restore sediment processes. Vegetative and Habitat: Vegetative functions and shoreline and aquatic habitat will improve through restoration actions.			

Shoreline Segment	Existing Conditions	Likely Development / Functions or Processes Potentially Impacted	Effect of SMP Provisions	Effect of Other Development and Restoration Activities / Programs	Net Effect
Reach 7 (in part)	**Existing Development:** This land consists of open space surrounding the lagoon. **Existing Functions/Processes:** This portion of the reach provides high vegetative function through forested wetlands. These wetlands provide bald eagle habitat and other terrestrial habitats. Shoreline habitat within the lagoon is limited by wood debris and limited tidal connectivity.	**Future Development:** The Waterfront Trail is likely to remain and possibly be rerouted closer to the water. There is potential for restoration of the lagoon and a new public access corridor connecting the eastern shore of Ediz Hook to the western beach around the south edge of the lagoon. **Functions/Processes Impacted:** Significant changes to shoreline functions are not anticipated in this reach. Revegetation as mitigation for rerouting the trail or adding public access routes may result in improved vegetative functions.	Shoreline Administrator for ecological restoration and public access opportunities. When restoration or public access plans indicate opportunities exist for these improvements, the City's Shoreline Administrator may require that those opportunities are either implemented as part of the development project or that the project design be altered so that those opportunities are not diminished. 4. Non-water-oriented structures, such as restrooms, recreation halls and gymnasiums, recreational buildings and fields, access roads, and parking areas, shall be preferentially located outside of the shoreline jurisdiction. If the City's Shoreline Administrator deems this not feasible, then these structures shall be set back from the OHWM at least 70 feet unless it can be shown that there is no feasible alternative. Chapter 4.B.6.b. identifies the City's objective to pursue recommendations in the Shoreline Restoration Plan (TWC and Makers 2011).	overwhelm existing conditions. This should greatly enhance the nearshore function in Reach 4 in the next decade and beyond. In February, 2011, the City council adopted the Waterfront Transportation Improvement Plan. The Plan includes several planned actions for the UC-R environment in Reach 8D. These actions include redevelopment of several public parks into public beach parks. As identified in the *Shoreline Restoration Plan* (Appendix A of the SMP), several opportunities for improvements to shoreline ecological functions exist: • Restoration of a 1,200 foot section of shoreline, including shoreline armoring removal, on inner Ediz Hook; • Incorporating LWD into shoreline armoring to retain sediment along the shoreline; • Removing wood waste from the lagoon; • Improving tidal connectivity to the lagoon; and • Riparian planting along the shoreline. Based on planned restoration at the Rayonier site, it is reasonable to assume that substantial upland riparian restoration will occur over all of the Rayonier site east of Ennis Creek.	
Reach 8D (in part)	**Existing Development:** Valley Creek Estuary Park, the vacant Oak Street Property, port terminal 4, Hollywood Beach Park, city pier. **Existing Functions/Processes:** Hydrologic: Heavily altered by fully armored shoreline and piers. Category 2 for Fecal Coliform in segments A, B, and D. Vegetative: Shoreline vegetation is limited to sparse, shrubs and small trees. Habitat: This area provides minimal habitat value.	The Waterfront Trail is likely to remain and possibly be rerouted closer to the water through the Oak Street property. The Victoria Express may move from The Landings Mall to Terminal 4 at the Oak Street property. The Oak Street property will most likely be redeveloped to include a public park and beach on the City-leased Department of Natural Resources portion, and Hollywood Beach will be redesigned and expanded, both per the Waterfront and Transportation Improvement Plan, with possibly more parkland or other fairly intense uses on the privately owned portion. The City Pier may improve transient moorage, and the Feiro Marine Life Center may be upgraded, refurbished to include expanded uses, or relocated. **Functions/Processes Impacted:** Hydrologic and Habitat: The redevelopment of publically owned parks into beach parks will reduce armoring and restore a more natural shoreline gradient in portions of this environment. Vegetative: Vegetation in this reach will likely improve only slightly though park redevelopment and				

