

CUMULATIVE IMPACTS ANALYSIS

of Skagit County's Shoreline Master Program

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CUMULATIVE IMPACTS ANALYSIS

SKAGIT COUNTY SHORELINE MASTER PROGRAM

1 INTRODUCTION

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

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

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

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

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

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

- (i) current circumstances affecting the shorelines and relevant natural processes [Chapter 3 below and Shoreline Analysis Report];
- (ii) reasonably foreseeable future development and use of the shoreline [Chapter 4 below and Shoreline Analysis Report]; and
- (iii) beneficial effects of any established regulatory programs under other local, state, and federal laws.” [Chapters 5 and 6 below]

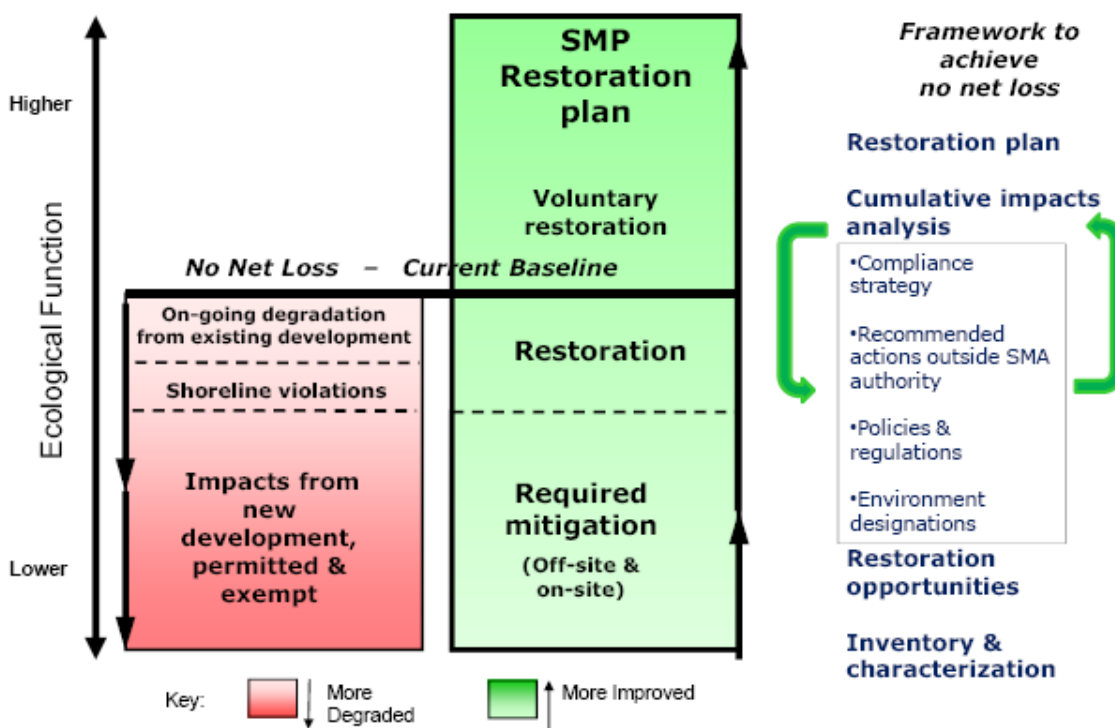


Figure 1-1. Diagram of evaluation of cumulative effects on shoreline ecological functions. Source: Department of Ecology

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

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

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

2 METHODOLOGY

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

2.1 Future Development

2.1.1 Land Capacity

A land capacity analysis was conducted to gauge the potential level of development that may occur in the future along shorelines given adopted Comprehensive Plan land use designations.

The land capacity analysis was conducted as part of the Shoreline Analysis Report (TWC 2014), and is summarized in this report.

As part of the Envision Skagit 2060 planning effort, Skagit County developed a long-range land capacity analysis. Available data from this effort, and assumptions consistent with this effort, were used in this CIA to the extent possible. Two analyses were conducted for land capacity: one for the rural lands, and one for land within urban growth areas (UGAs). The method to determine shoreline land capacity for rural and urban land is summarized below.

It is important to note that this analysis is intended to give an overall picture of the potential for development along shorelines, but is not an exact predictor of which parcels may develop or redevelop. In addition, the analysis does not predict a rate of development.

Both Rural and Urban Land

The analysis included parcels within or intersecting shoreline jurisdiction. The parcel was included whether the entire parcel was within the shoreline jurisdiction, or just a part of the parcel was included in the shoreline jurisdiction. Therefore, the land capacity output overestimates potential development within the County's shorelines, particularly in areas with large lots that extend well outside of shoreline jurisdiction.

Skagit County calculates land development potential on a gross acreage basis, which does not account for development constraints due to infrastructure or environmentally critical areas. As a result, these factors were generally not removed from land capacity calculations. However, land within the floodway was removed from the calculation in recognition of the development constraints of that environmentally sensitive area. It should be noted that some of those properties could potentially still be allowed to transfer development rights out of the floodway or develop on any portions of the property outside of the floodway.

Land designated for conservation, whether publicly or privately owned, was excluded from the analysis of development potential because future development or redevelopment on these lands is unlikely.

Rural Land

The analysis estimated developable acres by Skagit County zoning designation category, using outputs from the Envision Skagit 2060 model for developable acres in the vacant and redevelopable (partially used/developed) categories. The Envision Skagit 2060 model applies policy and other factors to assess alternative future scenarios for Skagit County. The gross developable acres data that were used for this shoreline land capacity analysis were derived from raw data in the model that do not include the application of policy or other factors influencing future development. The following factors were applied to these raw data for rural land:

- A 25% market factor was applied in the Industrial Forest zone only. The market factor accounts for those property owners with vacant or redevelopable property

- that choose not to develop during the planning timeframe being considered. The 25% figure is similar to that applied for urban areas and in the range of market factor percentages applied in other counties for buildable lands assumptions. The market factor was applied in this zone because maximum densities are applied, and this zone allows a wide range of densities, and generally applies to large land holdings.
- The maximum zoning density for each zone was applied in order to estimate the number of dwelling units for each parcel considered vacant or redevelopable. Existing dwelling units were deducted from development in partially used parcel calculations to arrive at a net increase.

Urban Land

For UGAs not associated with a city (e.g. Swinomish), developable acres were estimated by Skagit County zoning designation category. For UGAs associated with a city (e.g. Anacortes, Burlington, and Mount Vernon UGAs), and in the towns of Lyman and Hamilton, developable acres were estimated by the associated city's planned land use designations. Envision Skagit 2060 model data for gross developable acres in the vacant and redevelopable (partially used/developed) categories were used as a basis for this analysis, with assumptions similar to those for rural lands:

- A 10% deduction was taken for infrastructure such as roads and other infrastructure needed for development. This deduction allows for a more realistic assessment of area of land available for development.
- Market factor reductions, which account for land that may not be available (e.g., owner does not wish to develop), were also included for urban land.
- A maximum density was applied to the net buildable acres for residential development in urban areas to be consistent with the approach taken with rural residential land capacity and the Envision Skagit 2060 model effort in estimating total future dwellings.

2.1.2 Likely Development

Using the land capacity analysis as a basis for understanding where new development could occur, existing conditions and anticipated development were evaluated qualitatively by Management Unit and environment designation. Because of the differences in potential impacts of development between marine, lake, and river/stream shorelines, anticipated development along each of these water types was evaluated separately.

2.2 Likely Effects of Development

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

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

3 SUMMARY OF EXISTING CONDITIONS

The following summary of existing conditions is based on the Shoreline Analysis Report (TWC 2014). The discussion below has been divided into marine and freshwater shorelines, with descriptions of each Management Unit. Management Units include the following, as identified and delineated in the Shoreline Analysis Report:

- 1- Samish Bay
- 2- Samish Island, Padilla Bay, and East side Swinomish Channel
- 3- Swinomish Tribal Reservation
- 4- Fidalgo Island and Other Islands
- 5- Skagit Bay/Delta
- 6- Lower Skagit River- Diking Districts
- 7- Samish River
- 8- Middle Skagit River
- 9- Upper Skagit River
- 10- Nooksack Watershed (WRIA 1)
- 11- Stillaguamish Watershed (WRIA 5)

A summary of Management Unit characteristics is provided in Table 3-1. More detailed information on specific shoreline areas is provided in the Shoreline Analysis Report.

The shoreline area is distributed among four Water Resource Inventory Areas (WRIAs), including the Nooksack, Upper Skagit, Lower Skagit, and Stillaguamish watersheds. Shoreline jurisdiction includes 598 miles of rivers and streams, 53 lakes and reservoirs, and 228 miles of marine and estuarine shoreline. Shoreline functions range from highly impacted to relatively intact. The County's shorelines are primarily used for a range of residential, industrial, and production (forestry and agriculture) uses. Federal lands are included in shoreline jurisdiction, but discussion of uses of federal lands is limited because the proposed SMP will only apply to actions undertaken by non-federal parties on those lands.

Table 3-1. Summary of Shoreline Inventory by Management Unit.

Management Unit	Unit Area (Acres)	Unit Length (Miles)	Inventory Elements							
			Dominant Land Use Patterns	Impervious Surfaces	Vegetation	Armoring (% of shoreline length)*	Overwater Structures (#/shoreline length)	Floodplain, Floodway, and Channel Migration Hazard Area	Open Space/Parks	Critical Areas
Management Unit 1: Samish Bay	498	Marine: 18.9 River/ Stream: 0.2	Comprehensive Plan Zoning: Agricultural NRL:67.6% Secondary Forest NRL: 18.7% Public Open Space: 3.6% Rural Village Residential: 1.7% Small-scale business: 1.2%	2.4%	Cultivated: 29.2% Pasture/Grassland: 19.1% Emergent Wetland: 17.8% Forested (Primarily Evergreen) 14.6% Scrub/Shrub: 6.9% Developed: 5.3%	Marine armoring: 74.3%	Marine: Bridges: 7 Docks: 9 Estuarine/ Riverine: Bridges: 10 Docks: 27	Floodplain: 82% Floodway: NA Channel migration hazard area: 70%	76 acres – 15%	Wetlands: 26.5 acres – 26.5% Steep Slopes: 17.2 acres – 3.4% Priority Habitat Areas: Biodiversity Areas and Corridors: 46.4 acres Cliffs/Bluffs:0.8 acres Estuarine Zone: 10.3 acres Slough: 7.0 acres Waterfowl Concentrations: 60.0 acres Wetlands: 199.9 acres
			Current Land Use: Agriculture: 39.1% Undeveloped Land and Water Areas: 21.0% Not Classified (Water, ROW): 19.6% Single Family Residential: 13.0% Transportation, Communication, and Utilities: 3.8% Trade: 1.8%							
Management Unit 2: Samish Island, Padilla Bay, and East Side of Swinomish Channel	1059	Marine: 33.7 Lake: 1.6	Comprehensive Plan Zoning: Agricultural NRL: 59.2% Rural Reserve: 8.3% Rural Marine Industrial: 1.7 Rural Village Residential: 1.6 Public Open Space: 1.2	3.5%	Cultivated: 30.2% Emergent Wetland: 24.5% Pasture/Grassland: 23.6% Forested (Evergreen and Deciduous) 10.3% Developed: 8.5% Scrub/Shrub: 8.3%	Marine armoring: 68.5%	Marine: Bridges: 6 Docks: 34 Estuarine/ Riverine: Bridges: 5	Floodplain: 86% Floodway: NA Channel migration hazard area: 66%	89 acres (8%)	Wetlands: 318 acres – 30.0% Steep Slopes: 0.03 acres Priority Habitat Areas: Brant: 15.3 acres Estuarine Zone: 29.0 acres Slough: 89.5 acres Waterfowl Concentrations: 59.9 acres Wetlands: 344.4 acres
			Current Land Use: Agriculture: 38.3% Single Family Residential: 19.9% Not Classified (Water, ROW): 17.3% Undeveloped Land and Water Areas: 6.2% Cultural , Entertainment, and Recreational: 5.7% Other Resource Production: 4.2% Transportation, Communication, and Utilities: 2.8% Services: 2.5% Timber/Forestry: 2.2%							

Management Unit	Unit Area (Acres)	Unit Length (Miles)	Inventory Elements							
			Dominant Land Use Patterns	Impervious Surfaces	Vegetation	Armoring (% of shoreline length)*	Overwater Structures (#/shoreline length)	Floodplain, Floodway, and Channel Migration Hazard Area	Open Space/Parks	Critical Areas
Management Unit 3: Swinomish Tribal Reservation	652	Marine: 28.1	Comprehensive Plan Zoning: Residential- Swinomish UGA: 33.9% Public Open Space: 18.6% Agricultural-NRL: 17.0% Rural Reserve: 9.5% Secondary Forest- NRL: 5.5% Commercial- Swinomish UGA: 4.4% Rural Resource- NRL: 4.0%	7.2%	Forested (Evergreen): 32.7% Cultivated: 31.2% Pasture/Grassland: 15.8% Developed: 15.4% Forested (Mixed and Deciduous): 10.0% Emergent Wetland: 9.2% Scrub/Shrub: 4.8%	Marine armoring: 7.9%	Marine: Bridges: 3 Docks: 69	Floodplain: 36% Floodway: NA Channel migration hazard area: 42%	191 acres- 29%	Wetlands: 97.0 Acres—14.9% Steep Slopes: 11.3 acres—1.7% Priority Habitat Areas: Biodiversity Areas and Corridors: 7.1 acres Estuarine Zone: 2.6 acres Harbor Seal: 0.6 acres Islands: 112.9 acres Lagoons: 1.4 acres Waterfowl Concentrations: 24.0 acres Wetlands: 61.4 acres
			Current Land Use: Not Classified (Water, ROW): 37.7% Single Family Residential: 34.0% Undeveloped Land and Water Areas: 18.5% Timber/Forestry: 5.6% Cultural , Entertainment, and Recreational: 2.2%							
Management Unit 4: Fidalgo Island and Other Islands	2,567	Marine: 83.7 Lake: 7.7	Comprehensive Plan Zoning: Rural Reserve: 36.5% Public Open Space: 24.8% Rural Intermediate: 17.9% Anacortes UGA Development District: 9.9% Rural Resource- NRL: 2.4% Commercial- Swinomish UGA: 1.1%	3.5%	Forested (Evergreen): 41.6% Cultivated: 32.2% Forested (Mixed and Deciduous): 11.2% Pasture/Grassland: 10.4% Emergent Wetland: 11.2% Developed: 9.3% Scrub/Shrub: 9.2%	Marine armoring: 9.7%	Marine: Bridges: 8 Docks: 34 Buoys/ Floats: 19 Lake: Docks: 59 Buoys/Floats: 1 Lake- Boat Ramps: 2	Floodplain: 34% Floodway: NA Channel migration hazard area: NA	987 acres- 38%	Wetlands: 674.3 acres—26.3% Steep Slopes: 107.6 acres – 4.2% Priority Habitat Areas: Bald Eagle: 71.0 acres Biodiversity Areas and Corridors: 321.1 acres Brant: 14.2 acres Cavity-nesting Ducks: 38.9 acres Cliffs/Bluffs: 25.2 acres Estuarine Zone: 6.7 acres Harbor Seal: 34.7 acres Islands: 469.5 acres Lagoons: 0.2 acres Old-growth/Mature forest: 199.6 acres Waterfowl Concentrations: 60.2 acres Wetlands: 353.1 acres
			Current Land Use: Single Family Residential: 35.0% Undeveloped Land and Water Areas: 24.1% Not Classified (Water, ROW): 11.1% Cultural , Entertainment, and Recreational: 11.1% Manufacturing: 7.8% Agriculture: 6.0% Timber/Forestry: 5.6%							

Management Unit	Unit Area (Acres)	Unit Length (Miles)	Inventory Elements							
			Dominant Land Use Patterns	Impervious Surfaces	Vegetation	Armoring (% of shoreline length)*	Overwater Structures (#/shoreline length)	Floodplain, Floodway, and Channel Migration Hazard Area	Open Space/Parks	Critical Areas
Management Unit 5: Skagit Bay/Delta	3,743	Marine: 63.7 Estuary/River: 18.4	Comprehensive Plan Zoning: Public Open Space: 57.0% Agricultural- NRL: 28.0% Rural Reserve: 4.2%	0.9%	Emergent Wetland: 48.0%	Estuarine/Riverine: Dikes/Levees: 100% Other Armoring: 1.5%	Marine: Bridges: 2 Docks: 3 Estuarine/Riverine: Bridges: 8 Docks: 12	Floodplain: 97% Floodway: NA Channel migration hazard area: 94%	2196 acres- 59%	Wetlands: 2,885.5 acres—77.1% Steep Slopes: 8.1 acres – 0.2% Priority Habitat Areas: Biodiversity Areas and Corridors: 636.5 acres Estuarine Zone: 175.8 acres Harbor Seal: 23.0 acres Islands: 48.4 acres Sloughs: 43.4 acres Waterfowl Concentrations: 2,432.8 acres Wetlands: 3,287.9 acres
			Current Land Use: Undeveloped Land and Water Areas: 20.9% Agriculture: 20.5% Not Classified (Water, ROW): 19.1% Cultural , Entertainment, and Recreational: 18.0% Services: 12.3% Single Family Residential: 5.2% Other Resource Production: 1.4% Timber/Forestry: 1.2%		Forested wetland: 14.1% Scrub/Shrub Wetland: 13.6% Pasture/Grassland: 8.3% Forested (Evergreen and Deciduous): 3.4% Developed: 1.7%					
Management Unit 6: Lower Skagit Diking District	2,794	River/ Stream: 30.8 Lake: 22.1	Comprehensive Plan Zoning: Agricultural- NRL: 51.2% Rural Resource- NRL: 12.8% Rural Village Residential: 7.0% Rural Reserve: 6.3% Industrial Forest- NRL: 6.3% Secondary Forest- NRL: 5.2%	3.4%	Cultivated: 34.2%	Riverine: Dikes/Levees: 66.4% Other Armoring: 10.7%	Lake: Buoys/ Floats: 3 Docks: 349 Riverine: Bridges: 1 Docks: 1	Floodplain: 75% Floodway: NA Channel migration hazard area: 34%	355 acres- 13%	Wetlands: 1,352.6 acres—48.4% Steep Slopes: 3.2 acres – 0.1% Priority Habitat Areas: Cavity-nesting Ducks: 29.9 acres Islands: 31.3 acres Trumpeter Swam: 449.9 acres Waterfowl Concentrations: 124.4 acres Wetlands: 875.4 acres
			Current Land Use: Agriculture: 35.9% Undeveloped Land and Water Areas: 19.1% Not Classified (Water, ROW): 18.0% Single Family Residential: 10.6% Timber/Forestry: 8.0% Services: 3.0% Transportation, Communication, and Utilities: 1.5% Multi-Family Residential: 1.5% Cultural , Entertainment, and Recreational: 1.3%		Forested (Evergreen and Deciduous) 18.9% Forested Wetland: 18.7% Emergent Wetland: 15.4% Pasture/Grassland: 14.2% Scrub/Shrub wetland: 13.6% Developed: 10.0% Scrub/Shrub: 3.2%					

Management Unit	Unit Area (Acres)	Unit Length (Miles)	Inventory Elements							
			Dominant Land Use Patterns	Impervious Surfaces	Vegetation	Armoring (% of shoreline length)*	Overwater Structures (#/shoreline length)	Floodplain, Floodway, and Channel Migration Hazard Area	Open Space/Parks	Critical Areas
Management Unit 7: Samish River	2,630	River/ Stream: 32.4 Lake: 1.6	Comprehensive Plan Zoning: Agricultural- NRL: 73.3% Rural Reserve: 20.9% Rural Resource- NRL: 3.7%	1.7%	Cultivated: 35.2% Forested (Evergreen and Deciduous) 20.1% Forested Wetland: 18.2% Pasture/Grassland: 16.7% Emergent Wetland: 14.4% Scrub/Shrub wetland: 13.6% Scrub/Shrub: 5.2% Developed: 4.2%	Riverine: 14.5%	Riverine: Bridges:13	Floodplain: 72% Floodway: 27% Channel migration hazard area: 14%	267 acres- 10%	Wetlands: 999.1 acres—38.0% Steep Slopes: NA Priority Habitat Areas: Estuarine Zone: 6.7 acres Waterfowl Concentrations: 47.9 acres Wetlands: 804.7 acres
			Current Land Use: Agriculture: 52.7% Undeveloped Land and Water Areas: 13.6% Single Family Residential: 11.9% Multi-Family Residential: 6.5% Not Classified (Water, ROW): 5.7% Timber/Forestry: 3.4% Other Resource Production: 2.5% Cultural , Entertainment, and Recreational: 1.8%							
Management Unit 8: Middle Skagit River (Including Towns of Lyman and Hamilton)	11,334	River/ Stream: 57.6 Lake: 11.7	Comprehensive Plan Zoning: Agricultural- NRL: 64.6% Industrial Forest-NRL: 9.16% Rural Reserve: 4.2% Incorporated Area: 3.7% Rural Resource- NRL: 2.5% Public Open Space: 1.6% Secondary Forest- NRL: 1.2%	1.2%	Cultivated: 36.2% Forested Wetland: 25.3% Forested (Evergreen and Deciduous) 19.1% Pasture/Grassland: 23.1% Emergent Wetland: 6.0% Scrub/Shrub wetland: 5% Scrub/Shrub: 3.6% Developed: 3.4%	Dikes/Levees: 2.1%	Lake: Docks: 20 Lake- Boat Ramps: 2 Riverine: Bridges: 2 Docks: 1	Floodplain: 87% Floodway: 77% Channel migration hazard area: 85%	1,196 acres- 11%	Wetlands: 2,911.5 acres—25.7% Steep Slopes: 87.4 acres – 0.8% Priority Habitat Areas: Bald Eagle: 341.8 acres Islands: 446.8 acres Rocky Mountain Elk: 2,042.1 acres Snag-rich areas: 12.9 acres Swan Species: 18.4 acres Trumpeter Swan: 77.9 acres Waterfowl Concentrations: 40.0 acres Wetlands: 1,498.0 acres
			Current Land Use: Agriculture: 33.7% Undeveloped Land and Water Areas: 24.6% Not Classified (Water, ROW): 17.4% Timber/Forestry: 13.0% Single Family Residential: 7.0% Services: 1.3% Multi-Family Residential: 1.1%							

Management Unit	Unit Area (Acres)	Unit Length (Miles)	Inventory Elements							
			Dominant Land Use Patterns	Impervious Surfaces	Vegetation	Armoring (% of shoreline length)*	Overwater Structures (#/shoreline length)	Floodplain, Floodway, and Channel Migration Hazard Area	Open Space/Parks	Critical Areas
Management Unit 9: Upper Skagit River	26,513	River/ Stream: 362.0 Lake: 61.7	Comprehensive Plan Zoning: Public Open Space: 48.5% Industrial Forest-NRL: 22.1% Rural Reserve: 8.1% Secondary Forest- NRL: 5.7% Rural Resource- NRL: 3.7% Agricultural- NRL: 3.3% Rural Intermediate: 1.1%	0.9%	Evergreen Forest:47.3 Cultivated: 37.2% Forested Wetland: 17.2% Forested (Mixed and Deciduous) 10.1% Scrub/Shrub: 7.3% Pasture/Grassland: 4.0% Scrub/Shrub wetland: 3.6% Developed: 1.9% Emergent Wetland: 1.5%	Other armoring: 6.3%	Riverine: Bridges: 9 Buoys/Floats: 1 Docks: 1	Floodplain: 47% Floodway: 30% Channel migration hazard area: 34%	26,156 acres-99%	Wetlands: 4,102.9 acres—15.5% Steep Slopes: 839 acres – 3.2% Priority Habitat Areas: Bald Eagle: 1,459.4 acres Biodiversity Areas and Corridors: 1.4 acres Harlequin Duck: 2,388.3 acres Islands: 117.4 acres Lynx: 1,490.8 acres Rocky Mountain Elk: 972.1 acres Roosevelt Elk: 972.1 acres Trumpeter Swan: 38.7 acres Wetlands: 1,123.0 acres
			Current Land Use: Undeveloped Land and Water Areas: 55.0% Not Classified (Water, ROW): 14.8% Timber/Forestry: 9.7% Single Family Residential: 5.6% Agriculture: 4.7% Cultural , Entertainment, and Recreational: 3.2% Transportation, Communication, and Utilities: 2.9% Services: 2.2% Other Resource Production: 1.0%							
Management Unit 10: Nooksack River	1,293	River/ Stream: 23.8	Comprehensive Plan Zoning: Industrial Forest-NRL: 57.5% Public Open Space: 42.5%	0.2%	Evergreen Forest:49.5% Cultivated: 38.2% Forested (Mixed and Deciduous): 32.7% Scrub/Shrub: 11.5% Scrub/Shrub wetland: 1.2%	NA	Riverine: Bridges: 2	Floodplain: 44% Floodway: NA Channel migration hazard area: NA	1,036 acres- 80%	Wetlands: 360.1 acres—27.8% Steep Slopes: 10.7 acres – 0.8% Priority Habitat Areas: Biodiversity Areas and Corridors: 594.5 acres Harlequin Duck: 41.4 acres Rocky Mountain Elk: 1,203.9 acres Wetlands: 235.2 acres
			Current Land Use: Undeveloped Land and Water Areas: 37.7% Timber/Forestry: 36.8% Not Classified (Water, ROW): 13.2% Transportation, Communication, and Utilities: 12.2%							
Management Unit 11: Stillaguamish River	3,627	River/ Stream: 69.5	Comprehensive Plan Zoning: Industrial Forest-NRL: 46.9% Public Open Space: 45.9 Rural Village Residential: 4.7% Secondary Forest- NRL: 2.3%	0.6%	Evergreen Forest: 74.9% Cultivated: 39.2% Forested (Mixed and Deciduous): 15.6% Scrub/Shrub: 6%	NA	Lake: Docks: 423 Buoy's/Floats: 1	Floodplain: 2% Floodway: NA Channel migration hazard area: NA	3,269 acres- 90%	Wetlands: 149.6 acres—4.1% Steep Slopes: 132.3 acres – 3.6% Priority Habitat Areas: Old-growth/Mature Forest: 11.7 acres Wetlands:81.8 acres
			Current Land Use: Undeveloped Land and Water Areas: 62.5% Timber/Forestry: 24.1% Not Classified (Water, ROW): 9.4% Single Family Residential: 4.0%							

*Armoring occasionally occurred just landward of the area of shoreline jurisdiction (200 feet from OHWM). Because armoring effects extend waterward of the armoring itself (Hood 2004), in the evaluation of management unit area, the total armoring was considered, including armoring just outside of shoreline jurisdiction.

3.1 Marine Shorelines

Detailed descriptions and evaluation of the County's marine shorelines are provided in the Shoreline Analysis Report (TWC 2014). The following provides a brief summary of marine shorelines in the County. Unincorporated Skagit County's marine and estuarine shorelines are characterized by diverse shoreforms, including spits, bluffs, lagoons, tide flats, tidal deltas, and rocky outcrops. Each of the County's shoreforms and nearshore habitats provide unique ecological functions and processes. For example, bays, inlets, and pocket estuaries provide sheltered, productive, shallow-water rearing habitat for juvenile salmonids and other aquatic species. Eelgrass, kelp, and salt marsh habitats provide food and habitat for juvenile salmonids and other organisms. Sand and gravel beaches provide spawning habitat for forage fish, including sand lance and surf smelt. Feeder bluffs provide a source of fine sediment to replenish beaches with sand and gravel, which forage fish use to spawn.

Skagit County's nearshore area encompasses a wide variety of conditions, ranging from relatively unmodified reaches of natural shoreline to agricultural fields and developed parcels with private residences and associated armoring structures.

Much of the County's marine shorelines are armored at or below the ordinary high water mark (OHWM) (includes bulkheads, rip-rap, gabion, etc.). Areas of armoring are dispersed along the shoreline, often interspersed among more pristine areas. Armoring is particularly prevalent in the Skagit River delta, Samish Bay, Padilla Bay, and the Swinomish channel. Armoring is more limited on the islands, including Fidalgo Island. Shoreline stabilization can have a number of potential impacts to shoreline functions depending on the shoreform. Where armoring is located waterward of an eroding bluff, impoundment of sediment recruitment from backshore areas limits the introduction and transport of fine sediment, resulting in the coarsening of beach substrate and the loss of species associated with sandy or silty substrates, including eelgrass beds (reviewed in Fresh et al. 2011). Where armoring is situated below the level of mean higher high water (MHHW), the armoring structure will artificially truncate the upper intertidal area. Armoring may also reflect wave energy downward, resulting in the steepening of the shoreline, which reduces the availability of shallow water habitat critical to life histories of several fish and invertebrates (reviewed in Fresh et al. 2011).

Overwater and in-water structures occur along the County's marine shorelines, including piers, docks, and floats; boat launches; and overhanging structures such as decks, houses and other overwater buildings. Shading from overwater structures limits the growth of subtidal vegetation and the nearshore communities it supports (Fresh et al. 1995). Additionally, juvenile salmon tend to avoid the abrupt transition from light to dark, instead moving away from productive shallow water habitats and into deeper water areas with greater exposure to predators (Nightingale and Simenstad 2001).

The County's shorelines are also impacted by stormwater outfall pipes delivering untreated stormwater directly to the nearshore environment.

3.2 Freshwater Shorelines

Detailed descriptions and evaluation of the County's freshwater shorelines are provided in the Shoreline Analysis Report (TWC 2014). The following provides a brief summary of freshwater shorelines in the County. Freshwater streams and rivers are numerous in Skagit County, and span from high-elevation, glacier-fed streams to large lowland rivers. Skagit County shorelines also include several lakes, ranging from undisturbed alpine lakes in the Cascade Mountains to lower elevation, large lakes with developed shorelines. Riparian areas in Skagit County consist of various forest-seral stages, ranging from deciduous forest to mixed deciduous-coniferous forest to coniferous forest. Vegetation characteristics of the riparian area, including large woody debris recruitment, overhanging vegetation, species composition, canopy cover, and others, vary significantly within and between watersheds.

Streams and floodplains in Skagit County are varied in level of alteration and land use. Overwater structures, including docks and piers, are common on the County's lake shorelines, but overwater structures on river shorelines are typically limited to bridge crossings. Associated wetlands and floodplains of some streams have been cleared and filled for development. Other land uses, such as hatcheries, roads, and agriculture, may affect fish habitat, water quality, and migratory barriers.

3.3 Fish and Wildlife

Several species depend on Skagit's shorelines for all or part of their life cycles. The following species have been designated for protection by federal, state or local resource management agencies and are known to occur or may potentially occur in Skagit County:

- Killer Whale (Southern Resident Distinct Population Segment (DPS))
- Humpback Whale
- Chinook Salmon (Puget Sound Evolutionary Significant Unit (ESU))
- Steller Sea Lion
- Bocaccio, Yelloweye, and Canary Rockfish (Puget Sound/Georgia Basin DPS)
- Bull Trout (Coastal/Puget Sound ESU)
- Chum Salmon (Hood Canal summer-run ESU)
- Steelhead Trout (Puget Sound DPS)
- Bald Eagle
- Marbled Murrelet
- Spotted owl
- Peregrine falcon
- Oregon spotted frog
- Common loon
- Fisher
- Grey wolf
- Grizzly bear
- Lynx

Shellfish are another ecological and economic component of Skagit County shorelines. Forage fish in the Skagit County area include surf smelt, sand lance and Pacific herring.

Marine riparian vegetation, and particularly overhanging vegetation, provides several benefits to the nearshore environment, including a source of detritus and terrestrial insect prey for juvenile salmonids (reviewed in Brennan and Culverwell 2004). Shade in the upper intertidal zone is an important factor in the successful incubation of surf smelt and Pacific sand lance eggs (Penttila 2007, Rice 2006). Areas of dense vegetation also encourage infiltration and nutrient uptake, as well as filtration of sediment and associated contaminants. Vegetation overhanging the shoreline is influenced by both natural shoreform (e.g., sand spits are naturally unvegetated and will not have overhanging vegetation) and shoreline development.

4 FUTURE DEVELOPMENT

4.1 Residential Land Use Capacity

Table 4-1 below summarizes the residential development capacity broken down by management unit and rural versus urban areas. A summary discussion of the overall land use capacity results, broken down by shoreline environment designation (discussed further in Section 5.1) for marine and freshwater shorelines, is provided in the following section.

Table 4-1. Estimated residential land capacity in Skagit County shoreline jurisdiction.

Management Unit	Rural Dwelling Units	Urban Dwelling Units	Total Dwelling Units
1: Samish Bay	53	0	53
2: Samish Island, Padilla Bay, and East Side of Swinomish Channel	320	0	320
3: Swinomish Tribal Reservation	68	1,415	1,483
4: Fidalgo Island and Other Islands	752	0	752
5: Skagit Bay/Delta	146	0	146
6: Lower Skagit – Diking Districts	467	364	832
7: Samish River	308	0	308
8: Middle Skagit	574	0	574
9: Upper Skagit (WRIA 4)	1,768	0	1,768
10: Nooksack (WRIA 1)	0	0	0
11: Stillaguamish (WRIA 5)	81	0	81
TOTAL	4,537	1,780	6,317

4.2 Other Land Use Capacity and Anticipated Development

4.2.1 Marine Shorelines

Skagit County's marine shorelines could accommodate significant single-family residential development, as well as the majority of potential new commercial and industrial development in the County. The greatest residential land capacity on marine shorelines occurs in the

Swinomish Tribal Reservation, where a large portion of the shoreline jurisdiction comprises the Swinomish UGA. Significant residential development could also be accommodated in shoreline jurisdiction in the Fidalgo and Other Islands Management Unit. Available land for new residential development is substantially limited in the Samish Bay Management Unit.

The following discussion addresses existing land use patterns and anticipated development in key areas of potential growth along marine shorelines in terms of proposed environment designations, including Natural, Rural Conservancy, Shoreline Residential, and High Intensity designations. See Section 5.1 below for a detailed description of environment designations.

Natural

Overall, development in the Natural environment designation on the County's marine shorelines is expected to be limited. Areas protected under the Natural designation include relatively undeveloped portions of Guemes, Cypress, and Sinclair Islands, as well as the entire shoreline length of smaller undeveloped islands, including Vendosi, Goat, Kiket, Ika, Hope, and Skagit Islands. Other areas designated as Natural include the forested northwest side of the Swinomish Reservation, salt marsh in Skagit Bay, and undeveloped rocky shorelines on the southwest side of Fidalgo Bay.

Several parks are included in the Natural designation, including Skagit Island State Park, Hope Island State Park, Hat Island State Park, Saddlebag Island State Park, and the Kukatali Preserve (composed of Kiket and Flagstaff Islands and jointly managed by Washington State Parks and the Swinomish Indian Tribe). The Washington Department of Fish and Wildlife's Skagit Wildlife Area in the Skagit River delta is also included in the Natural designation. Uses of these parks consist of passive recreation (e.g., wildlife viewing, hiking trails). New trails, day use facilities, and vault toilets are planned at Kukatali Preserve (State Parks 2012).