Shoreline Segment	Existing Conditions	Likely Development / Functions or Processes Potentially Impacted	Effect of SMP Provisions	Effect of Other Development and Restoration Activities / Programs	Net Effect
		possible mitigation for redevelopment activities, since public access and views are central drivers of the redevelopment plan. Vegetation.			
Reach 9 (in part)	**Existing Development:** This reach contains the Waterfront Trail and Francis Street Park. **Existing Functions/Processes:** The reach is entirely armored, with the trail running along the reach just landward of the armoring. Except for the Francis Street Park, the reach is generally forested landward of the trail.	Francis Street Park is partially located on land zoned for single family residential uses, but its use is not likely to change. **Functions/Processes Impacted:** Functions are not expected to change in this reach.			
Reach 10 (in part) and Reach 11 (in part)	**Existing Development:** The Olympic Discovery Trail runs along the beach in that zone and will most likely remain. **Existing Functions/Processes:** Most, but not all of the shoreline is armored. Upland of the trail, the bluffs are forested. Lees Creek provides habitat for priority fish species.	Land use changes are not expected in this reach. **Functions/Processes Impacted:** Existing functions are not expected to change in this reach.			
Urban Conservancy – Low Intensity (UC-LI)					
Reach 1 (in full)	**Existing Development:** Existing development in this designation consists of a former landfill and current solid waste transfer station. **Existing Functions/Processes:** Hydrologic: Approximately one-third of this segment is impaired by the presence of a seawall installed to prevent the erosion of landfill material into the Strait. Vegetative: Much of this reach is characterized by	**Future Development:** Future development in this environment designation might include a park, golf course, alternative energy site, or other public use with potential access to the beach. In addition, the seawall and contaminated material may be removed. **Functions/Processes Impacted:** Hydrologic: Future development would likely involve minimal impervious cover, and therefore minimal hydrologic impacts. Removal of the seawall would provide a source of sediment and	General management policies for the UC-LI environment (Chapter 2.B.5.c) include: 1. Uses in the "Urban Conservancy–Low Intensity" environment should be limited to those which are non-consumptive (i.e., do not deplete over time) of the shoreline area's physical and biological resources and uses that do not substantially degrade ecological functions or the rural or natural character of the shoreline area. Shoreline habitat restoration and environmental enhancement are preferred uses. 2. Developments and uses that would substantially degrade or permanently deplete habitat or the physical or biological resources of the area should not be allowed. 3. During development and redevelopment, all reasonable efforts should be taken to restore ecological functions. Where feasible, restoration should be required of all non water-dependent development on previously	Any in- or over-water proposals would require review not only by the City of Port Angeles, but also by the Washington Department of Fish and Wildlife (WDFW), the U.S. Army Corps of Engineers (Corps), and/or the Washington Departments of Ecology and Natural Resources. Each of these agencies is charged with regulating and/or protecting shorelines and the waters of Puget Sound, and would impose certain design or mitigation requirements on applicants. A project that includes in-water fill would require Corps review and permitting. For similar projects along the Puget Sound, a Biological Evaluation would be prepared to assess project impacts on listed fish and wildlife, and that document	Similar to the UC-R environment, much of the anticipated development in the UC-LI environment is associated with the development or expansion of recreational uses. Since the SMP requires that the development of recreational uses consider restoration opportunities, priority restoration projects identified in the Shoreline Restoration Report are likely to be implemented in this environment.

Shoreline Segment	Existing Conditions	Likely Development / Functions or Processes Potentially Impacted	Effect of SMP Provisions	Effect of Other Development and Restoration Activities / Programs	Net Effect
	sparse vegetation. While some of the reach has a relatively wide vegetated buffer area, most of the shoreline is limited in shoreline vegetation. Habitat: Reach includes documented use by several aquatic priority species. Bluffs also a priority habitat. Dry Creek is relatively steep and provides little estuary habitat.	other organic inputs, and may restore natural sediment movement patterns. Removal of contaminated material could improve water quality. Overall, an improvement in hydrologic function could be anticipated. Vegetative: Future development at the top the bluffs would likely include an improved vegetative buffer. A project to remove the seawall would likely include a revegetation component. Habitat: Would likely be increased and improved due to an increased vegetated buffer at the top of the bluffs and/or revegetation at the toe of the bluffs. Removal of the seawall would likely improve beach habitat. Any public access project should be planned and designed to minimize habitat impacts.	developed shorelines. 4. Construction of new structural shoreline stabilization and flood control works should not be allowed except where there is a documented need to protect public safety or ecological functions and mitigation is applied. New development should be designed and located to preclude the need for structural shoreline stabilization or flood control during the projected lifetime of the development. 5. Activities or uses that would remove shoreline vegetation, cause substantial erosion or sedimentation, or adversely affect wildlife or aquatic life should not be allowed. The VCA and setback requirements for reaches 1 and 2 (SMP Segment A) are 200 feet from OWHM (Chapter 2.C). Utilities and ecological enhancement are allowed within the setback areas, Shoreline stabilization measures are only allowed for utilities or ecological restoration. VCA and setbacks for wetlands (found in Section 3.B.3) are applicable in reach 7 (SMP Segment G). Chapter 3.B.12.c of the SMP provides that minor vegetation removal may be done for parks, public access, and trails on public property provided impacts are mitigated. If provisions of the Environmentally Sensitive Areas Protection regulations and other parts of the SMP conflict, the provisions most protective of the ecological resource shall apply, as determined by the City (Chapter 3.B.3.c).	would be routed to U.S. Fish and Wildlife Service and National Marine Fisheries Service for Endangered Species Act review. These agencies would also impose certain design and mitigation requirements on a proposed project to minimize adverse impacts. The City's Sensitive Areas regulations require wetland buffers varying between 25 and 300 feet based on wetland classification and intensity of proposed land use (PA 15.20). Marine bluffs have a buffer of 50 feet from the top and toe. As identified in the *Shoreline Restoration Plan* (Appendix A of the SMP), several opportunities for improvements to shoreline ecological functions exist; these include: • Improving habitat conditions in Dry Creek; • Limiting influence of landfill on shoreline; • Evaluating rerouting industrial water supply line; • Improving riparian vegetation; • Enhancing tidal connectivity to the lagoon; and • Mitigating the effects of armoring by incorporating LWD or through beach nourishment.	Furthermore, strict VCA and setback requirements apply to the UC-LI environment, such development other than public access, trails, or parks will be outside of shoreline jurisdiction. Overall, SMP regulations, and state and federal requirements will limit the impacts of development along the UC-LI environment. Proposed restoration projects and restoration of vegetation and habitat in association with development of recreational or public access facilities is likely to result in **no net loss or an improvement in shoreline ecosystem function**.
Reach 2 (in part)	**Existing Development:** Ocean View cemetery occupies this reach. **Existing Functions/Processes:** Hydrologic: Hydrologic functions/process impaired by fully armored shoreline. No known water quality impairments. Vegetative: The low bluffs here are highly vegetated. However, the armoring separates the vegetation from the shoreline and limits functions/processes. Habitat: Bluffs considered priority habitat. Shoreline area red sea urchin priority habitat.	**Future Development:** Cemetery expected to remain. Switchback trails to provide improved access to the beach may be provided. **Functions/Processes Impacted:** Any changes to functions from the development of switchback trails would be very minor, and any impacts would be mitigated.			