Rural Conservancy

The Rural Conservancy environment has the most developable marine shoreland area of all of the environment designations. Existing land use conditions and anticipated development along the County's marine shorelines are described by Management Unit in Table 4-2.

Table 4-2. Existing and anticipated development in marine management units in the proposed Rural Conservancy designation.

Management Unit	Existing Conditions	Anticipated Development
Management Unit 1: Samish Bay	Current land use is primarily agricultural, and dikes are present along the majority of agricultural lands. Forestry and aquaculture uses are also present. Areas identified as developable lands are large agricultural lots in the southern portion of the Management Unit. Larrabee State Park occupies the northern boundary.	Agricultural and forest resource lands are zoned for natural resource uses and are expected to remain. Dike maintenance is likely to occur. State Parks is planning maintenance activities, trail work, and construction of a footbridge for beach access at Larrabee State Park.
Management Unit 2: Samish Island, Padilla Bay, and East Side of Swinomish Channel	Agriculture is the dominant land use. Dikes are present along the majority of the shoreline. Large lots with potential for subdivision are present throughout much of the Management Unit, including the point of Samish Island, Padilla Bay, and the east side of the Swinomish Channel.	Agricultural lands are zoned for natural resource uses and are expected to remain in those uses. Residential development could occur through subdivision of large lots.
Management Unit 3: Swinomish Tribal Reservation	Developable land in the Swinomish Reservation is limited to the wetland complex and agricultural parcels near the northwest end of the Swinomish Channel.	Agricultural lands are zoned for natural resource uses and are expected to remain in those uses. Development in the wetland complex is unlikely given the limitations imposed by critical area standards.
Management Unit 4: Fidalgo Island and Other Islands	Existing rural residential development on Fidalgo Island and Guemes Island. Sinclair, Burrows, and Allan Islands support intact forests and relatively undisturbed shorelines. DNR owns property at Secret Harbor. Net pens are present in Deepwater Bay off of Cypress Island.	Potential development on Fidalgo Island includes rural residential infill. Large lots on Guemes Island are encumbered by wetlands; therefore, residential development is likely to occur in more limited areas of existing small lots. Sinclair Island would provide significant residential development capacity. Additional development on this and other islands (e.g., Allen, Burrows) would likely require roads, utilities, and marine transportation facilities. Net pens are likely to remain off of Cypress Island; however, the Secret Harbor Management Plan would not allow additional net pen facilities.

Management Unit	Existing Conditions	Anticipated Development
Management Unit 5: Skagit Bay/ Delta	Existing uses are primarily agriculture, separated from salt marsh vegetation by dikes.	Agricultural lands are zoned for natural resource uses and are expected to remain.

Shoreline Residential

Significant new development in the Shoreline Residential environment designation is anticipated to occur primarily through development of existing vacant and underdeveloped properties and subdivision of existing large shoreline lots. A summary of existing land use conditions and anticipated changes is provided in Table 4-3.

Table 4-3. Existing and anticipated development in marine Management Units in the proposed Shoreline Residential designation.

Management Unit	Existing Conditions	Anticipated Development
Management Unit 1: Samish Bay	Not applicable: No Shoreline Residential	Not applicable
Management Unit 2: Samish Island, Padilla Bay, and East Side of Swinomish Channel	Samish Island, Bayview, and east side Swinomish Channel: Bayview and east side of Swinomish Channel are nearly fully developed. Typical vegetated setbacks range from 30-100 feet. Private buoys are common on Samish Island, and a few residential piers are present.	Potential for residential infill on small lots on Samish Island. Additional residential buoys are likely.
Management Unit 3: Swinomish Tribal Reservation	Shelter Bay and southwest side of Swinomish Reservation: Shoreline jurisdiction is nearly fully developed. In Shelter Bay, typical residential setbacks are approximately 20 feet, and undeveloped lots are cleared and graded. Elsewhere within the Shoreline Residential designation, typical setbacks range from 20 to 75 feet. Setbacks of up to 115 feet are found at residences situated at the tops of bluffs. Many existing single and joint use piers and a marina occur in Shelter Bay.	Potential for significant residential infill on small lots in the Swinomish UGA. Repair and replacement of piers in Shelter Bay may be anticipated.

Management Unit	Existing Conditions	Anticipated Development
Management Unit 4: Fidalgo Island and Other Islands	Fidalgo and Guemes Islands: Rural residential areas on a range of shoreforms, including beaches, rocky shores, bluffs, and bluff-backed beaches. Setbacks vary widely, from 10 feet to 125 feet on low bank and rocky shoreforms, and up to 400 feet on erodible bluffs. The condition of vegetation within the setback also varies widely.	Likely development consists of residential development of existing small lots and potential subdivision of larger lots.
Management Unit 5: Skagit Bay/Delta	Not applicable: No Shoreline Residential	Not applicable

High Intensity

High Intensity-designated shorelines are limited in extent to existing urbanized areas. The majority of commercial development capacity in and near the County's shoreline jurisdiction occurs on the northwest side of March Point on Fidalgo Island in the Anacortes UGA, where a large amount of industrial property is available for potential future redevelopment. An existing road closely parallels the shoreline on the west side of March Point, limiting natural shoreline processes there. Other commercial and industrial redevelopment potential exists on the north end of the Swinomish Channel. An existing log storage facility, which includes several log booms and other overwater structures, is present in the Swinomish UGA shoreline area. The use of this facility is expected to continue.

4.2.2 Rivers and Streams

The County's river and stream shorelines are projected to see the majority of their population growth and additional single-family home development occur on portions of parcels that lie outside of shoreline jurisdiction. A review of Table 4-1 shows that approximately 28 percent of the residential development capacity exists in the Upper Skagit (WRIA 4) Management Unit. This can be attributed to the large lots of private timber lands in this management unit, which have potential for subdivision. Due to the larger parcel sizes found in the Upper Skagit Management Unit, it is also likely that the majority of potential residential units found in this management unit would be located outside of shoreline jurisdiction. Significant residential capacity is also available in the Lower Skagit, the Middle Skagit, and the Samish River Management Units. Development may be more likely to occur in these areas because they are closer to urban population centers compared to the Upper Skagit. Available land for new residential development is substantially limited in the Nooksack Management Unit and the Stillaguamish Management Unit.

The following discussion addresses existing land use patterns and anticipated development in key areas of potential growth along rivers and streams in terms of proposed environment designations, including Natural, Rural Conservancy-Skagit Floodway, Rural Conservancy, Urban Conservancy, and Shoreline Residential designations.

Natural

The Natural designation includes the highest functioning shoreline areas in the County. Lands in Federal ownership, including lands in North Cascades National Park, Mount Baker-Snoqualmie National Forest, and the Okanogan Wenatchee National Forest, are included in the Natural designation. Development in the Natural environment designation is expected to be limited to passive recreational uses and limited forestry practices associated with private leases of federal forest lands.

Rural Conservancy - Skagit Floodway

The Rural Conservancy - Skagit Floodway designation consists of undeveloped floodway areas, as well as some areas with relatively dense residential development. New development in the Skagit River floodway is substantially limited by the County's Flood Damage Prevention regulations (See Section 5.4.4). Where existing residential development occurs within the floodway, this development will be repaired and maintained, but new development in these areas will be very limited. Anticipated uses are expected to include ongoing agriculture, timber harvesting, and natural resource-based low-intensity uses, consistent with flood hazard regulations.

Rural Conservancy

Much of the residential development capacity on Skagit County's stream and river shorelines occurs within the Rural Conservancy environment. Where agriculture and forestry practices presently occur, these areas are expected to predominantly stay in resource use. Conversion of agricultural or forest lands to residential development would be limited in density to 20-80 acre lots on average.

Shoreline Residential

Shoreline Residential areas are limited along the County's rivers and streams to lands on the Skagit River across from and just east of Concrete. Shoreline Residential areas consist of small-lot residential areas located on bluffs along the River. Vacant lots in these areas allow for potential new residential development in these areas.

4.2.3 Lakes

The following discussion addresses existing land use patterns and anticipated development in key areas of potential growth along lakes in terms of proposed environment designations, including Natural, Rural Conservancy-Skagit Floodway, Rural Conservancy, and Shoreline Residential designations.

Natural

Lake shorelines proposed for the Natural designation include undeveloped areas of high functioning forest and lake fringe wetlands. Given the intact existing conditions and protective provisions proposed under the Natural designation, development in the Natural designation will be very limited. A description of existing lake shoreline conditions and likely development is provided in Table 4-4.

Table 4-4. Existing and anticipated development on lake shorelines in the Natural designation.

Management Unit	Existing Conditions	Anticipated Development
Management Unit 4: Fidalgo Island and Other Islands	Pass Lake and a portion of the wetlands associated with Campbell Lake are in Deception Pass State Park. The lakes are located away from active use areas.	Given the remote setting and presence of wetlands, no development is anticipated at Pass Lake or the Campbell Lake wetlands.
Management Unit 6: Lower Skagit Diking Districts	Undeveloped shorelines of Devils Lake, the south end of Big Lake, and the north side of Clear Lake.	Development is not anticipated in these shoreline areas. Wetland buffers will apply in many areas.
Management Unit 8: Middle Skagit	Minkler Lake shorelines consist of densely vegetated forested wetlands.	No development is anticipated given the extensive wetlands at the site.
Management Unit 11: Stillaguamish	Summer Lake is undeveloped and remote.	No development is anticipated in shoreline jurisdiction given the remote location.

Rural Conservancy

Lake shorelines proposed for the Rural Conservancy designation typically consist of low-density residential areas, which generally have potential for additional infill of residential development. Existing land use conditions and likely development along the County's lake shorelines are described by Management Unit in Table 4-5.

Table 4-5. Existing and anticipated development on lake shorelines in the Rural Conservancy designation.

Management Unit	Existing Conditions	Anticipated Development
Management Unit 4: Fidalgo Island and Other Islands	Campbell Lake and Lake Erie support existing rural residential development and private docks. Typical setbacks range from 85-165 feet.	Rural infill development is anticipated, as well as additional docks.
Management Unit 6: Lower Skagit Diking Districts	Low density residential development and agricultural uses occur in the Rural Conservancy areas of shoreline lakes. Setbacks for existing development are typically greater than 200 feet.	Subdivision of large lots may result in additional residential development on shoreline lakes. New piers may be anticipated.
Management Unit 8: Middle Skagit	Judy Reservoir is maintained as a water storage reservoir with mowed grass and a path surrounding most of the waterbody.	Ongoing reservoir operations are expected in the shoreline area.
Management Unit 9: Upper Skagit	Water levels in Lake Shannon are managed at the Lower Baker Dam. The lake's shorelines are remote and undeveloped.	Development is expected to be limited and could include developing public access, including day use facilities and a boat ramp.
Management Unit 11: Stillaguamish	Rural Conservancy areas of Lake Cavanaugh are forested and undeveloped, except that a road parallels within 20 feet of the shoreline.	Existing parcels could be subdivided to create small lots with lake frontage. If development occurs, new piers would be anticipated.

Shoreline Residential

Areas proposed as Shoreline Residential designation on Skagit County lakes are predominantly developed with existing small-lot residential development. Anticipated land use changes include residential infill, redevelopment of existing structures, and development or redevelopment of associated structures (e.g. docks). Existing land use conditions and likely development along the County’s lake shorelines are described by Management Unit in Table 4-6.

Table 4-6. Existing and anticipated development on lake shorelines in the Shoreline Residential designation.

Management Unit	Existing Conditions	Anticipated Development
Management Unit 4: Fidalgo Island and Other Islands	Limited areas of Campbell Lake and Lake Erie support higher density residential uses. Many residences have existing docks. On Campbell Lake, setbacks range from 10-70 feet, and nearly all existing residences have shoreline armoring. Setbacks are larger on Lake Erie, ranging from 30 to 150 feet, and only a few residences have bulkheads.	Minor infill of residential development and repair or replacement of existing docks and bulkheads is expected.
Management Unit 6: Lower Skagit Diking Districts	Shoreline Residential portions of Big Lake, Lake McMurray, and Clear Lake are nearly fully developed with single family residences, most of which have single-use piers, and some of which have bulkheads. Existing setbacks range from 10 to 100 feet.	Redevelopment of existing structures and repair or replacement of existing piers are anticipated.
Management Unit 11: Stillaguamish	Shoreline Residential areas on Lake Cavanaugh are nearly fully developed with single family residential uses. Typical setbacks range from 10-60 feet. Most residences have single use piers, and a portion have bulkheads.	Redevelopment of existing structures and repair or replacement of existing piers and bulkheads are anticipated.

4.3 Potential Use Conflicts

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

5 EFFECTS OF DEVELOPMENT WITH APPLICATION OF THE SMP

5.1 Environment Designations

The first line of protection of the County's shorelines is the environment designation assignments. According to the Guidelines (WAC 173-26-211), the assignment of environment designations must be based on the existing use pattern, the biological and physical character of

the shoreline, and the goals and aspirations of the community as expressed through a comprehensive plan.

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

Consistent with WAC Shoreline Master Program Guidelines, the County's environment designation system is based on the existing use pattern, the biological and physical character of the shoreline, and community interests. The Shoreline Analysis Report provided information on shoreline conditions and functions that informed the development of environment designations for each of the shoreline waterbodies. The proposed environment designations, consistent with SMP Guidelines, include: Natural, Rural Conservancy, Rural Conservancy-Skagit Floodway, Urban Conservancy, Shoreline Residential, and High Intensity. An Aquatic environment designation applies to most shorelines waterward of the ordinary high water mark (OHWM).

The **Natural** environment designation is intended for shorelines that are relatively free of human influence or that include intact or minimally degraded shoreline functions. These shorelines include areas of intact ecological functions, areas of geologic significance, and areas that are otherwise unable to support new development without significant adverse effects on ecological functions or risk to human safety. Approximately 34 percent of the County's total shoreline area is in the Natural environment designation (Figure 5-1).

The **Rural Conservancy** designation covers 44 percent of the County's entire shoreline area (Figure 5-1). The Rural Conservancy environment designation is intended to protect ecological functions, conserve existing natural resources and valuable historic and cultural areas, provide for sustained resource use, achieve natural floodplain processes, and provide recreational opportunities. The Rural Conservancy designation includes areas supporting low-intensity resource-based uses (e.g., agriculture, forestry, and recreation) or areas with existing development that are subject to environmental limitations (e.g., steep banks, feeder bluffs, and floodplains).

The **Rural Conservancy- Skagit Floodway** designation incorporates the purpose of the Rural Conservancy designation. Within the Rural Conservancy- Skagit Floodway environment, all of the Rural Conservancy policies apply. In addition, shoreline areas within this designation are located within the floodway of the Skagit River from the State Route 9 bridge upstream to the confluence of the Skagit and Sauk Rivers. This floodway area is intended to be relatively free of artificial impediments to allow for natural flood processes along the Skagit River, and development within the floodway is significantly constrained by Skagit County Code (SCC) Chapter 14.34, Flood Damage Prevention. Uses allowed in the Rural Conservancy- Skagit Floodway environment designation include low-impact outdoor recreation uses, forest production, agricultural uses, aquaculture, and natural resource-based low-intensity uses,

consistent with flood hazard regulations. Approximately 19 percent of the County’s shoreline area is within the Rural Conservancy- Skagit Floodway designation (Figure 5-1).

The **Urban Conservancy** designation is limited to one percent of the total shoreline area in the County (Figure 5-1). The purpose of the designation is to protect and restore ecological functions of open space, floodplain, and other sensitive lands where they exist in urban and developed settings, while allowing a variety of compatible uses. The designation applies to areas within UGAs or “limited areas of more intensive rural development” (LAMIRDs), where existing and planned development is compatible with maintaining and restoring ecological functions.

The **Shoreline Residential** designation applies to 2 percent of the shoreline area, but 22 percent of all parcels in shoreline jurisdiction (Figure 5-1 and 5-2). The purpose of the designation is to accommodate higher-density residential development and appurtenant structures that are consistent with this SMP, and to provide appropriate public access and recreational uses. The designation applies to UGAs and LAMIRDS, as well as master planned resorts or existing areas of higher-density residential development in unincorporated parts of the County, generally characterized by lots smaller than one acre.

High Intensity is the least frequently recommended environment designation (0.3% of the total shoreline area) in the County (Figure 5-1), and is limited to shoreline areas within UGAs and industrial or commercial LAMIRDs, if they currently support high-intensity uses related to commerce, transportation, or navigation, or are suitable and planned for high-intensity water-oriented uses. The High Intensity management policies call for full utilization of existing urban areas prior to expansion of existing development.

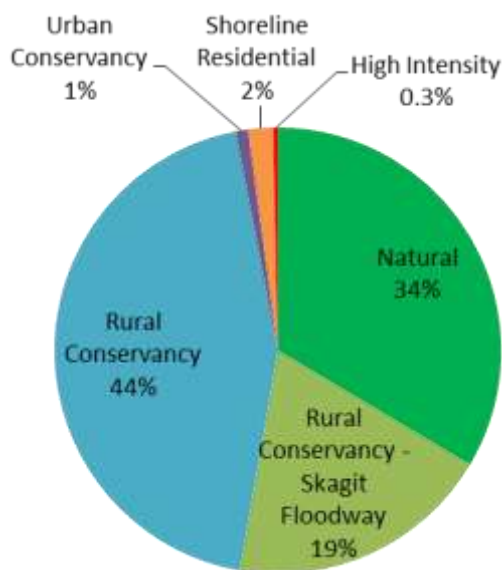


Figure 5-1. Distribution of Shoreline Environment Designations by Acres in Skagit County

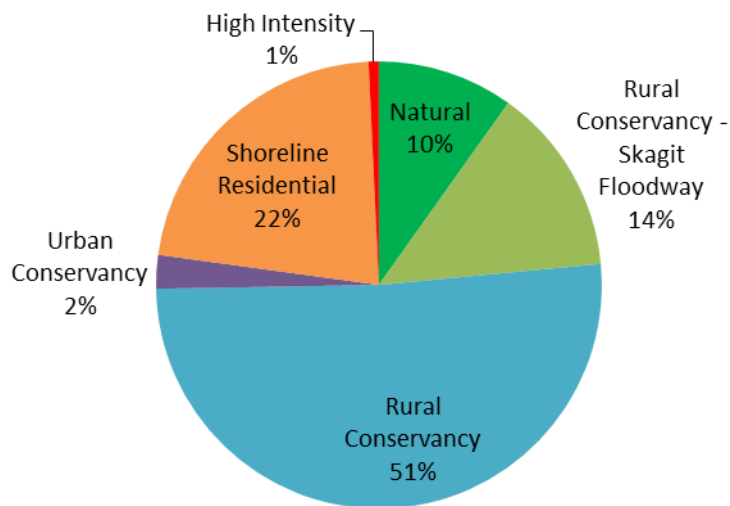


Figure 5-2. Distribution of Shoreline Environment Designations by Number of Parcels in Skagit County

The analysis of shoreline functions presented in the Shoreline Analysis Report was used to guide the assignment of environment designations. Figure 5-3 shows an association between more protective shoreline environment designations and higher-functioning shorelines. Shorelines with higher levels of existing impairments are associated with shoreline environment designations that allow more intensive development (i.e. High Intensity and Shoreline Residential). Overall, this analysis indicates that the shoreline environment designations proposed by the County are consistent with the approach of concentrating development activity in existing degraded areas and providing greater regulatory protection for areas with a higher level of existing functions.

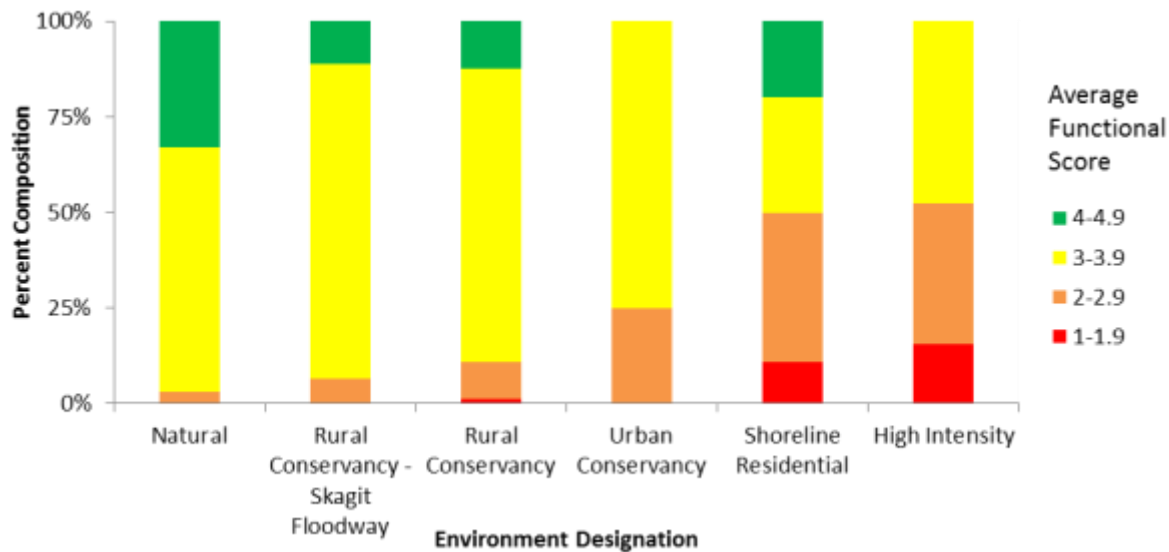


Figure 5-3. Distribution of Functional Scores among Proposed Skagit County Environment Designations

The Use and Modification Matrix identifies the prohibited and allowed uses and modifications in each of the shoreline environments. It clearly shows a hierarchy of higher-impacting uses and modifications being allowed in the already highly-altered shoreline environments, with uses more limited in the less developed areas either through prohibition or a requirement for a Shoreline Conditional Use Permit.

The allowed and prohibited uses established in the Use and Modification Matrix help minimize cumulative impacts by concentrating development activity in lower functioning areas that are not likely to experience significant function degradation with incremental increases in new development. Furthermore, prohibited and permitted uses specific to environment designations limit potential conflicts between neighboring uses and ensure that uses are consistent with comprehensive plans, zoning, and existing functions.

5.2 General Regulations

The SMP contains a number of general regulations (see SMP Part III), intended to protect the ecological functions of the shoreline, prevent adverse cumulative impacts and satisfy the main objectives of the SMA. The General Regulations chapter includes topics such as “no net loss or adverse effects,” dimensional standards, flood hazard reduction, vegetation conservation, and water quality, stormwater, and nonpoint pollution regulations that apply to all activities, uses and modifications.

The proposed SMP requires all uses and developments to be designed, located, sized, constructed and maintained to achieve no net loss of shoreline ecological functions (14.26.305(1)). Allowable development in the channel migration zone or floodway is limited to restoration, forest practices, existing and ongoing agriculture, mining, necessary infrastructure,

development within UGAs where existing structures prevent active channel movement and flooding, and necessary shoreline stabilization (14.26.350(3)(b)). New development or uses in shoreline jurisdiction, including the subdivision of land, are prohibited when it is reasonably foreseeable that the development or use would require structural flood hazard reduction measures within the channel migration zone or floodway during the life of the development or use (14.26.350(3)(a)). Structural flood hazard reduction measures are only allowed under the following conditions:

- 1) where necessary to protect existing development and nonstructural measures are not feasible,
- 2) where potential impacts to ecological functions and priority species and habitats are fully mitigated,
- 3) where appropriate vegetative conservation actions have been taken, and
- 4) where actions are consistent with an adopted comprehensive flood hazard management plan (14.26.350(2)).

Vegetation clearing must be limited to the minimum necessary to accommodate approved shoreline development (14.26.380(3)(a)). The SMP establishes a preference for avoiding impacts to significant trees and non-significant, native trees (14.26.380(3)(c)). Significant tree retention in shoreline buffers, critical areas, and critical area buffers must be 100 percent (14.26.380(3)(d)). Outside of buffers and critical areas, standards apply for retention of significant trees (14.26.380(3)(d)) (see Table 5-1).

Table 5-1. Vegetation Conservation Standards Applicable to Significant Tree Retention Outside of Shoreline Buffers and Critical Areas

Environment Designation	Retention (%)
Natural	90
Urban Conservancy	65
Rural Conservancy	65
Shoreline Residential	25
High Intensity	25

If fewer significant trees are retained compared to standards of 14.26.380(3)(d), then the additional trees to be removed must be replaced at a 3:1 ratio (14.26.380(3)(d)(iv)). The SMP establishes specific standards for replacement of shrubs and groundcover that are disturbed by development activities (14.26.380(3)(b)).

For development activities with the potential for adverse impacts on water quality or quantity in a fish and wildlife habitat conservation area, a critical areas report must be prepared. Such reports will discuss the project’s potential to exacerbate water quality parameters which are impaired and for which Total Maximum Daily Loads (TMDLs) have been established, and prescribe any necessary mitigation and monitoring (14.26.550(4)). To protect surface and groundwater quantity and quality in all areas within shoreline jurisdiction, the SMP requires that shoreline use and development incorporate protective measures in accordance with applicable local, state, and federal laws (14.26.390(1)). All development that may come in contact with surface or groundwater must be constructed of materials that will not adversely

affect water quality or aquatic plants or animals, and that are consistent with applicable state and federal standards (14.26.390(2)).

5.2.1 Mitigation Sequencing

The County's critical areas regulations, incorporated into the SMP by reference, (with some specific additional standards and omissions included in Part V of the proposed SMP) include mitigation sequencing requirements (SCC 14.24.080(5)(b)). Mitigation sequencing involves first avoiding impacts where possible, and then minimizing the intensity of impacts; finally, where remaining impacts are unavoidable and cannot be reasonably minimized, mitigation is required to compensate for those remaining unavoidable impacts and ensure that shoreline functions are retained. SMP Section 14.26.710, Applications, states that an applicant must submit a mitigation sequencing analysis if required by Part V, Critical Areas. Additionally, some uses and modifications (boating facilities, aquaculture, and shoreline stabilization) specifically include a requirement for new uses to follow mitigation sequencing consistent with SMP Part V, Critical Areas. The application of mitigation sequencing standards should further help ensure that certain shoreline uses and modifications achieve no net loss of shoreline ecological functions.

When mitigation sequencing is not required per Part V, Critical Areas, or specific provisions of the SMP, specific objective standards for avoiding (e.g., placement), minimizing (e.g., size, materials, and design standards), and compensating for unavoidable impacts (e.g. specific planting requirements) as well as the general provisions for flood hazard reduction, vegetation conservation, and water quality, stormwater, and nonpoint pollution, which apply throughout shoreline jurisdiction, will help achieve no net loss of shoreline ecological functions.

5.3 Use and Modification Provisions

The SMP contains numerous shoreline modification and use policies and supporting regulations (see SMP Part IV) intended to protect the ecological functions of the shoreline and prevent adverse cumulative impacts. The following tables provide a brief summary of the primary potential ecological impacts that may arise from various shoreline uses and modifications, as well as a summary of the proposed SMP regulations intended to conserve ecological functions and prevent adverse cumulative impacts.

The potential impacts described in the tables are based on relationships described in the Shoreline Analysis Report (TWC 2014) and the Final Best Available Science Report (TWC 2007). In the interest of brevity, the basis for each relationship is not repeated in the tables below. The tables account for the more significant or most likely impacts, but may not account for the full suite of potential impacts from a given use or modification. These less significant or less likely impacts, while not specifically discussed below, would be addressed during the permitting process through mitigation requirements. Also, the listing of potential impacts does not mean that these impacts occur in every instance of a certain use or modification. For example, Table 5-22 lists potential for residential development to result in temperature impacts on forage fish incubation; however, these impacts would only be realized if the residential development

occurs on a beach with potential forage fish spawning habitat and if nearshore vegetation removal is associated with the residential development.

Regulations that help ensure that impacts are avoided, minimized, and mitigated include provisions that can be separated in the following three general categories: (1) provisions that allow, condition, or prohibit specific types of development depending on shoreline environment designation; (2) provisions that apply specific standards that help avoid and minimize potential impacts; and (3) provisions that require mitigation of impacts and/or demonstration of no net loss of ecological functions. The tables that describe proposed SMP provisions provide an indication of how potential activities may relate to ecological functions or which function or functions the regulations help to protect. It should be noted that an “X” in the following tables indicates a direct relationship between an SMP provision and a shoreline ecosystem function. A blank cell indicates that the SMP provision either does not affect the function or has a less direct effect on the function.

5.3.1 Agriculture

Many of the shorelines in Skagit County are dominated by agricultural uses. Ongoing agriculture is not regulated under the SMA. Areas designated as agricultural lands are included in the exemption for ongoing agriculture, except that new agricultural facilities or accessory uses that require development and non-agricultural development on agricultural lands are not exempt (14.26.410(1)). The proposed SMP includes standards to ensure that new agriculture will result in no net loss of ecological functions.

Table 5-2. Summary of potential impacts from agriculture.

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

Table 5-3. Summary of key agriculture regulations that protect ecological functions.

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
General Standards	New agricultural uses and development in support of agricultural uses must be located and designed to ensure no net loss of ecological functions and no significant adverse impact on other shoreline resources and values. 14.26.410(2)(a)	X	X	X	X
	Agricultural practices, excluding riprap and levees/dikes, must prevent and control erosion of soils and banks. 14.26.410(2)(b)	X	X		
	Use of pesticides and herbicides must comply with provisions of the Washington Pesticide Application Act and the Washington Pesticide Control Act. 14.26.410(2)(c)		X		
	Feedlot operations and animal waste retention and storage areas must not be located within shoreline areas unless direct manure runoff is prevented. 14.26.410(2)(e)		X		
	The bulk disposal of inorganic farm wastes, chemicals, fertilizers, and associated containers and equipment within shoreline areas is prohibited. 14.26.410(2)(f)		X		

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

5.3.2 Aquaculture

Overwater aquaculture facilities and commercial mechanical harvest practices have the potential to disrupt sediment processes and benthic habitat assemblages (Table 5-4).

While all aquaculture facilities have some potential to affect water quality through turbidity caused by sediment disturbance, aquaculture facilities that raise filter-feeding organisms may have the potential to reduce nutrient loads. On the other hand, net pen aquaculture facilities or any facilities that use supplemental feeding practices, antibiotics, pesticides, or herbicides have the potential for significant water quality impacts. Besides local approval, marine net-pen aquaculture is permitted by Ecology through the National Pollutant Discharge Elimination System (NPDES), and facilities must meet the siting guidelines and the conditions set forth in the NPDES permit. The permits place strict requirements for monitoring and reporting to protect state waters and resources.

Table 5-4. Summary of potential impacts from aquaculture.

Functions	Potential Impacts to Functions
Hydrologic	Alteration in hydrologic and sediment processes associated with aquaculture structures.
Water Quality	Reduction in water quality from substrate modification, supplemental feeding practices, pesticides, herbicides, and antibiotic applications.

Functions	Potential Impacts to Functions
Vegetative/ Habitat	Disruption of benthic community.
	Accidental introduction of non-native species or potential interactions between wild and artificially produced species.

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

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Shoreline Designation	In the Natural environment, all forms of aquaculture require a Shoreline Conditional Use Permit (SCUP). Table 14.26.405	X	X	X	X
General Standards	Facilities must be designed and located to prevent the spread of disease; prevent establishment of new nonnative species; and minimize impact to the aesthetics. 14.26.415(4)(a)				X
	Non-water dependent accessory upland structures must be located landward of required shoreline buffers. 14.26.415(4)(b)		X	X	X
	Mitigation sequencing applies, as described in Part V Critical Areas. 14.26.415(4)(c)	X	X	X	X
	An assessment and mitigation plan is required, and the SMP standards for critical saltwater habitats must also be addressed. 14.26.415(4)(d)	X	X	X	X
	Aquaculture operations must be designed, located, and managed to minimize impacts to native eelgrass and macroalgae. 14.26.415(4)(e)			X	X
	Facilities and operations must comply with State and Federal standards 14.26.415(4)(f-j)	X	X	X	X
Floating Aquaculture	Floating aquaculture uses that require attaching structures to the seabed must use anchors that minimize disturbance to substrate. 14.26.415(5)(c)			X	X
Shorelines of Statewide Significance	Mechanical disturbance of bottom materials for shellfish harvest is prohibited on Shorelines of Statewide Significance, except the traditional dredge harvest method may be allowed as a conditional use. All hydraulic harvest methods require a SCUP. 14.26.415(6)(b)	X			X
Net Pens	For all new net pens, the applicant must provide a site characterization survey, including bathymetric and hydrographic information and an underwater photographic survey for presence of critical habitat; and a basic benthic survey once net pens are in place, including sediment chemistry and infauna sampling. 14.26.415(7)(a)		X		X
	A net pen application must demonstrate (i) that the native fish and wildlife resources will not be significantly impacted; and (ii) that state parks, wildlife refuges or reserves, or habitats of local importance will not be significantly impacted. 14.26.415(7)(b)				X

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	A net pen facility must be located at least 1,500 feet from the OWHM, except a lesser distance may be authorized through a Shoreline Variance. 14.26.415(7)(c)				X
Geoduck Aquaculture	A SCUP is required for new commercial geoduck aquaculture. 14.26.415(8)(a)				X
	Geoduck aquaculture should be located where sediments, land and water access, and topography support geoduck aquaculture without significant clearing or grading. 14.26.415(8)(b)	X	X	X	X
	An application for geoduck aquaculture must contain information on planting and harvesting activities; baseline ecological conditions; plans for the use of impervious materials or motorized vehicles on the intertidal sediments; required alterations to the site; use of predator exclusion devices; methods of minimizing turbid runoff; and how the prevention of marine debris accumulation will be addressed. 14.26.415(8)(d)	X	X	X	X
	A SCUP for geoduck aquaculture may include conditions to avoid or limit impacts from siting and operations, and must include mitigation measures, as necessary, and reasonable monitoring and reporting requirements. 14.26.415(8)(e)	X	X	X	X

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

5.3.3 Boating Facilities

Boating facilities include all in-water and overwater structures for the launching and mooring of boats and vessels, including docks, marinas, mooring buoys, launch ramps, and recreational floats. Overwater structures have the potential for a variety of impacts primarily stemming from overwater shading and disturbance of sediment transport. Potential impacts from boat and vessel facilities are summarized below in Table 5-6. The proposed SMP includes standards to ensure that new boating facilities result in no net loss of ecological functions (Table 5-7).

Table 5-6. Summary of potential impacts from boating facilities.

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

Functions	Potential Impacts to Functions
	Disturbance of substrate from pilings and anchors.
	Nighttime lighting effects on fish behavior.
	Loss of habitat for benthic community, less LWD for habitat complexity.

Table 5-7. Summary of key boating facilities regulations that protect ecological functions.