Shoreline Segment	Existing Conditions	Likely Development / Functions or Processes Potentially Impacted	Effect of SMP Provisions	Effect of Other Development and Restoration Activities / Programs	Net Effect
Reach 7 (in part)	**Existing Development:** This area consists of a potentially associated wetland. Surroundings highly vegetated. **Existing Functions/Processes:** Hydrologic, vegetative, and habitat functions are high in this wetland area.	**Future Development:** There is potential for restoration of the lagoon and a new public access corridor connecting the eastern shore of Ediz Hook to the western beach around the south edge of the lagoon. **Functions/Processes Impacted:** If restoration and public access are pursued, water quality and habitat functions are expected to improve in this reach.			
Shoreline Residential (SR)					
Reach 2 (in part)	**Existing Development:** In the western designation, an armored water line runs along the base of the bluff. Atop the bluff, this area consists of single-family and mobile home uses. Current residences are set back from the OHWM approximately 200 feet, so the buildings are typically just outside of the shoreline jurisdiction. However, the buildings range between 35' and 100' from the top of the bluff, with most of them less than 70' from the top of the bluff. **Existing Functions/Processes:** Hydrologic: Sediment transport is significantly impaired in this reach, particularly due to the loss of sediment supply from the bluffs now protected by the water line and armoring. Vegetative: While a few places along the shoreline have several hundred feet of vegetated width, the segment is dominated by areas with one or two individual trees making up the vegetated buffer. Residential development above the bluff has led to the removal of	**Future Development:** New residential development is expected. There is also potential for structure expansion or renovation. Given proposed SMP regulations, the VCA would generally extend from the bluff top to the outer limits of shoreline jurisdiction. It is assumed that the setback requirement would extend beyond the VCA, and that residential development would generally be limited to outside shoreline jurisdiction; exceptions may occur on five parcels on the eastern end of the reach where the bluff and bluff top are less distinct. These five parcels are presently developed with existing structures outside of shoreline jurisdiction; therefore, the likelihood of redevelopment in shoreline jurisdiction is low. **Functions/Processes Impacted:** Hydrologic: Future development could conflict with functions/ processes provided by the bluffs in this segment. Continued development would result in additional impervious surface coverage. Vegetative: Potential exists for the continued removal of vegetation at residential locations. However clearing could only occur beyond 75 feet from the top of bluff.	General management policies for the SR environment (Chapter 2.B.7.c) include: 1. Minimum frontage width standards in the Shoreline Residential Environment should be set to protect the shoreline ecological functions, taking into account the environmental limitations and sensitivity of the shoreline area, the level of infrastructure and services available, and other comprehensive planning considerations. 2. Development standards for setbacks or buffers, shoreline stabilization, vegetation conservation, critical area protection, and water quality should be established to protect and, where significant ecological degradation has occurred, restore ecological functions over time. 4. Standards for new residential development should protect human safety and ensure that new development will not require structural shoreline stabilization or flood protection during the projected lifetime of the development. In reach 7 (SMP Segment F), the setback and VCA cover all of shoreline jurisdiction. The minimum VCA is 75 feet from the top of bluff for Reach 2 (SMP Segment B) and 60 feet from the top of bluff for Reach 11 (SMP Segment P) (Chapter 2.C). Furthermore, setback standards apply based on geologically hazardous area regulations (Chapter 3.B.5.c): 1. Applicants proposing development adjacent to a marine bluff with a slope greater than 45 degrees vertical to horizontal and a height greater than 10 feet from the toe of the slope shall submit a geotechnical engineering report, prepared in accordance with the requirements of this SMP and the shoreline-specific Environmentally Sensitive Areas Protection regulations when development is proposed within 200 feet from the OHWM. The geotechnical engineering report shall be prepared by a Washington State licensed professional civil engineer with a specialty in geotechnical engineering or an engineering geologist with a Washington specialty	The City has developed an ordinance addressing runoff from new development, redevelopment, and construction activities at sites one acre or greater in size. The City may reduce the size threshold in the future. Actions include employing Ecology's manual for design criteria and best management practices, conducting stormwater plan review and oversight, pre- and post-construction site inspection, and compliance and maintenance standards for stormwater discharge. The City's Sensitive Areas regulations require wetland buffers varying between 25 and 300 feet based on wetland classification and intensity of proposed land use (PAMC 15.20). Marine bluffs have a buffer of 50 feet from the top and toe. The Washington Department of Fish and Wildlife also specifies permit conditions to develop within a bald eagle buffer area. As identified in the *Shoreline Restoration Plan* (Appendix A of the SMP), several opportunities for improvements to shoreline ecological functions exist; these include: • Improving vegetation at the top and toe of the bluff; • Evaluating the feasibility of rerouting the water supply line to allow for natural bluff erosion; • Mitigating the effects of armoring by incorporating LWD or through beach nourishment; and • Improving habitat conditions in Lees	Vegetation Conservation Areas and structural setback standards are such that new development and redevelopment will be setback further than average existing conditions, and will generally fall outside of shoreline jurisdiction. Impacts to bluff stability and erosion rates should be minimal to absent because of strict standards for geologically hazardous areas. Stormwater management regulations should minimize impacts from additional impervious surfaces within and adjacent to shoreline jurisdiction. Restoration opportunities could improve natural bluff erosion processes and natural beach accretion. SMP provisions, together with other City plans and regulations should limit development within shoreline jurisdiction and minimize effects of any development to **maintain existing shoreline functions.**

Shoreline Segment	Existing Conditions	Likely Development / Functions or Processes Potentially Impacted	Effect of SMP Provisions	Effect of Other Development and Restoration Activities / Programs	Net Effect
	vegetation in places. Interaction of vegetation with the shoreline is limited due to the bluff and armoring. Habitat: Documented use by several WDFW priority species, including abalone, red sea urchin, and bald eagle (nest and buffer). Bluffs are also considered a priority habitat.	Habitat: Development would not be expected to markedly affect existing habitat, as priority habitat is generally below the bluff, and regulations prohibit development that would require stabilization or affect erosion rates.	license in engineering geology as specified in RCW 18.220. The report shall be based upon the best available science, existing and proposed uses, risks of slope failure, and coastal erosion rates over at least 75 years. The report shall be professionally stamped and include the certification that the structure will not be in danger from erosion for at least 75 years. The report shall recommend a marine bluff setback at least equal to the annual erosion rate times 75 years plus 20 feet. All proposed development on a marine bluff or in the required setback shall be prohibited, except minor development to provide public access (e.g., public trails, stairs, or view points), provided that impacts are mitigated and the development can be shown to be safe. 2. All habitable structures shall be set back from the top of the bluff so that the structure is not threatened by erosion for at least 75 years or the life of the building, whichever is longer. Additionally, habitable structures shall be set back t least the minimum distance noted in Section 2.C. 3. Surface drainage shall be directed away from marine bluffs. When no other solution is feasible, surface drainage piping may be located on the face of a steep slope when contained in a tight line (closed, non-leaking pipe) and in such a way that erosion will not be exacerbated at the base of the bluff and that physical access along the shoreline is not degraded. Furthermore, conditions may be applied to mitigate for aesthetic or habitat impacts of drainage systems as viewed from public areas. Residential Development Use Regulations (Ch.5.B.8.c): 1. Residential development shall not be approved where shoreline stabilization measures, bluff walls, or bulkheading will be required to protect residential structures, lots, or site area. Residential development shall be located and designed to avoid the need for structural shore defense and flood protection works for the life of the development. 2. Prior to issuance of a building permit, plat or short plat or other shoreline development approval, the developer shall submit adequate plans for preservation of shore vegetation and for control of erosion during and after construction. Such plans shall be a part of the shoreline permit, if one is required. 6. No accessory structure except swimming pools shall cover more than 150 square feet within shoreline jurisdiction or the required setback. Overwater structures are not allowed in the shoreline residential environment (Ch. 4.B.3.c). Further discussions of residential use, shoreline armoring, and overwater structure policies and regulations are provided in Section 5, below.	Creek.	
Reach 7 (in part)	**<u>Existing Development</u>:** Consists of four single-family residential parcels above the bluff.	**<u>Future Development</u>:** All parcels currently have structures. Future development would consist of structure renovation, expansion, or replacement. Development below the bluff is highly unlikely. **<u>Functions/Processes Impacted</u>:** Hydrologic: Little change in impervious surface coverage or hydrologic conditions is expected. Vegetative: Clearing should be limited, although some clearing of vegetation for views could occur. Habitat: Little change in habitat quality or availability is expected in this reach.			
Reach 11 (in part)	**<u>Existing Development</u>:** The eastern portion of this area consists of single-family residential parcels; however, very few structures are within shoreline jurisdiction. The distance between the buildings in these parcels and the top of the bluff varies widely from approximately 35 feet to almost 200 feet. All but two parcels are separated from the shoreline by the Urban Conservancy-Recreation environment.	**<u>Future Development</u>:** New residential development is expected, either on existing vacant parcels or parcels to be subdivided in the future. There is also potential for structure expansion or renovation. Given proposed SMP regulations, the VCA would generally extend from the bluff top to the outer limits of shoreline jurisdiction. It is assumed that the setback requirement would extend to or beyond the VCA, and that residential development would generally be limited to outside shoreline jurisdiction. **<u>Functions/Processes Impacted</u>:**			

Shoreline Segment	Existing Conditions	Likely Development / Functions or Processes Potentially Impacted	Effect of SMP Provisions	Effect of Other Development and Restoration Activities / Programs	Net Effect
		Hydrologic: Little change in impervious surface coverage or hydrologic conditions is expected. Vegetative: Clearing should be limited, although some clearing of vegetation for views could occur. Habitat: Little change in habitat quality or availability is expected in this reach.			