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Shoreline Designation	Natural: All boating facilities, other than mooring buoys and pilings, are prohibited. Table 14.26.405	X	X	X	X
General Provisions	For all new residential development of two or more waterfront dwelling units or subdivisions, only joint-use or community docks are allowed. For existing lots, individual docks are only allowed if the applicant can demonstrate that all other reasonable community or joint-use options are infeasible. 14.26.420(4)(b)(iii)	X	X	X	X
	Applicants must provide an assessment of potential impacts to existing ecological processes; a slope bathymetry map; and an assessment of impacts to existing water-dependent uses and proposed mitigation measures. 14.26.420(3)(a)	X		X	X
	Structure and uses must minimize the area of water covered; minimize the need for new or maintenance dredging; minimize impacts on public swimming beaches, valuable public fishing areas, or aquaculture facilities; avoid the need for new shoreline stabilization; provide and maintain garbage and recycling receptacles; design the facility to avoid prop scour; on lakes with anadromous fish, keep floating structures at least 7 feet above the lake bottom; and prevent grounding. 14.26.420(4)(a)	X	X	X	X
Docks, Piers, and Wharves	Only one dock is permitted per platted or subdivided shoreline lot or unplatted shoreline tract owned for residential purposes. 14.26.420(4)(b)(iii)(A)	X		X	X
	Dimensional standards apply, including maximum length, width and height, and minimum functional grating. Boat/watercraft lifts and watercraft lift canopies are not permitted in marine waters or rivers. Table 14.26.420-1.	X		X	X
Launch Ramps	Launch ramps are permitted only if they provide access to waters that are not adequately served by existing facilities. Launch ramps must be located to minimize the obstruction of currents, alteration of sediment transport, and accumulation of drift logs and debris; where there is adequate water mixing and flushing; where they will not adversely affect flood channel capacity or otherwise create a flood hazard; and where water depths are adequate to eliminate or minimize the need for dredging or filling. 14.26.420(4)(c)	X	X	X	X

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Marinas	Dimensional standards apply, including maximum size. Table 14.26.420-1, 14.26.420(4)(d)(i)	X		X	X
	Must provide fail-safe facilities and procedures for receiving, storing, dispensing, and disposing of oil or hazardous products, as well as a spill response plan for oil and other products. 14.26.420(4)(d)(iv)		X		
	Discharge of sewage, solid waste, fuels and oil, unused bait, and fish or shellfish cleaning wastes into marine water is prohibited. 14.26.420(4)(d)(v)		X		
Moorage	New covered moorage is prohibited, except when necessary for a water-dependent use at commercial, industrial, or transportation-related facilities. 14.26.420(4)(e)(i)			X	X
	Temporary moorages are allowed for vessels used in the construction of boating facilities provided that: upon termination of the project, aquatic habitat in the affected area is returned to its pre-construction condition within one year; construction vessels may not ground or otherwise disturb substrates; and temporary moorage is located to minimize shading of aquatic vegetation. 14.26.420(4)(e)(iii)	X		X	X
Mooring Buoys	Mooring buoys must be located between 50 and 300 feet from the OHWM, and components of the buoy may not be located within 25 feet of vegetated shallows, 300 feet of spawning habitat for listed species, or 25 feet of spawning habitat for other fish species. 14.26.420(4)(f)(ii)(A) and (D)			X	X
Mooring Piles	Piles must be structurally sound and cured prior to placement in or exposure to water. Piles may not be treated with toxic compounds, and the smallest diameter pile feasible shall be used. 14.26.420(4)(g)(i)		X		
	Minimum spacing standards for piles in freshwater and marine waters apply. 14.26.420(4)(g)(iv)	X			X
	Mooring piles are preferred over decked overwater structures. 14.26.420(4)(g)(ii)	X		X	X
	Piles that are an accessory use to a dock may not be located farther than 20 feet from the side of a dock; may not be placed farther waterward than the end of the dock; and must be between 2 and 6 feet above OHWM. 14.26.420(4)(g)(iii)	X		X	X
Recreational Floats	Private recreational floats serving four or fewer dwelling units must be no longer or wider than 8 feet. All other recreational floats should be the minimum size necessary to support the intended use. 14.26.420(4)(h)(ii)			X	X
	Only one recreational float may be approved for adjoining waterfront parcels under single ownership. 14.26.420(4)(h)(iii)(A)			X	X

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Replacement, Expansion, and Repair of Existing Facilities	If docks are replaced, standards for new facilities apply. 14.26.630(3)(a)	X		X	X
	A need must be demonstrated for expansion of existing docks, and enlarged portions must comply with the standards for new facilities. 14.26.630(4)	X		X	X
	Repairs of existing facilities must comply with materials standards for new facilities. 14.26.630(2)(b)		X	X	X
Mitigation	Mitigation sequencing is required. 14.26.420(5)(a)	X	X	X	X
	Mitigation is required at a 1:1 area ratio of new overwater cover to mitigation action. 14.26.420(5)(b)	X		X	X
	In-kind measures are preferred over out-of-kind measures when consistent with the objective of compensating for adverse impacts to ecological functions. 14.26.420(5)(d)	X	X	X	X

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

5.3.4 Commercial/Industrial Development

As noted in the land capacity analysis (Section 4), commercial or industrial shoreline capacity is localized in the Swinomish UGA and the Lower Skagit Management Units. Much of the industrially zoned shoreline is already occupied by essential industrial uses, such as boat repair facilities.

Shoreline designation standards in the proposed SMP limit where and what type of commercial and industrial development may occur. These standards help avoid potential use conflicts and appropriately locate high intensity development in shoreline areas with higher levels of existing alterations. The proposed SMP also includes provisions requiring commercial and industrial development to ensure that these facilities do not result in a net loss of shoreline ecological functions (Table 5-9). Specific standards for shoreline modifications also apply to commercial and industrial development, including clearing and grading, boating facilities, dredge and fill, and aquaculture, among others.

Table 5-8. Summary of potential impacts from commercial and industrial development.

Functions	Potential Impacts to Functions
Hydrologic	Increase in stormwater runoff and discharge in association with more impervious surfaces
	Disruption of shoreline wetlands
Water Quality	Increase in contaminants associated with the creation of new impervious surfaces (e.g.

Functions	Potential Impacts to Functions
	metals, petroleum hydrocarbons)
	Water quality contamination from use and storage of toxic substances
	Greater potential for increased erosion, bank instability, and turbidity associated with vegetation clearing
Vegetative/ Habitat	Reduced shoreline habitat complexity, increased water temperatures, and less LWD
	Loss of or disturbance to riparian habitat during upland development
	Lighting effects on both fish and wildlife in nearshore areas

Table 5-9. Summary of key commercial and industrial development regulations that protect ecological functions.

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Shoreline Designation	Commercial and industrial development are prohibited in the Natural environment except for institutional water-oriented commercial development, which is a conditional use. Non-water-oriented commercial and industrial uses are permitted only in the High Intensity environment. 14.26.405	X	X	X	X
Commercial Standards	Nonwater-oriented commercial uses are prohibited unless they meet one or more of the following criteria: navigability is severely limited at the site, the site is physically separated from the shoreline by another property or a public right of way; the use is part of a mixed-use project that includes water-dependent uses and provides significant public benefit such as public access or ecological restoration. 14.26.430(2)(b)	X	X	X	X
	Nonwater-dependent commercial uses are not allowed overwater, except in existing commercial structures or when they are necessary in support of water-dependent uses. 14.26.430(2)(c)		X	X	X
	New commercial development that requires shoreline stabilization in conjunction with the placement of fill material within Aquatic shoreline areas is prohibited. 14.26.430(2)(d)	X			X
	Accessory commercial uses that do not require a shoreline location must be located landward of water-oriented development and comply with shoreline buffers for nonwater-oriented uses. 14.26.430(4)(a)	X	X	X	X
Industrial Standards	Nonwater-oriented industrial development is only allowed when: navigability is severely limited and the use provides a significant benefit, such as public access or ecological restoration; the use is part of a mixed-use project that includes water-dependent uses and provides a significant benefit, such as public access or ecological restoration; or the site is physically separated from the shoreline by another property or public right of way. 14.26.450(2)(b)	X	X	X	X

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

5.3.5 Dredging and Dredge Material Disposal

Because the SMP establishes standards for new development to avoid the need for future maintenance dredging, the most likely dredging applications are expected to be related to maintenance dredging of previously dredged channels where habitat functions are already altered.

Dredging can have significant effects on sediment transport, short term effects on water quality, and by creating deep water, the act of dredging can eliminate valuable shallow, nearshore habitat (Table 5-10). The proposed SMP requires physical, chemical, and biological evaluation of the proposed dredge material, and surveys of habitat areas must be conducted in order to ensure that potential impacts are avoided, minimized, or offset, such that no net loss of functions is achieved on a project-by-project basis (Table 5-11).

Table 5-10. Summary of potential impacts from dredging and filling.

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

Table 5-11. Summary of key dredge and fill regulations that protect ecological functions.

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Shoreline Designation	Natural environment: Dredging or dredge material disposal are prohibited, unless associated with restoration. Table 14.26.405	X			
Development Standards	Dredging and dredge material disposal is allowed only when consistent with SCC Chapter 14.34 Flood Damage Prevention. 14.26.435(2)(a)	X	X		
	Dredging is permitted only for limited maintenance activities, when there are no feasible alternatives or other alternatives may have a greater ecological impact, or for restoration or enhancement of shoreline ecological functions and processes benefitting water quality or fish and wildlife habitat or both. 14.26.435(2)(c)	X	X	X	X
	Dredging for the primary purpose of obtaining fill material is prohibited, except when: necessary for the restoration of ecological functions; the fill is placed waterward of the OHWM; and the project is associated	X	X		X

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	with a MTCA or CERCLA habitat restoration project or any other significant habitat enhancement project approved through a SCUP. 14.26.435(2)(d)				
	Dredging is prohibited in the following locations, except for maintenance dredging and for beneficial public purposes consistent with the SMP: in estuaries, natural wetlands, and marshes; along net positive drift sectors where accretion shoreforms would be damaged; in shoreline areas and bottom soils that are prone to sloughing, refilling, and continual maintenance dredging; in officially designated fish, shellfish, and wildlife spawning, nesting, harvesting, and concentration areas; where water quality would be degraded below permitted standards; where current and tidal activity are significant, requiring excessive maintenance dredging. 14.26.435(2)(e)	X	X		X
	The following information is required for all dredging applications: A physical and biological inventory and assessment of the area proposed to be dredged, and the dredge materials to be removed; detailed plans for upland dredge material disposal, including a physical and biological assessment of the disposal site; an assessment of potential impacts to ecological functions; and a mitigation plan to address identified impacts. 14.26.435(3)	X	X	X	X
	Dredging and dredge material disposal must be done in a manner that avoids or minimizes significant ecological impacts. Impacts that cannot be avoided must be mitigated in a manner that ensures no net loss of ecological functions. 14.26.435(4)(c)	X	X	X	X
	New development must be sited and designed to avoid or, if that is not possible, to minimize the need for new and maintenance dredging. 14.26.435(2)(b)	X	X		X
	Dredge material disposal landward of the OHWM must meet prescribed standards to minimize discharge, suspended sediment, and impacts to normal drainage patterns. Special consideration for landscaping and buffer areas are subject to County review. 14.26.435(2)(f)	X	X	X	
	Dredge material disposal in open waters is permitted when land disposal is infeasible or less consistent with the SMP; when part of a restoration or enhancement program; when offshore habitat will be protected, restored, or enhanced; when adverse effects on water quality or biologic resources from contaminated materials will be mitigated; when shifting and dispersal of spoils will be minimal; and when water quality will not be adversely affected. 14.26.435(2)(h)	X	X		X

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

5.3.6 Fill, Excavation and Grading

Fill within the floodway, floodplain, or channel migration zone can alter natural processes, affecting downstream functions. Potential impacts from fill are summarized below in Table 5-12. The proposed SMP requires physical, chemical, and biological evaluation of the impacts of proposed dredging, as well as avoidance, minimization, and mitigation of the impacts from dredge disposal and fill, to help ensure that no net loss of functions is achieved on a project-by-project basis (Table 5-13).

Table 5-12. Summary of potential impacts from fill.

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

Table 5-13. Summary of key regulations pertaining to fill that protect ecological functions.

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Shoreline Designation	Natural environment: fill, excavation and grading is prohibited. Aquatic environment: fill requires a SCUP. Table 14.26.405-1	X	X		
Development Standards	Fill, excavation, and grading are only allowed when consistent with SCC Chapter 14.34, Flood Damage Prevention. 14.26.440(2)(a)	X	X		
	Applications for fill, excavation, or grading must include an assessment of physical, chemical, and biological characteristics of the fill/excavated material; location of fill relative to natural or existing drainage patterns; location of perimeter of fill, excavation, or graded area relative to the OHWM: perimeter erosion control or stabilization means; type of surfacing and runoff control devices; and disposal location. 14.26.440(3)	X	X		X
	Disturbed area shall be the minimum necessary to accommodate approved shoreline uses and developments. 14.26.440(4)(a)(i)			X	X
	Work shall be designed and located so shoreline stabilization will not be necessary. 14.26.440(4)(a)(iv)	X	X	X	X
	Work shall be located, designed, and constructed to protect shoreline ecological functions and ecosystem-wide processes. 14.26.440(4)(a)(iii)	X	X	X	X

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	Work shall be designed, constructed, and maintained to prevent, minimize, or control all material movement, erosion, and sedimentation from the affected area. 14.26.440(4)(a)(v)	X	X		X
	Structures supported by pilings are preferred over fills. 14.26.440(4)(b)(iii)	X	X		X
	Materials that may degrade surface and groundwater quality or the shoreline area are prohibited as fill. 14.26.440(4)(b)(ii)		X		
	Fill waterward of the OHWM is allowed only where necessary to support certain listed uses. 14.26.440(4)(b)(iv)	X	X	X	X

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

5.3.7 Forest Practices

Many of the shorelines in Skagit County are dominated by forest resource uses. Ongoing forest practices are regulated under the State's Forest Practice Rules, and not under the SMA.

Conversion of existing forest lands to non-forest uses are regulated by the SMP. The proposed SMP includes standards to ensure that conversions of existing forest lands maintain shoreline functions (Table 5-15).

Table 5-14. Summary of potential impacts from forest practices.

Functions	Potential Impacts to Functions
Hydrologic	Increased runoff and erosion, potentially leading to channel incision, head cutting, and/ channelization of a river.
Water Quality	Increase fine sediment to waterbodies resulting from sediment disturbance and loss of root stabilization.
Vegetative/ Habitat	Loss of vegetation and riparian habitat.

Table 5-125. Summary of key forest practices regulations that protect ecological functions.

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Development Standards	All forest practices in shoreline jurisdiction must comply with the State Forest Practices Act. 14.26.445(4)(a)	X	X	X	X

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	Conversion to non-forest uses is limited to the minimum area necessary. 14.26.445(4)(b)(ii)	X	X	X	X
	Ensure no net loss of shoreline ecological functions. 14.26.445(4)(b)(iii)	X	X	X	X

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

5.3.8 In-water structures

This analysis of potential in-water structure impacts collectively includes breakwaters, jetties and groins (14.26.425), as well as other instream structures (14.26.455). These structures are often intended to alter currents and deflect or dissipate wave energy. For this reason, in-water structures also have the potential to cause unintended impacts on natural sediment transport processes (Table 5-16). The proposed SMP establishes strict standards for permitting in-water structures, and in many environment designations, in-water structures are either prohibited or only allowed through a Shoreline Conditional Use Permit (SCUP) (Table 5-17).

Table 5-16. Summary of potential impacts from in-water structures.

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

Table 5-17. Summary of key in-water structure regulations that protect ecological functions.

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Shoreline Designation	Breakwaters, groins and jetties are prohibited in the Natural designation and on all lake shorelines. Table 14.26.405	X			X
	Breakwaters, jetties and groins are prohibited on all lake shorelines. Fixed breakwaters, jetties, and groins are only permitted in the High Intensity environment and are a conditional use in the Shoreline Residential environment on river and marine shorelines. Jetties and	X			X

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	groins are permitted as part of shoreline enhancement or protection as a conditional use in all other upland designations. Table 14.26.405				
	Floating breakwaters are prohibited on rivers and marine shorelines in the Natural designation and are a conditional in the Rural Conservancy, Urban Conservancy and Shoreline Residential designations. Table 14.26.405	X			X
General Standards	Channelization projects that result in a net loss of ecological functions or result in high flood stages and velocities are prohibited. 14.26.455(2)(a)(ii)	X	X	X	X
	The location, planning and design of in-stream structures must address protection and preservation of ecological functions and processes. 14.26.455(4)(a)(iv)	X	X	X	X
	Structures must be designed and located to minimize removal of riparian vegetation. 14.26.455(4)(b)			X	
	Diversion structures must be designed and located to return flow to the stream or river in as short a distance as possible. 14.26.455(4)(c)	X			X
	In-stream structures must provide for adequate upstream and downstream fish passage. 14.26.455(4)(d)				X
Breakwaters, Jetties, and Groins	New breakwaters, jetties and groins are prohibited in the following areas: lakes, shorelines where valuable geohydraulic or biological processes are sensitive to alteration or development; and areas that would result in an adverse impact on nearby properties. 14.26.425(2)(b)	X			X
	Repair and replacement of existing jetties and groins may be permitted if necessary to maintain existing functions and avoid significant impacts to life and property so long as the footprint of the structure is minimized to the greatest extent possible. 14.26.425(2)(c)	X			X
	An application for a breakwater, jetty, or groin must provide information on physical site characteristics, predicted impact on shore processes and upland stability, and a mitigation plan. 14.26.425(3)	X			X
	Breakwaters must be designed and constructed to protect critical areas and ecological functions. 14.26.425(4)(a)	X	X	X	X
	Breakwaters must minimize alterations to shoreline sand and gravel transport unless such impediment is found to benefit shoreline functions. The effect of proposed breakwaters on sand and gravel movement must be evaluated during permit review. 14.26.425(4)(b)	X			
	Breakwaters must be designed and constructed in a manner that minimizes significant adverse impacts on water circulation and aquatic life. 14.26.425(4)(c)	X	X		X

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

5.3.9 Mining

Large-scale mining has potential to significantly impact erosion and sediment transport processes, water quality, and nearshore habitat (Table 5-18). Any proposals for mineral extraction would require a SCUP, which requires that the project demonstrate no net loss on an individual and cumulative basis, and requires approval from Ecology. Proposals would be required to follow mitigation sequencing and to establish buffer zones, erosion control measures, and a follow a detailed reclamation plan (Table 5-19).