5 DEVELOPMENT IMPLICATIONS

In addition to the general cumulative impacts analysis presented in the table above, this section below will expand on three specific key areas related to direct affect on functions that can be assessed through more quantitative means. These include issues related to Shoreline Residential development (i.e. setbacks and development potential), overwater structures (quantity, size, and new potential), and shoreline armoring (extent of new, repaired, or modified structures).

5.1 Shoreline Residential

With the possible exception of limited additional residential-zoned lands being acquired for public open space, planned land use in the Shoreline Residential environment is not expected to change over the next 20 years, although new residential development and substantial remodels are anticipated. Typically, development of vacant lots into residential uses would result in replacement of pervious, vegetated areas with impervious surfaces and a landscape management regime that often includes chemical treatments of lawn and landscaping. These actions can have multiple effects on shoreline ecological functions, including:

- Reduction in ability of site to improve quality of waters passing through the untreated vegetation and healthy soils.
- Potential contamination of surface water from chemical and nutrient applications.
- Increase in surface water runoff due to reduced infiltration area and increased impervious surfaces, which can lead to excessive soil erosion and subsequent in-water sediment deposition.
- Elimination of upland habitat occupied by wildlife that use riparian areas.

Residential Development Use Policies (Ch.5.B.8.b) establish that the overall density of development, lot coverage, and height of structures should be appropriate to the physical capabilities of the site and consistent with the comprehensive plan. The comprehensive plan designates residential shoreline land in Reaches 2 & 7 as low density residential, which allows up to 7 units per acre, and zoning varies between 7,000 to 11,000 square foot minimum lot sizes. Residential land use for the Urban Growth Area (Reach 11) is zoned Urban Low Density (4,840 sf lot) and Urban Very Low Density (12,500 sf lot) by Clallam County. These designations could allow for substantial subdivision of existing shoreline parcels; however, vegetation would be retained within shoreline

jurisdiction based on Vegetation Conservation Area (VCA) requirements, and presumably, structural setbacks would be greater than the VCA, and would be built outside of shoreline jurisdiction.

Other policies pertinent to shoreline residential development include, 1) providing for adequate setbacks or open space from the water to provide space for public access, views, and to protect or restore ecological functions and processes; 2) recognizing the inevitability and ecological importance of bluff erosion, and provide for setbacks that avoid shoreline stabilization structures (such as bulkheads or bluff walls), significant erosion or slope instability, and the removal of native vegetation that helps to prevent bluff erosion; and 3) encouraging clustering of dwelling units in order to preserve natural features, minimize physical impacts, and reduce utility and road costs.

According to the City's GIS data, the number or residential parcels within shoreline jurisdiction for each residential reach is listed in Table 5. This table identifies structures within and outside of shoreline jurisdiction, as well as vacant parcels. The analysis indicates that structures are located outside of shoreline jurisdiction for half of all residential parcels within shoreline jurisdiction, and only 15% of the shoreline residential parcels have structures within shoreline jurisdiction.

Table 5. Development in Shoreline Residential by reach.

	Reach 2	Reach 7	Reach 11	Total
Total number of parcels intersecting shoreline jurisdiction	53	5	78	136
Number of parcels with structure in shoreline jurisdiction	19[1]	0	1[2]	20
Number of parcels with structure outside of shoreline jurisdiction	16	5	47	68
Number of undeveloped parcels	18	0	30	48

[1] In Reach 2, for those lots with structures within shoreline jurisdiction, structure setbacks from OHWM range from 157 to 200 feet. One lot has an accessory structure located 64 feet from OHWM, but nearly all structures are setback at least 150 feet.

[2] In Reach 11, only one parcel contains a structure within shoreline jurisdiction and it is 185 feet landward of OHWM.

The amount of space between the shoreline and a structure is an excellent quick evaluation of shoreline condition; furthermore, many residential properties in Port Angeles are located above a bluff, and the proximity to the bluff, the extent of native vegetation, and the amount of impervious surfaces are often even more precise indicators of the effects on shoreline function than the overall structure setback since these factors contribute to the rate of bluff erosion and sediment delivery to the nearshore. The City's SMP accounts for the significance of setbacks from the bluff and vegetation conservation through setbacks based on geotechnical analyses and Vegetation Conservation Areas (VCAs) of 75 feet beyond the top of bluff in Reach 2, 60 feet from the top of bluff in Reach 11, and 200 feet from the OHWM in Reach 7. These VCAs are generally greater than average existing setbacks, and for all but a few parcels on the eastern portion of Reach 2, these VCAs extend to or beyond the landward edge of shoreline jurisdiction. These regulations promote the conservation and continued development of vegetative functions within shoreline jurisdiction. Typically, shoreline setbacks in conjunction with revegetation standards are an excellent means to improve overall shoreline ecological functions in developed areas.

The amount of impervious surface coverage is less significant along a marine shoreline environment where water quantity is less of a factor than in more confined water bodies like streams and rivers. Furthermore, single-family or multi-family homes generally have clean roof and sidewalk runoff. Driveways are typically pollution-generating surfaces only to the extent that vehicle-related pollutants are deposited on them. The City has not established impervious surface coverage standards for residential development, but encourages development to reduce impervious surfaces through water quality regulations **(Chapter 3.B.14)**.

As noted above, VCAs extend over the entire structural setback distance for virtually all of the residential reaches. Vegetation conservation standards for clearing and grading within shoreline jurisdiction include limiting clearing within the VCA, mitigating for any clearing following mitigation sequencing, and revegetating cleared areas with native plants **(Chapter 3.B.13)**. Where shoreline restoration is required, property owners must prepare and adhere to a vegetation management and maintenance plan.

It is important that the impervious surfaces be separated from the waterbody to the extent that those surfaces replace vegetation, which can have a variety of ecological benefits. The setback provisions described above continue to maintain separation between the homes and the water, leaving the nearshore area available for vegetation. Relative to the existing conditions in the Shoreline Residential environment, the implementation of 60-foot, 75-foot and 200-foot setbacks (depending on reach location), vegetation conservation, and

revegetation standards will likely result in improvements to ecological functions over time (benefiting terrestrial and aquatic species).

In summary, new residences and substantial remodels/additions are expected in the Shoreline Residential environment over the next 20 years. The protective setbacks, VCAs, and other measures in the SMP, will maintain or improve ecological functions of the shoreline over the long term, thereby resulting in no net loss of shoreline ecological function within the environment.

5.2 Overwater Structures

The term overwater structures, as used here, includes both overwater and in-water structures. Common overwater structures in Port Angeles include piers and floating docks. Less common overwater structures in Port Angeles include boathouses and floating net pens. All overwater structures are located within Port Angeles Harbor and no overwater structures are directly associated with single-family residential uses.

Piers, docks, and other overwater structures can adversely affect ecological functions and habitat in the following ways:

- Alter patterns of light transmission to the water column, affecting macrophyte growth and altering habitat for and behavior of aquatic organisms, including juvenile salmon.
- Interfere with long-shore movement of sediments, altering substrate composition and development.
- Contribute to contamination of surface water from chemical treatments of structural materials.
- Floating net pens and associated aquaculture practices pose concerns for water quality and benthic habitat conditions. Any new or expanded net pens would require a conditional use permit.

Currently, overwater structure coverage in the harbor is 29.5 acres. Expansion of overwater structures (associated with marina expansion, dock extension at the Landing Mall, and the creation of overwater viewing areas) is expected in the HI-M and HI-MU environments. In other cases, the redevelopment of overwater structures is anticipated (e.g., ferry pier redevelopment). New overwater structures are not allowed in the Shoreline Residential environment. The SMP limits overwater coverage in the first 30 feet from OHWM to piers and ramps **(Chapter 4.B.3.c)**. Although the SMP does not provide specific dimensional criteria for new or redeveloped overwater structures, it does require that pier and dock "length must be the minimum necessary to support the intended use."

Skirting is prohibited except to contain or protect flotation material in order to minimize interference with light transmission and fish migration. The SMP also limits lighting and materials to minimize impacts to ecological functions.

Mitigation measures for overwater structures encouraged by the Washington Department of Fish and Wildlife (WDFW) includes the installation of grated decking, removal of unused piles (especially those formerly treated with creosote), reduction of pile size and quantity on modified structures, and general reduction in overall square footage of cover. Any new or replacement structure would require a Hydraulic Project Approval (HPA) from WDFW and a Section 10 Rivers and Harbors Act permit from the Corps of Engineers. Because of the presence of listed salmonids, a Corps permit would also entail consultation with the National Marine Fisheries Service to comply with the Endangered Species Act. These agencies would likely require similar mitigation measures noted above for WDFW.

Although expansion, reconfiguration, and repair of several overwater structures is expected, the removal of some existing overwater structures is also anticipated. Rayonier and the LEKT have developed conceptual plans for the removal of derelict structures, including the 200,000 square-foot pier, at the Rayonier site, which will substantially reduce or eliminate the 5.2 acres of overwater coverage in Reach 10. The existing structure is supported by an estimated 10,000 creosote piles. Overall, the overwater structure coverage that will be removed as a part of the Rayonier site restoration is expected to be far greater than the combined coverage of any new proposed overwater coverage, including any replacement structure located at the former Rayonier mill site. Furthermore, new structures will need to minimize overwater coverage dimensions, eliminate skirting, and comply with HPA requirements.

The combined effects of the City's proposed SMP, planned restoration, and permit review by WDFW and the Army Corps of Engineers is expected to result in a reduction of shoreline impacts from overwater structures over time.