New mining operations are limited to areas identified in the Mineral Resource Overlay (MRO) of the County’s comprehensive plan; existing operations outside of the MRO may only expand if they obtain a special use permit per SCC 14.16.440. The MRO does not occur in shoreline jurisdiction on the Skagit River except in two locations: upstream from Mill Creek and upstream of the confluence of the Sauk River. MRO areas occur most commonly in shoreline jurisdiction in tributary streams of the Middle Skagit Management Unit. The MRO also includes shorelines in the lower Samish River, Pilchuck Creek, Nookachamps Creek, as well as the southwest shorelines of Baker Lake, the wetlands associated with Big Lake, and all of Day Lake. MRO areas occur exclusively in the Rural Conservancy environment.

Table 5-18. Summary of potential impacts from mining.

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

Table 5-19. Summary of key mining regulations that protect ecological functions.

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Shoreline Designation	Mining is prohibited in the Natural and Shoreline Residential environments; mining is a conditional use in all other environments. 14.26.405	X	X	X	X
General Standards	Mining in shoreline jurisdiction may be approved only when determined to be dependent on a shoreline location. 14.26.460(2)(a)	X		X	X
	On marine or lake shores, mining waterward of the OHWM is prohibited. 14.26.460(2)(b)	X	X	X	X
	On streams and rivers, mining waterward of the OHWM is prohibited unless it will not adversely affect ecological functions or processes. 14.26.460(2)(c)	X	X	X	X
	All new mining applications must include information on the proposed means of controlling surface runoff and preventing or minimizing sedimentation and erosion; quality analysis of overburden, excavation material, and tailings; and existing drainage patterns. 14.26.460(3)	X	X		
Operations	Accessory equipment and materials essential to mining operations in shoreline areas must be stored or sited as far landward from the OHWM as feasible. 14.26.460(4)(e)(i)		X		
	Mining operations must not impair lateral support or cause earth movements or erosion to extend beyond property lines or to adversely affect the shoreline and water environment. 14.25.460(4)(e)(iii)	X	X		X
	Mining activities must use effective techniques for preventing or minimizing adverse surface runoff, erosion, and sediment generation. 14.26.460(4)(e)(iv)		X		X
	Operations must not adversely affect water quality or quantity. 14.26.460(4)(e)(v)		X		
	The proposed subsequent use of mined property must be consistent with the environment designation in which the property is located and the reclamation of disturbed shoreline areas must provide appropriate ecological functions consistent with the setting. 14.26.460(4)(f)(i)	X	X	X	X
	Reclamation must be completed within one year of completion of mining activities. 14.26.465(4)(f)(ii)	X	X	X	X

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

5.3.10 Recreational Development

Skagit County shorelines offer several recreational opportunities, including federal, state, and county parks, as well as privately owned recreational lands. The potential impacts of recreational uses generally depend on the type and intensity of the use. Active uses, which may

require structural development such as boat ramps, boardwalks, and concession facilities, are expected to have a greater impact than passive uses, such as hiking trails. The proposed SMP includes provisions to ensure that both active and passive recreational uses result in no net loss of ecological functions (Table 5-21).

Table 5-20. Summary of potential impacts from recreational development.

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

Table 5-21. Summary of key recreational use regulations that protect ecological functions.

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Shoreline Designation	Water-oriented recreational development is a conditional use in the Natural environment. Table 14.26.405		X	X	X
	Nonwater-oriented recreational development is prohibited in the Natural environment, and is a conditional use in the Rural Conservancy and Urban Conservancy environments. Table 14.26.405		X	X	X
Development standards	Recreational development must be located outside of shoreline jurisdiction where feasible, or landward of water-oriented uses unless it can be shown that such facilities are shoreline dependent. 14.26.465(2)(a)		X	X	X
	All vehicle use in recreational development is prohibited in critical areas except for emergency or approved maintenance activities, boat launching, and the on and off loading of handicapped persons. 14.26.465(2)(b)(ii)		X	X	X
	Recreational developments requiring the use of fertilizers, pesticides, and herbicides must leave a chemical free swath at least 25 feet in width from water bodies and wetlands. 14.26.465(4)(d)(i)		X		

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

5.3.11 Residential Development

The following tables (Tables 5-22 and 5-23) describe the potential impacts of residential development and the SMP provisions that help ensure that those impacts are avoided, minimized, or mitigated to avoid a net loss of functions. Many shoreline modifications may be considered accessory to residential development; however, those modifications are addressed separately in the other subsections of Section 5.3, and not addressed in this subsection.

Table 5-22. Summary of potential impacts from residential development.

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

Table 5-23. Summary of key residential use regulations that protect ecological functions.

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Shoreline Designation	Natural: Multi-family development is prohibited and single family development is a conditional use. Table 14.26.405	X	X	X	X
	Rural Conservancy: Multi-family development is a conditional use. Table 14.26.405	X	X	X	X
General Standards	New over-water residences, including floating homes, are prohibited. 14.26.470(2)(c)		X		X
	Applications for new residential land divisions must include an evaluation of the clustering of lots to minimize physical and visual impacts on shorelines. 14.26.470(3)(a)		X	X	X

Type of Standard	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Development Standards	Plats and subdivisions must be designed, configured and developed in a manner that ensures no net loss of ecological functions from the plat or subdivision at full build-out of all lots. 14.26.470(4)(a)	X	X	X	X
	Residential development must be located and designed to avoid the need for flood hazard reduction facilities. 14.26.470(4)(b)	X			X
	The use of fill for expansion or creation of upland areas to support residential development is prohibited except for supporting infrastructure such as roads when there is no feasible alternative. 14.26.470(4)(c)	X	X		X

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

5.3.12 Shoreline Habitat and Natural Systems Enhancement Projects

The proposed SMP provides flexibility in the implementation of shoreline enhancement measures, yet it also provides some key standards to ensure that shoreline enhancement is conducted based on the best available scientific understanding and that projects are maintained and monitored to ensure long-term sustainability (Table 5-25). Several restoration projects are planned for near-term implementation throughout the County's shorelines (see Section 5.5).

Table 5-24. Summary of potential impacts from shoreline enhancement.

Functions	Potential Impacts to Functions
Hydrologic	Improve hydrologic connectivity
Water Quality	Water quality improvement
Vegetative/ Habitat	Improved shoreline habitat complexity
	Increased riparian cover and wildlife corridors

Table 5-25. Summary of key shoreline enhancement regulations that protect ecological functions.

Location in SMP	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
General Standards	All projects must protect the integrity of adjacent natural resources, including aquatic habitats and water quality. 14.26.475(4)(a)	X	X	X	X
	Long-term maintenance and monitoring is required 14.26.475(4)(b)	X		X	X
	Applicant must demonstrate that no significant change to sediment transport or river current will result and that the enhancement will not adversely affect ecological processes, properties, or habitat. 14.26.475(4)(c)	X	X	X	X
	Shoreline restoration and enhancement projects must be designed using the best available scientific and technical information, and implemented using best management practices. 14.26.475(4)(d)	X	X	X	X

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

5.3.13 Shoreline Stabilization

Shoreline stabilization structures are common features on the County's marine shorelines. Although new shoreline stabilization measures would be expected to be permitted relatively infrequently, repair and replacement of existing structures are expected to occur more commonly. Shoreline stabilization measures have potentially significant impacts on sediment transport processes, which in turn affect submerged aquatic vegetation and nearshore habitat functions (Table 5-26). The proposed SMP substantially limits the development of new shoreline stabilization structures by establishing strict permitting criteria. The proposed SMP further ensures that new and replacement structures evaluate and implement the stabilization approach with the least potential for impacts to shoreline functions (Table 5-27). Any new or replacement structure must ensure that no net loss of functions is achieved.

Table 5-26. Summary of potential impacts from shoreline stabilization.

Functions	Potential Impacts to Functions
Hydrologic	Increase in wave energy at the shoreline resulting in increased nearshore turbulence and uprooting of aquatic vegetation
	Disruption of shoreline wetlands
	Marine shorelines: impoundment of sediment recruitment from backshore areas alters sediment balance, resulting in coarsening of substrate and loss of eelgrass beds (particularly significant for historical feeder bluffs and accretion shoreforms)
Water Quality	Water quality impacts associated with construction
	Removal of shoreline vegetation increases erosion and water temperatures

Functions	Potential Impacts to Functions
Vegetative/ Habitat	Reduction in nearshore vegetation - loss of eelgrass beds associated with sediment coarsening
	Increased slope of the nearshore reduces shallow nearshore habitat area

Table 5-27. Summary of key shoreline stabilization regulations that protect ecological functions.

Location in SMP	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Shoreline Designation	New hard shoreline stabilization is prohibited in the Natural designation and a conditional use in other designations. Table 14.26.405	X			X
General Standards	New hard shoreline stabilization is not allowed, except when an analysis confirms it is required to protect an existing primary structure. 14.26.480(2)(a)	X			X
	In all cases, the feasibility of soft shoreline stabilization must be evaluated prior to a request for hard structural stabilization. 14.26.480(2)(b)	X			X
	New or enlarged stabilization structures are prohibited except: to protect an existing primary structure; in support of water-dependent or new non-water-dependent development when the erosion is not being caused by upland conditions, nonstructural measures are infeasible, and need is demonstrated; or to protect projects for the restoration of ecological functions or for hazardous substance remediation. 14.26.480(2)(c)	X			X
	Applications must include a geotechnical analysis prepared by a qualified professional, including an assessment of alternatives and of the anticipated effects. 14.26.480(3)(a)	X	X	X	X
	Applications for replacement of existing hard shoreline stabilization structures must include an assessment of the need for continued structural stabilization, an assessment of erosion potential, and recommendations for minimizing impacts. 14.26.480(3)(b)	X			X
Development Standards	New or expanded shoreline stabilization structures must include measures designed to address erosion impacts. 14.26.480(4)(a)	X	X		X
	Soft structural measures must be used to the maximum extent practicable. Where necessary, hard structures should be minimized. 14.26.480(4)(b)(i)	X			X
	Excavation and fill activities should be conducted landward of the existing OHWM to the maximum extent practicable. Where excavation and fill waterward of OHWM is necessary, sand, gravel, cobble, or boulders may be used, provided the placement of boulders does not effectively present a continuous wall or face to oncoming waves. 14.26.480(4)(b)(ii)	X			X

Location in SMP	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	Some fill waterward of the OHWM may be allowed to provide enhancement of ecological functions through improvements in substrate condition or gradient. 14.26.480(4)(b)(iii)	X	X		X
	All shoreline stabilizations measures must minimize and mitigate any adverse impacts to ecological functions. 14.26.480(4)(b)(iv)	X	X	X	X
	All new, expanded, or replacement hard structural measures must minimize long-term adverse impacts by a) minimizing the size of hard structures; b) shifting the hard structures landward or sloping it landward; and c) minimizing impacts to natural erosion and accretion areas. 14.26.480(4)(b)(v)	X	X	X	X
	New and expanded measures must mitigate any adverse impacts by a) restoring appropriate substrate conditions waterward of the OHWM; b) planting vegetation consistent with critical areas and vegetation conservation regulations; c) additional measures including removal of existing armoring. 14.26.480(4)(b)(vi)	X	X	X	X
	Shoreline stabilization measures must not significantly interfere with normal surface and subsurface drainage. 14.26.480(4)(b)(vii)	X			
	Shoreline stabilization measures must not extend waterward more than the minimum amount necessary to achieve effective stabilization, except for those elements that enhance shoreline ecological functions and minimize impacts. 14.26.480(4)(b)(xii)	X			X
Hard Structural Shoreline Stabilization Standards	When hard structural stabilization is proposed on a site where hard structural stabilization is not located on adjacent properties, construction must tie in with existing contours to avoid causing erosion of adjoining properties. 14.26.480(4)(c)(i)	X			
	When hard structural stabilization is proposed on a site where hard structural stabilization is located on adjacent properties, proposed stabilization may tie in flush with existing stabilization measures in order to connect with adjoining stabilization, and the remaining portion must be placed landward of the existing OHWM such that no net intrusion into the water body occurs nor does net creation of uplands occur. 14.26.480(4)(d)(ii)	X			X
	Fill behind hard structural shoreline stabilization must be limited to 1 cubic yard per running foot; any fill in excess of this amount will be regulated under provisions for Fill activities in this SMP. 14.26.480(4)(c)(iii)	X	X		X
	Replacement hard structural shoreline stabilization measures must not encroach waterward of the OHWM unless the primary residency was constructed prior to 1992, and there are overriding safety or environmental concerns. 14.26.480(4)(C)(iv)	X			X

Location in SMP	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Soft Structural Shoreline Stabilization Standards	Soft shoreline stabilization design must tie in with the existing contours of the adjoining properties to prevent erosion at the property line. 14.26.480(4)(d)(i)	X			X
	Soft shoreline stabilization design must size and arrange any gravels, cobbles, logs, and boulders so that the project remains stable during a two-year flood event on rivers and under typical boat- and wind-driven wave conditions on lakes, including storm events, and dissipates wave and current energy, without presenting extended linear faces to oncoming waves or currents. 14.26.480(4)(d)(ii)	X			X

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

5.3.14 Transportation and Parking

Roads, railroads, and parking areas are common features along the County’s shorelines. Roads, railroads, parking areas, and associated traffic tend to impair habitat and hydrologic connectivity, and stormwater runoff can have a substantial impact on water quality conditions (Table 5-28). Proposed SMP standards require that new primary roads, as well as parking areas, are constructed outside of shoreline jurisdiction where feasible (Table 5-29). As such, with the exception of driveways and access roads for new residential development, new roads are not anticipated in shoreline jurisdiction.

The proposed SMP would affect ongoing road maintenance within shoreline jurisdiction by requiring that roads are located, designed, constructed, and managed to ensure no net loss of shoreline ecological functions and processes (Table 5-29).

In addition to SMP standards that apply to road maintenance and improvements, planned road projects can reduce impacts on shoreline function. One example of such a planned road project is the installation of engineered logjams along the Skagit River just east of Rockport (WSDOT 2013). The large wood structures are intended to provide habitat and maintain the integrity of Highway 20. This project was completed in early 2014.

Table 5-28. Summary of potential impacts from transportation and parking facilities.

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

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

Table 5-29. Summary of key transportation and parking regulations that protect ecological functions.

Location in SMP	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Shoreline Designation	Natural: Transportation facilities other than trails are either prohibited or a conditional use. Table 14.26.405	X	X	X	X
General Standards	Transportation facilities (other than bikeways, trails, and equestrian trails) are prohibited within shoreline jurisdiction unless locating outside of shoreline jurisdiction is infeasible. 14.26.485(2)(a)	X	X	X	X
	When allowed, transportation facilities must be planned, located and designed to minimize possible adverse effects on unique or fragile shoreline features, achieve no net loss of shoreline ecological function, and set back from the OHWM to the maximum extent feasible. 14.26.485(4)(a)	X	X	X	X
Development Standards	Transportation facilities that are allowed over water bodies and associated wetlands must utilize elevated, open pile or pier structures and techniques. The number of water crossings must be the fewest necessary to serve the use or district. 14.26.485(4)(h)	X			X
	Bridge abutments and necessary approach fills must be located landward of associated wetlands or the OHWM for water bodies without associated wetlands. 14.26.485(4)(i)	X	X		X
	Fill, grading, and excavated materials from construction and maintenance activities must not be disposed in shoreline areas. 14.26.485(4)(b)	X	X	X	X
	Relief culverts and diversion ditches must not discharge onto erodible soils, fills, or sidecast materials. 14.26.485(4)(c)		X		X
	Mechanical means are preferred over the use of herbicides for roadside brush control. If herbicides are used, they must be applied so that chemical do not enter shoreline water bodies, or be certified for aquatic use. 14.26.485(4)(d)		X		
	Shared driveways are preferred where they result in less impervious area and thereby reduce potential adverse shoreline impacts. 14.26.485(4)(l)	X	X	X	X
Roads and Railroads	Roads and railroads must not measurably increase flood levels or profiles and must not restrict or otherwise reduce floodplain and floodway capacities. 14.26.485(4)(j)	X			X

Location in SMP	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Parking	New or expanded parking must be: a) located landward of the primary facility where feasible, , b) located outside of shoreline buffers, c) be accessory to an authorized use, d) minimize environmental and visual impacts, and e) be screened from view of shoreline by native vegetation . 14.26.485(4)(n)(ii)	X	X	X	X
	New parking facilitates are prohibited over water. 14.26.485(2)(b)		X	X	X
Float planes	Float plane facilities must be located to minimize noise impacts and other impacts on habitat areas of endangered or threatened species, environmentally critical and sensitive habitats, and migration routes on adjacent parcels and over-flight areas. 14.26.85(4)(o)(ii)	X	X	X	X

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

5.3.15 Utilities

Utility infrastructure is commonly needed as an accessory for other shoreline uses, particularly residential development. The proposed SMP requires that the highest impact utilities be located outside of shoreline jurisdiction when feasible. When allowed, the SMP includes standards for utilities which require avoidance of impacts to ecological function (Table 5-31).