5.3 Shoreline Stabilization

Presently, over 94% of the City's shoreline jurisdiction is armored by some type of shoreline stabilization, including bulkheads, seawalls, breakwaters, jetties, and groins. New shoreline armoring typically has the following effects on ecological functions:

- Reduction in nearshore habitat quality for both aquatic and terrestrial species. Specifically, shoreline complexity and emergent vegetation that provide forage and cover may be reduced or eliminated. Elimination of shallow-water habitat, including eelgrass and other vegetation, may also increase vulnerability of juvenile salmonids to aquatic predators.

- Reduction of natural sediment recruitment from the shoreline. This recruitment is necessary to replenish substrate and preserve shallow water conditions.

- Increase in wave energy at the shoreline if shallow water is eliminated, resulting in increased nearshore turbulence that can be disruptive to aquatic resources.

The SMP sets standards for new and repaired shoreline armoring, as well as conditions and uses where new shoreline armoring is allowed or prohibited **(Chapter 4.B.2)**. The proposed SMP establishes a preference for non-structural stabilization measures over structural measures. Structural shoreline stabilization measures with less adverse impact on natural functions, such as bioengineering, are strongly preferred over hard structural shoreline stabilization measures, such as seawalls and bulkheads.

Under the proposed SMP, new shoreline stabilization is not allowed unless it is proven to be necessary to protect an existing structure or new water dependent development. New or expanded armoring is not permitted for new non-water dependent structures unless the structure cannot be sited or designed in such a way to eliminate the need for new armoring, and it is demonstrated that the armoring will not result in a net loss of shoreline function. New armoring may also be permitted for existing structures, only if geotechnical analysis completed by a licensed geotechnical engineer or related licensed professional indicates that the structure is in danger because of erosion caused by currents, waves, or boat wakes, and furthermore, that the armoring will not impair fluvial hydrological or geomorphologic processes. Where stabilization is deemed necessary, the size of the structure must be the minimum necessary to achieve necessary stabilization. Replacement bulkheads may also be permitted if there is a demonstrated need to protect structures provided that these structures minimize harm to ecological functions and are not constructed waterward of existing bulkheads, although a geotechnical analysis is not needed in these cases. Replacement structures may be built waterward of the existing bulkhead (if within their existing footprint), but only far enough to accommodate new footings.

The SMP specifies that shoreline stabilization that incorporates shoreline restoration is permitted, but it does not require or state a preference for such approaches. On the other hand, mitigation of adverse impacts is required of new or expanded armoring.

The Army Corps of Engineers and WDFW have jurisdiction over new shoreline stabilization projects, and repairs or modifications to existing shoreline stabilization. As part of their efforts to minimize and compensate for shoreline stabilization-related impacts, both agencies encourage implementation of native

shoreline enhancement for new shoreline stabilization projects. Further, they also strongly promote shoreline restoration and additional impact compensation measures for many shoreline armoring modification projects, including placement of gravel at the toe of the armoring to create shallow-water habitat, angling the armored face landward to reduce wave turbulence, and shifting the armoring as far landward as feasible.

Based on an evaluation of the City's GIS data, the majority of the City's shoreline is already armored (over 94%). Therefore, the need for new shoreline stabilization is expected to be limited to none. On the other hand, given the abundance of armoring structures in the City, the need for repair and replacement armoring is likely more substantial. As mentioned above, bulkhead repair and replacement is only permitted where there is a need to protect existing development from damage due to erosion caused by natural processes, such as currents, waves, or boat wakes. Furthermore, given the stated preference for non-structural and bioengineered stabilization, the ecological impacts of stabilization may decline as bulkheads are replaced.

Several projects anticipated through the recently adopted Waterfront Transportation Improvement Plan and the planned restoration of the Rayonier site include the restoration of armored shorelines. The Waterfront Transportation Improvement Plan includes the redevelopment of City Pier Park and Hollywood Beach. Redevelopment of this one park would include the removal of existing shoreline armoring to reestablish a more natural beach gradient and provide improved recreational access to the shoreline. The Oak Street property at the west end of the project area will be developed into a new park with a beach construction component. The conceptual plan for the Rayonier site restoration, prepared through a partnership between Rayonier and the LEKT, includes the removal of the existing large pier and jetty structures. Removal of the over 600-foot-long jetty could require some new stabilization measures for the resulting beach; regardless, removal of the existing jetty will offer significant progress toward restoring the natural currents and hydrologic processes to the City's nearshore area. Together, these projects will help reduce the cumulative ecological effects of shoreline armoring on ecological functions within the City.

Finally, the removal of the Elwha Dam is expected to provide re-nourishment of outer Ediz Hook, potentially covering over 3 miles of exposed armoring. Future restoration of this stretch of shoreline may include the installation of large woody debris, rocks, and vegetation aimed at collecting some of the sediment drift expected to move along the shoreline.

Over time, the combined effects of the City's proposed SMP, implementation of the Shoreline Restoration Plan, permit reviews from the WDFW and the Corps,

and planned restoration actions are expected to result in a reduction over time of the net amount of hardened shoreline at the ordinary high water mark, a reduction in the effects of armoring on hydrologic and geomorphic processes, and an increase in shallow-water habitat within the Shoreline Residential environment.

NET EFFECT ON ECOLOGICAL FUNCTION

On its own, the proposed SMP, which includes the Shoreline Restoration Plan, is expected to protect shorelines within the City of Port Angeles while accommodating reasonable foreseeable future shoreline development that results in, at a minimum, no net loss of shoreline ecological function. State and federal regulations, acting in concert with this SMP, will provide further assurances of maintaining shoreline ecological functions over time.

As discussed above, major elements of the SMP that ensure no net loss of ecological functions fall into generally five categories: 1) environment designations (Chapter 2), 2) general provisions (Chapter 3), 3) shoreline modification provisions (Chapter 4), 4) shoreline use provisions (Chapter 5), and 5) Shoreline Restoration Plan (Appendix A).

Environment designations: The *Final Shoreline Analysis Report* provided the information necessary to assign environment designations along the Puget Sound shorelines (see **Chapter 2** of SMP). Shoreline uses and modifications were then individually determined to be either permitted (as substantial developments or conditional uses) or prohibited in each of those environment designations. The most uses and modifications are allowed in descending order of potential impact in the High Intensity Industrial, High Intensity Marine, High Intensity Urban Uplands, High Intensity Mixed-Use, Urban Conservancy Low Intensity, Urban Conservancy Recreation, and Shoreline Residential environments.

General provisions: **Chapter 3** of the SMP contains a number of regulations on a variety of topics that contribute to protection and restoration of ecological functions, including **Chapter 3.B.3 and 3.B.4** (Critical areas and Critical saltwater habitats), **Chapter 3.B.5** (Geologically Hazardous Areas), **Chapter 3.B.6** (Environmental Impacts), **Chapter 3.B.13** (Vegetation Conservation), and **Chapter 3.B.14** (Water Quality and Quantity).

Shoreline modification provisions: **Chapter 4** contains a number of regulations on a variety of topics that contribute to protection and restoration of ecological functions, including **Chapter 4.B.2** (Shoreline stabilization)**, Chapter 4.B.3**

(Overwater structures)**, Chapter 4.B.6** (Shoreline restoration)**, and Chapter 4.B.7** (Dikes and levees). All of these shoreline modification regulations emphasize minimization of size of structures, use of designs that minimize impacts to shoreline functions, and mitigation sequencing to avoid degradation of shoreline functions.

Shoreline use provisions: Regulations in **Chapter 5** focus on exclusion of uses that are incompatible with the existing land use and ecological conditions, and emphasize appropriate location and design of the various uses. These regulations also emphasize avoidance and minimization of ecological impacts via appropriate setbacks, protection and enhancement of vegetation, and use of innovative designs (such as LID techniques) that do not degrade and may even enhance shoreline functions. These factors are balanced with water-dependent uses that are essential to the City's waterfront use and development, primarily in the High Intensity environments, where these uses are recognized for their economic benefit and social value. While allowing water-dependent uses and developments to continue along the shoreline, the proposed SMP emphasizes protection and enhancement of shoreline resources such that no net loss of ecological functions will be achieved over time.

Shoreline Restoration Plan: The *Shoreline Restoration Plan* identifies a number of planned and ongoing restoration projects, as well as more conceptual project-specific opportunities for restoration on both public and private properties inside and outside of shoreline jurisdiction. The Plan also identifies ongoing City programs and activities, non-governmental organization programs and activities, and other recommended actions consistent with a variety of watershed-level efforts. *The City is an active proponent for restoration along the City's shorelines.*

Summary: The following are some of the key features identified in the proposed SMP and this evaluation which protect and enhance shoreline ecological functions.

- Much of the shoreline is highly developed, and expected new development is limited. Regulations associated with redevelopment of existing degraded shorelines will likely help improve overall shoreline functions.

- Vegetation conservation areas and structural setbacks throughout the City are based on environment designation and existing conditions. Larger setbacks are required in areas with a higher need for protection of shoreline resources.

- Any projects with potential for significant adverse ecological effects will need to follow mitigation sequencing to avoid, minimize and mitigate any impacts.

- Contaminant cleanup at the Rayonier site will improve water and sediment quality. The planned removal of approximately 5 acres of overwater structure and a large jetty, as well as restoration of floodplain function at the mouth of Ennis Creek will substantially improve shoreline habitat and restore natural shoreline processes.

- Planned redevelopment associated with the City's recently adopted Waterfront Transportation Improvement Plan will replace armoring with an unarmored beach at City Pier Park and Hollywood Beach but also create a beach component at the currently armored but undeveloped Oak Street property. This will improve sediment transport processes and restore shallow water shoreline habitat in the City's core.

- Removal of the Elwha dam will restore a natural sediment source and improve sediment processes and shoreline habitat on Ediz Hook. Restoration on the inner portion of Ediz Hook will reduce shoreline armoring and use bioengineering approaches, including LWD and native vegetation, to ensure shoreline stability. Together, these restoration efforts will greatly enhance the overall shoreline ecosystem functions on Ediz Hook.

- Emphasis on achieving no net loss of shoreline ecological functions throughout shoreline jurisdiction, including development of water-dependent uses.

Given the above provisions of the SMP, including implementation of the *Shoreline Restoration Plan* and the key features listed above, implementation of the proposed SMP is anticipated to achieve **no net loss of ecological functions in the City of Port Angeles' shorelines**.