Table 5-30. Summary of potential impacts from utilities.

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

Table 5-31. Summary of key utility infrastructure regulations that protect ecological functions.

Location in SMP	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Shoreline Designation	Any new utilities are a conditional use in the Natural and Aquatic designations. Table 14.26.405	X	X	X	X

Location in SMP	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
	New large utilities, hydropower, and tidal power are conditional uses in all environment designations. Table 14.26.405	X	X	X	X
General Standards	Transmission facilities, facilities that require period maintenance, and energy and communication systems must be located outside of shoreline jurisdiction whenever feasible. If not feasible, they must ensure no net loss of ecological functions and no significant adverse impacts to other shoreline resources and values that cannot be mitigated. 14.26.490(2)(a)	X	X	X	X
	New utilities must be located in existing rights of way and corridors whenever feasible. 14.26.490(2)(b)	X	X	X	X
Development Standards	All new facilities must preserve the natural landscape. 14.26.490(4)(a)(i)	X	X	X	X
	All new facilities must locate and design the project to avoid the need for new structural shoreline stabilization or flood hazard reduction facilities. 14.26.490(4)(a)(ii)	X	X	X	X
	All new facilities shall screen facilities from water bodies using native, self-sustaining vegetation. 14.26.490(4)(a)(iii)			X	
	All new facilities must avoid impacts to fish and wildlife habitat to the maximum extent possible. 14.26.495(4)(a)(v)				X
	For all new facilities, the utility installation must not change the natural rate, extent, or opportunity of channel migration. 14.26.490(4)(a)(vi)	X			
	All utilities for new subdivisions, mobile home parks, and recreation must be installed underground in shoreline areas. 14.26.490(4)(b)	X	X	X	X
Utility lines	Underground (or water) utility lines must enter and emerge inland from fresh and salt water banks, dikes, beaches, or shorelands; shorelands where such facilities enter or leave water bodies must be returned to their pre-construction conditions; and lines must be completely buried under the river bed in river or stream crossings except for bridges and water or sewer treatment plant intake pipes or outfalls. 14.26.490(4)(c)	X	X		X
	When surface utility lines are allowed in or across shoreline areas, the lines must minimize crossings of shoreline areas; use structural abutments or approach fills to set water crossings back from the OHWM; and utilize pier or open pile techniques only for permitted wetland crossings. 14.26.490(4)(d)	X			X
	Aerial utility lines must minimize shoreline area crossings and use existing crossings where feasible. 14.26.490(4)(e)(i)	X			X

Location in SMP	SMP Provision Providing Protection of Ecological Functions	Primary Function*			
		Hydrologic	Water Quality	Vegetation	Habitat
Outfalls	Surface water and stormwater outfalls shall be set back from the water's edge and discharged onto appropriate materials such as rocks, logs, and other natural materials; shall be designed and installed so that during periods of heavy rainfall the velocity and quantity of runoff will not be detrimental to important aquatic life in the receiving waters, and so that it does not flood adjacent land; and shall install vegetation consistent with 14.26.380, Vegetation Conservation. 14.26.490(4)(f)(ii-iv)	X	X		
Hydropower	Hydropower flowlines and powerhouses must be designed, located, and constructed in a manner that avoids extensive topographical alteration and avoids impacts to shoreline ecological function and critical areas. 14.26.490(4)(g)(i)	X			X
	Flowlines and powerhouses must be designed to minimize the removal of riparian vegetation and to return flow to the stream in as short a distance as practical. 14.26.490(4)(g)(ii)	X		X	X
	All intake and diversion structures must be designed to maximize the natural transportation of bedload materials to the greatest extent possible. 14.26.490(4)(g)(iv)	X			X
	Where site conditions permit, powerhouses must be located a minimum of 50 feet from the OHWM. 14.26.490(4)(g)(v)	X	X	X	X
	Impoundments must be located to minimize impacts to critical areas, shoreline natural features, and important scenic vistas. 14.26.490(4)(g)(vi)	X		X	X
Tidal Energy	Tidal and wave energy facilities must be installed so that water quality and marine life will not suffer degradation and that no net loss of ecological function will result. 14.26.490(4)(i)	X	X		X
Maintenance	Maintenance of existing utilities must: protect shoreline habitat; provide stormwater management; provide erosion and sediment control practices; provide for re-vegetation activities; and use best management practices for chemical applications. 14.26.490(4)(j)	X	X	X	X

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

5.4 Critical Areas

The proposed SMP requires that activities within shoreline jurisdiction comply with critical areas regulations found in Chapter 14.24 SCC, as well as specific standards of the proposed SMP (Part V).

5.4.1 General Provisions

In the proposed SMP, variances for critical areas within shoreline jurisdiction must be processed according to the procedures in Chapter 14.24 SCC. Variance applications must utilize the most current, accurate, and complete scientific and technical information available (14.26.510(2)). Project monitoring is required for individual restoration and mitigation projects (14.26.510(4)). SCC 14.24.080(5)(b) specifies the mitigation sequencing requirements required for all projects in critical areas, and this provision is referenced throughout the SMP.

5.4.2 Wetlands

Under the County's existing critical areas regulations (Chapter 14.24 SCC), wetland buffers range from 25 feet to 300 feet depending on the wetland rating and the intensity of proposed development (SCC 14.24.230(1)). Additionally, optional wetland buffers based on development intensity and habitat score may be used in place of standard buffers, provided a site assessment is completed by a qualified professional. Buffer averaging is allowed provided specific criteria are met, including that averaging will not degrade functions, and that the buffer width is not reduced below 75 percent of the standard buffer width (SCC 14.24.240(2)).

5.4.3 Flow-sensitive Basins

The following shoreline waterbodies have been identified as flow-sensitive basins (SCC 14.24.350):

- Alder Creek
- Aldon Creek*
- All Creek
- Anderson/Parker/Sorenson Creeks*
- Bacon Creek
- Barr Creek*
- Big Creek
- Boulder Creek
- Boyd Creek*
- Careys Creek*
- Carpenter/Fisher Creeks
- Childs/Tank Creeks*
- Clark Creek*
- Coal Creek*
- Corkindale Creek*
- Cumberland Creek
- Day Creek
- Diobsud Creek
- Everett Creek*
- Finney Creek
- Flume Creek*
- Friday Creek
- Gilligan Creek
- Grandy Creek
- Gravel Creek*
- Hansen Creek
- Hilt Creek*
- Hobbit Creek*
- Illabot Creek
- Irene Creek
- Jackman Creek
- Jones Creek
- Jordan Creek
- Loretta Creek*
- Mannser Creek*
- Mill Creek
- Miller Creek*
- Morgan Creek*
- Muddy Creek*
- Nookachamps Creek
- O'Brian Creek*

- O'Toole Creek
- Olson Creek
- Ossterman Creek*
- Prairie Creek*
- Presentin Creek
- Red Cabin Creek*
- Rocky Creek
- Salmon/Stevens Creek*
- Savage Creek*
- Stillaguamish River and tributaries
- Sutter Creek*
- Tenas Creek
- White Creek*
- Wiseman Creek*

* These are not shoreline waterbodies, but they pass through shoreline jurisdiction as tributaries of shoreline waterbodies

In addition to limits on groundwater withdrawal in flow-sensitive basins, the maximum allowed impervious surface area of new development within flow-sensitive basins is 20 percent, unless stormwater mitigation measures are taken, or it is demonstrated that the proposed project will not affect stream base flows (SCC 14.24.360).

5.4.4 Aquifer Recharge Areas

Designated aquifer recharge areas are determined to be critical in maintaining both groundwater quantity and quality. The County's critical areas regulations prohibit certain uses within aquifer recharge areas, including landfills, underground injection wells, wood treatment facilities, and chemical storage or disposal facilities (SCC 14.24.320). Applicants for development within an aquifer recharge area must perform a hydrogeological site assessment (SCC 14.24.330). For proposals requiring mitigation for adverse impacts, a mitigation plan must also be provided. The mitigation plan must be specific to the type of impacts expected and must include plans for environmental monitoring and contingency (SCC 14.24.340(1)).

The regulations also designate surface water source limited streams. If a proposed project is located within one-half mile of any of these streams, total impervious surface area is limited to five percent of the total project area, unless mitigation for groundwater infiltration is provided on site (SCC 14.24.340(3)).

5.4.5 Fish and Wildlife Habitat Conservation Areas

Fish and Wildlife Habitat Conservation Areas (FWHCA) apply to all waters of the state (SCC 14.24.500). Critical saltwater habitats are included as fish and wildlife habitat conservation areas per SMP section 14.26.550(2). Applicable standard buffer widths for FWHCAs are based on environment designation for lakes and marine waters, and a set 200-foot buffer applies to shoreline streams and rivers (Table 5-30) (SMP Table 14.26.310-1).

Table 5-13. Proposed Shoreline buffers

Marine and Lake Shoreline Environment Designations	Shoreline Buffer
Natural	200 feet
Rural Conservancy- Skagit Floodway	NA*
Rural Conservancy	150 feet
Shoreline Residential	100 feet
Urban Conservancy	150 feet
High Intensity	140 feet
Streams and Rivers Shoreline Environment Designations	Shoreline Buffer
All shoreline streams and rivers	200 feet

* No areas of marine or lake shorelines are proposed as Rural Conservancy- Skagit Floodway designation.

Non-shoreline stream buffers range from 50 feet on non-fish bearing streams to 150 feet for fish-bearing streams. Buffer averaging is allowed provided specific criteria are met, including that averaging will not degrade functions, and that the buffer will not be reduced below 75 percent of the standard buffer width. Any impacts of buffer reduction must be mitigated.

On rivers and streams, limited timber harvest is allowed within shoreline buffers, provided that along shoreline watercourses buffers maintain 95 percent of potential large woody debris (LWD) recruitment, 85 percent of trees over 24 inches diameter at breast height (DBH), and an average canopy cover of 75 percent (SCC 14.24.540(5)).

5.4.6 Frequently Flooded Areas

Frequently flooded areas are regulated by the County's Flood Damage Prevention standards (Chapter 14.34 SCC), which are incorporated into the County's critical areas regulations by reference. These regulations establish a "protected review area," which applies to development within the floodway, the riparian habitat zone (RHZ), and the channel migration area (CMA). The RHZ applies to all lands within 250 feet of all waters of the State, and the CMA includes any areas where the channel migration zone has been mapped, plus an additional 50 feet, except that the CMA boundary ends at any Corps-maintained levee (SCC 14.34.055).

Consistent with the requirements of the 2008 Biological Opinion on the Federal Emergency Management Agency's Flood Insurance Program in Puget Sound, the County's Flood Damage Prevention regulations require the following (SCC 14.34.150):

- Site structures outside of the special flood hazard area where feasible;
- Address potential stormwater impacts through low impact development;
- Limit impervious surface area (limit of 10 percent increase, unless there is no increase in the rate and volume of stormwater surface runoff);

- Avoid or compensate for any loss of floodplain storage.

Development within the protected review area requires preparation of a Fish and Wildlife Habitat Conservation Area (FWHCA) site assessment to demonstrate that the project avoids, minimizes, and mitigates for impacts on federally listed salmon and orcas. Development within the floodplain will require preparation of a habitat impact assessment checklist, which the County will use to determine whether a FWHCA site assessment will be required (SCC 14.34.220).

Flood regulations further prohibit any development within the floodway that would increase the base flood elevation, the regulations limit development in the floodway and help maintain flood storage capacity functions (SCC 14.34.190).

5.4.7 Geologically Hazardous Areas

Regulations specific to geologically hazardous areas apply performance standards to minimize and manage risks and ecological impacts. Geologically hazardous areas include erosion hazard areas, landslide hazard areas, seismic hazard areas, volcanic hazard areas, and mine hazard areas (SCC 14.24.410).

Properties containing geologically hazardous conditions shall require a geologically hazardous area mitigation plan (SCC 14.24.430). For all landslide and erosion hazard areas, a vegetated buffer of at least 30 feet from the top, toe, and all edges of the slope of the slope is required, except that a minimum buffer of 50 feet is required if the vertical relief of these hazard areas is over 50 feet (SCC 14.24.430(1)(g)). The buffer may be increased for development adjacent to an unstable marine bluff or ravine. The buffer may be decreased to a minimum of 10 feet only no reasonable alternative exists and a geotechnical report demonstrates that a lesser distance will protect the proposed development, geologic stability, and other critical areas (SCC 14.24.430(2)).

5.5 Shoreline Restoration Plan

As discussed above, one of the key objectives that the SMP must address is “no net loss of ecological shoreline functions necessary to sustain shoreline natural resources” (Ecology 2011). Although the implementation of restoration actions to restore historic functions is not required by SMP provisions, the guidelines state that “master programs shall include goals, policies and actions for restoration of impaired shoreline ecological functions. These master program provisions should be designed to achieve overall improvements in shoreline ecological functions over time, when compared to the status upon adoption of the master program” (WAC 173-26-201(2)(f)). Pursuant to that direction, the County prepared the Shoreline Restoration Plan (TWC 2014, amended 2016), which identifies opportunities for voluntary restoration, enhancement, and protection actions.

The Restoration Plan represents a long-term vision for restoration that will be implemented over time, resulting in a gradual improvement over existing conditions. Although the SMP is intended to achieve no net loss of ecosystem functions through regulatory standards,

practically, despite required practices to follow mitigation sequencing to avoid, minimize, and compensate for impacts on a site-specific scale, an incremental loss of shoreline functions may still occur at a cumulative level. These losses may occur through minor, exempt development, illegal development, failed mitigation efforts, or a temporal lag between the loss of existing functions and the realization of mitigated functions. The Restoration Plan, and the voluntary actions described therein, can be an important component in making up that difference in ecological function that would otherwise result.

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

- Site specific projects to restore ecological processes and eliminate barriers. Projects include, among others:
 - Restoring tidal connectivity in estuaries by replacing culverts with bridges;
 - Removal of shoreline armoring;
 - Improving fish passage by replacing culverts on streams and lakes;
 - Stormwater treatment facilities and stormwater retrofits; and
 - Floodplain restoration and restoration of instream complexity.
- Where existing systems are largely intact, protecting those intact processes and functions.
- Using programmatic approaches and teaming with key partners in education and outreach, as well as project implementation.
- Identifying and applying for available funding to implement projects.

Table 5-14. Restoration projects likely to occur on Skagit County shorelines in the foreseeable future.

Management Unit	Project	Status
Samish Island, Padilla Bay, and East side Swinomish Channel	Remove Spartina colonies	Ongoing
	Bayview Stormwater Management: Conduct capital improvements and stormwater management strategies from the Bayview Watershed Stormwater Management Plan.	Feasibility
Fidalgo Island and Other Islands	Fidalgo Island Stormwater Management: Conduct project recommendations from the South Fidalgo Stormwater Management Plan.	Feasibility
Skagit Bay Delta	Deepwater Slough-Phase 2: Complete removal of dikes around each of the two islands of diked, farmed and managed wetland left after Phase 1.	Phase 1 Complete; Phase 2 Conceptual
	Fir Island Farms Estuary Restoration (Davis/Dry Slough): 5,800 foot long coastal dike setback to restore 126.6 acres of tidal marsh.	Design/ Permitting

Management Unit	Project	Status
	McGlinn Island Causeway: Improve the hydraulic connection between the North Fork of the Skagit River and the Swinomish Channel north of McGlinn Island.	Feasibility
	Blake's Bottleneck, Thein Farm, Rawlins Road Dike Setback: Setback levees to create additional emergent marsh and riverine wetlands.	Design/Permitting
Lower Skagit Diking Districts	Britt Slough: Re-establish a historic riverine wetland and examine potential for a distributary connection to the mainstem.	Feasibility Complete
Samish River	Clean Samish Initiative: Samish Pollution Identification and Correction Program (PIC): Identify and correct sources of bacterial contamination in the watershed through intensive monitoring, incentives, compliance and enforcement, and a comprehensive education program.	Underway
	Fish Passage Projects: Correct priority fish passage barriers in Skagit County.	Underway
	Samish River Knotweed Control: Continue program to identify and treat knotweed infestations in the Samish River Basin.	Ongoing
Middle Skagit	Cumberland Creek Mitigation: Restore Cumberland Creek to a historic channel; reconnect to Skagit River floodplain.	Underway
	Cockreham Island: Evaluate and implement habitat restoration at Cockreham Island just downstream from the Town of Hamilton.	Feasibility
	Robinson Park Orphan Rock Removal Restoration: Remove bank hardening on approximately 2300 feet of Skagit River.	Underway
	Hansen Creek Reach 5 Acquisition and Restoration: Restore channels and wetlands to more natural configurations; set back flood control berms to restore floodplain connectivity; install culverts or bridges through SR 20.	Design/Permitting
	Skiyou Island Rock Removal: remove rip-rap that has altered the natural migration of the channel of the Skagit River; install approximately 2,400 linear feet of livestock exclusion fencing and native vegetation.	Project timeframe is identified as short-term
	Little Baker Channel: increase freshwater rearing habitat by constructing a side channel on the right bank of the Baker River, which would connect the Skagit River through the relic Little Baker channel	Conceptual- long term
	Illabot Creek Alluvial Fan Restoration: Construct two bridge crossings; remove left bank dike; excavate pilot channels; install log jam habitat features to direct flow into the historic channel.	Underway

Management Unit	Project	Status
	Savage Slough Restoration: Acquire and restore approximately 212 acres along the Skagit River.	Underway
	Barnaby Reach Restoration: Pursue alternatives for improving habitat conditions, restoring natural processes, and reducing maintenance costs.	Feasibility
	Upper Skagit Floodplain Restoration: Conduct small scale restoration in the floodplains of the Upper Skagit, Sauk, Suiattle and Cascade Rivers.	Feasibility Complete
	Finney Riparian: Restore conifers to the Finney Creek riparian forest and add large woody debris to the stream.	Feasibility Complete
	Upper Skagit Knotweed Project: Control invasive knotweed in Upper Skagit river basin.	Underway
Nooksack	Larson's Floodplain Refuge Project: Improve connectivity with cool water side-channel.	Preliminary Design
	Fish Passage Projects: Correct priority fish passage barriers in Skagit County.	Underway

6 EFFECTS OF OTHER REGULATORY PROGRAMS

6.1 County Regulations and Programs

6.1.1 Skagit County Zoning Code

Chapter 14.16 of the Skagit County Code provides zoning standards that direct uses, building bulk, scale, and location, and other design considerations throughout the County.

Zoning standards help ensure that open space is maintained on natural resource lands. Minimum lot sizes in Natural Resource Lands range from 20 to 80 acres, with the option to consolidate development density to retain open space.

6.1.2 Skagit County Stormwater Management

The County's Stormwater Drainage regulations are found in SCC 14.32.080. The regulations establish minimum requirements for control, treatment, and detention of stormwater runoff for developments adding over 5,000 square feet of impervious surface, disturbing more than one acre of land, or grading over 500 cubic yards of material. The County regulations also require implementation of BMPs from Ecology's latest Stormwater Management Manual for Western Washington for development exceeding the above criteria.

6.1.3 Hamilton Comprehensive Plan and Public Development Authority

The Town of Hamilton's 1994 Comprehensive Plan outlines a plan to reduce development in the approximately 300 acres within the Skagit River floodway. The floodway area would be restored for fish and wildlife habitat, and the town would be relocated out of the floodway. The Hamilton Public Development Authority (PDA) was established in 2005 to assist in moving Town facilities, infrastructure and residences out of the floodway within the Town limits and in unincorporated Skagit County. The Hamilton PDA created the Skagit County Floodway Mitigation and Hamilton Relocation Program to address repetitive losses from flood-prone areas of the County and enhance riparian resources.

6.2 State Agencies/Regulations

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

Depending on the nature of the proposed development, State regulations can play an important role in the design and implementation of a shoreline project, ensuring that impacts to shoreline functions and values are avoided, minimized, and/or mitigated. During the comprehensive SMP update, the County will consider other State regulations to ensure consistency as appropriate and feasible with the goal of streamlining the shoreline permitting process. A summary of some of the key State regulations and/or State agency responsibilities follows.

6.2.1 Washington Department of Natural Resources

Washington Department of Natural Resources (WDNR) is charged with protecting and managing use of State-owned aquatic lands. Toward that end, water-dependent uses waterward of the ordinary high water mark require review by WDNR to establish whether the project is on State-owned aquatic lands. If the use is on state-owned aquatic lands and WDNR determines the use is of statewide value, the agency will enter into a lease, easement, or other contract to authorize that use. In turn, WDNR relies on SMP updates as the primary means for identifying and providing appropriate uses of statewide value. Certain project activities, such as single-family or two-party joint-use residential piers, on State-owned aquatic lands are exempt from these requirements. WDNR recommends that all proponents of a project waterward of the ordinary high water mark contact WDNR to determine jurisdiction and requirements.

6.2.2 Washington Department of Ecology

The Washington Department of Ecology may review and condition a variety of project types, including any project that needs a permit from the U.S. Army Corps of Engineers (see Section 6.3), any project that requires a SCUP or Shoreline Variance, and any project that disturbs more than 1 acre of land. Project types that may trigger Ecology involvement include pier and shoreline modification proposals and wetland or stream modification proposals, among others. Ecology's three primary goals are to: 1) prevent pollution, 2) clean up pollution, and 3) support sustainable communities and natural resources (<http://www.ecy.wa.gov/about.html>). Their authority comes from the State Shoreline Management Act, Section 401 of the Federal Clean Water Act, the Water Pollution Control Act, the Federal Coastal Zone Management Act of 1972, the State Environmental Policy Act, the Growth Management Act, and various RCWs and WACs of the State of Washington.

6.2.3 Washington Department of Fish and Wildlife

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

6.2.4 State Forest Practices Act

Activities related to growing, harvesting, or processing timber are regulated under Washington's State Forest Practices Act (WAC 222) administered by Washington State DNR and are not regulated under the SMA unless the land is being converted to another use besides growing trees or the commercial harvest is within 200 feet of a shoreline of statewide significance and exceeds the harvest limits established in the SMA. Conversions must comply with the provisions in the SMP for the new use.

6.2.5 Surface Mining Act

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

- Segmental or progressive reclamation;
- Preservation of the topsoil;
- Slope restoration such that high-walls are rounded in plan and section for all mines;
- Stable slopes;

- Final topography that generally comprises sinuous contours, chutes and buttresses, spurs, and rolling mounds and hills, all of which blend with adjacent topography to a reasonable extent; and
- Effective revegetation with native multi-species ground cover and trees depending on the municipality-approved subsequent use designated for the site.

6.3 Federal Agencies/Regulations

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

6.3.1 Clean Water Act, Section 404

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

Section 303(d) of the Clean Water Act requires the state to develop a list of waters that do not meet water quality standards. A Total Maximum Daily Load, or TMDL, must be developed for impaired waters. Ecology is working with the County and other partners to implement water quality improvement projects as a part of TMDLs. Total Maximum Daily Loads have been established for the following waterbodies and water quality parameters in Skagit County. A description of the status of each TMDL is provided below.

Table 6-1. TMDL waterbodies and summary of water quality improvement status.

Waterbody Name	Pollutants	Status
<ul style="list-style-type: none"> • Campbell Lake • Erie Lake 	Total Phosphorus	Treatments were applied to the lake for phosphorus control. Monitoring showed that the process was a success, but must be repeated on a recurring basis to maintain the water quality standard.
<ul style="list-style-type: none"> • Samish Watershed 	Fecal Coliform	Ecology completed a study of the Samish watershed to determine the sources of bacteria and develop a plan for cleanup. Skagit County monitoring of the river during storm events suggests that the load carried by the river has decreased over the past four years.
<ul style="list-style-type: none"> • Carpenter Creek • Fisher Creek • Fisher Slough • Nookachamps Creek 	Fecal Coliform	The TMDL determined wasteload allocations (WLAs) for dischargers covered by a national pollution discharge elimination system (NPDES) permit, and load allocations (LAs) for the part of the river upstream of Sedro-Woolley.
<ul style="list-style-type: none"> • Carpenter Creek • Fisher Creek • Hansen Creek • Red Creek • Nookachamps Creek • Turner Creek • Lake Creek • Otter Pond 	Temperature	Ecology and a local advisory committee developed a Water Quality Improvement Report (WQIR). The report describes recommendations for reducing water temperatures. It proposes a strategy of outreach, education, and financial and technical assistance to private landowners to encourage them to increase riparian shading along these creeks.

6.3.2 Rivers and Harbors Act, Section 10

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

6.3.3 Federal Endangered Species Act (ESA)

Section 9 of the ESA prohibits “take” of listed species. Take has been defined in Section 3 as: “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct.” The take prohibitions of the ESA apply to everyone, so any action of the County that results in a take of listed fish or wildlife would be a violation of the ESA and exposes the County to risk of lawsuit. Per Section 7 of the ESA, the Corps must consult with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service on any projects that fall within Corps jurisdiction (e.g., Section 404 or Section 10 permits) that could affect species listed under the Federal Endangered Species Act. These agencies ensure that the project includes

impact minimization and compensation measures for protection of listed species and their habitats.

6.3.4 National Pollutant Discharge Elimination System (NPDES)

As a component of the Clean Water Act, in Washington State, the Department of Ecology has been delegated the responsibility by the U.S. Environmental Protection Agency for managing implementation of the NPDES program. The County is engaged in compliance with the NPDES Phase II municipal stormwater general permit requirements that address stormwater system discharges to surface waters. The County has developed an interlocal agreement with the Skagit Conservation District (SCD) to meet many of the Phase II Permit education and outreach requirements. The SCD programs focus on the general public, residents/ homeowners, businesses, developers, contractors, engineers and some industries, and include but are not limited to:

- General outreach
- Storm drain labeling
- Watershed Masters Volunteer Training Program
- Volunteer Water Quality Monitoring Program
- Stormwater Education Program for Local Businesses
- Backyard Conservation Stewardship Program
- Resource Materials and Education for Local Schools
- Stormwater Poster Contest for Local Youth
- Creation and Distribution of Stormwater Educational Brochures
- Educating the public on the impacts of outdoor car washing, and providing car wash kits for charity car wash fundraisers

6.3.5 Wild and Scenic Rivers Act

On November 10, 1978, Congress amended the 1968 Wild and Scenic Rivers Act to designate 158.5 miles of the Skagit River and portions of its Cascade, Sauk, and Suiattle tributaries, as part of the National Wild and Scenic Rivers System. The Outstandingly Remarkable Values of the Skagit River System are fisheries, wildlife, and scenic quality. Designated rivers are classified as either Wild, Scenic, or Recreation depending on the type and intensity of development. Illabot Creek above Rockport-Cascade Road was designated as a Wild and Scenic River in December 2014.

7 SUMMARY POTENTIAL FOR CUMULATIVE IMPACTS

As discussed previously, WAC 173-26-186(8)(d) directs local SMPs to evaluate and consider cumulative impacts of “reasonably foreseeable future development on shoreline ecological

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

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

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

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

7.1 Marine Shorelines

7.1.1 Natural

Anticipated development in the Natural environment is limited, and proposed SMP standards further limit the type of development that may occur in the Natural designation. Proposed 200-foot buffers in the Natural designation significantly limit new development within shoreline jurisdiction, such that nearly all development would occur outside of shoreline areas. Additionally, where bluffs occur within the Natural designation, development could be further restricted by Geologically Hazardous Areas buffers.

Any new park facilities would need to follow SMP vegetation conservation standards and stormwater standards to avoid a net loss in shoreline functions. Residential development is not anticipated in the Natural environment, and any residential development that is proposed would require a SCUP and would need to demonstrate that no net loss of functions would be achieved on an individual basis.

Estuarine restoration is also planned in the Natural designation. Restoration work has begun on a levee setback project at the WDFW-owned Fir Island Farm site. The project will restore 130 acres of tidal marsh habitat. The project began in May of 2015 and is expected to be completed by fall of 2016. Additional delta restoration at Deepwater Slough could also be pursued in the future.

Given the limited development anticipated and the standards imposed by the proposed SMP, as well as the improvements in marine and estuarine processes and functions expected to result from planned restoration of shoreline habitats in the Natural environment, a net improvement in shoreline functions is anticipated.

7.1.2 Rural Conservancy

Although there is significant potential for development of vacant lands on marine shorelines in the Rural Conservancy designation, many of these lands are in agricultural use, and likely to remain under agricultural production. Where development does occur, potential impacts will be limited through several proposed provisions in the SMP, including critical area buffer standards, stormwater management standards, and provisions relating to overwater structures and shoreline stabilization measures.

In the Rural Conservancy environment, standard buffer widths of 150 feet would ensure that shoreline vegetative and water quality functions are maintained. In several areas within the Rural Conservancy environment, development is further constrained by the presence of steep slopes and wetlands and the critical area provisions that would apply to those areas.

Proposed regulations in the Rural Conservancy environment are expected to ensure that the shoreline buffer remains functional with regard to vegetative, habitat, water quality, and hydrologic functions. Where lots are presently undeveloped, upland vegetation conservation standards will ensure that impacts to vegetation and associated habitat functions are avoided and minimized to the maximum extent practicable. Any subdivision of property must ensure that the resulting lots will not require shoreline stabilization and that any impacts of development are fully mitigated. Stormwater regulations will further limit potential impacts on water quality in the nearshore environment.

Many of the marine shorelines in the Rural Conservancy environment are protected by dikes. Diking districts are responsible for ongoing dike maintenance and repairs. The proposed SMP allows for the maintenance and repair of existing dikes without significant requirements; however, if dike replacement is warranted, the SMP standards for new shoreline stabilization would need to be met, including minimization and mitigation for any ecological impacts.

In addition to potential developable lands, the Rural Conservancy environment includes significant marine shorelands in park uses, including Larrabee State Park, Bay View State Park, and Deception Pass State Park. SMP provisions will ensure that any parks development projects will have no net loss of ecological function. Voluntary restoration activities recently completed or planned for the near future in the Rural Conservancy environment include water quality efforts, including the Clean Samish Initiative and stormwater management improvements.

If impacts remain despite minimization and mitigation measures, ongoing and planned voluntary restoration activities are expected to provide significant ecological lift to the nearshore environment by restoring estuarine processes and habitat, water quality, and

hydrologic functions. In summary, no net loss of ecological functions is anticipated in the marine Rural Conservancy environment.

7.1.3 Shoreline Residential

Potential impacts from development would be minimized by the large shoreline buffer standards and stormwater management standards. Impacts from overwater structures and shoreline stabilization measures would follow mitigation sequencing per Section V of the SMP, to avoid, minimize, and mitigate impacts.

A proposed standard buffer width of 100 feet is near the upper end of the range of existing buffers in the Shoreline Residential designation. Where existing residential setbacks lack significant native vegetation, a reduced buffer width (up to 25 percent reduction) may allow for improved shoreline functions when accompanied by native riparian restoration.

Shoreline residential development around bluffs will require an evaluation by a qualified professional to determine the appropriate structural setback for residential development and accessory structures. Critical area buffers will require that vegetated buffers are maintained on all sides of unstable slopes.

New mooring buoys and piers may be anticipated with new residential development. Repair and replacement of piers may also be anticipated. New development will be required to evaluate the potential for joint-use overwater structures or lower-impact structures, such as moorage buoys. New overwater structures will also require mitigation for any impacts to shoreline functions. As existing piers are replaced, they will need to incorporate grated decking, eliminate any existing skirting, and comply with materials and width guidelines, each of which are expected to minimize habitat impacts in this protected bay.

Existing conditions in the shoreline residential designation on marine shorelines include limited areas of bulkheads. SMP provisions would limit the potential for new shoreline stabilization, but existing shoreline stabilization measures could be replaced over time. As bulkheads are replaced, property owners will need to first assess the feasibility of lower impact stabilization measures, including non-structural or soft-structural approaches.

In summary, proposed SMP provisions regulate new development and redevelopment of existing uses and structures so that despite potential increases in impervious surfaces and overwater cover associated with new development, shoreline vegetation functions are likely to be maintained. Furthermore, planned stormwater management facilities should maintain water quality conditions.

7.1.4 High Intensity

Existing conditions in the High Intensity environment designation are impacted by existing industrial uses and/or roads along the shoreline. Any new commercial or industrial development would need to mitigate for any potential impacts and demonstrate no net loss of functions. Shoreline buffer standards of at least 140 feet and wetland buffers, as well as

standards encouraging integration of restoration opportunities with development, are expected to maintain or improve existing functions in the High Intensity designation.

7.2 Freshwater

7.2.1 Rivers and Streams

Residential development capacity shown in Table 4-1 indicates that there is significant residential development potential in the Middle and Upper Skagit Management Units. As noted in Section 4, this analysis over-estimated development in shoreline jurisdiction because it included the full development capacity of any lots (including large forest lots) that partially extend within jurisdiction. Furthermore, given the 200-foot standard buffer on river and stream shorelines and strict floodway development standards, potential development is primarily limited to portions of lots that fall outside of shoreline jurisdiction. Development could occur in shoreline jurisdiction if a 25 percent buffer reduction were permitted; however, in such a case, mitigation sequencing would be required, including enhancement of the existing buffer to result in equal or greater protection of shoreline functions.

Stormwater standards apply throughout the County and are not limited to shoreline jurisdiction. Additionally, many of the shoreline areas with vacant, developable lands occur in flow sensitive basins, where new groundwater withdrawals are restricted and where impervious surface coverage is limited to 20 percent of the land area. Together, these standards will help ensure that upland development will not adversely affect water quality or quantity in shoreline waterbodies.

Significant restoration is planned and underway in the streams and rivers of Skagit County. Near-term restoration efforts will be focused on restoring floodplain connectivity, restoring large woody debris functions and recruitment potential, improving water quality in more developed shorelines, and reducing the impacts of forest and county roads on shoreline functions and processes.

Given the significant limitations on new development along streams and rivers in Skagit County, as well as the significant restoration actions planned for the near future, an improvement in shoreline functions is anticipated.

7.2.2 Lakes

Development on the County's lake shorelines will likely be limited to new residential development on a few lakes. In every lake where new residential development is anticipated, this development will occur as infill of existing residential development. In addition to new development, redevelopment of existing residential uses may occur. Development on lake shorelines is likely to occur in the Shoreline Residential and Rural Conservancy designations, where standard buffers are 100 or 150 feet. These buffers are at the upper end of existing development, and are expected to be sufficient to maintain shoreline functions. Where lands are presently undeveloped, vegetation conservation standards that require that vegetation

clearing will be limited to the minimum necessary and that prioritize retention of significant native trees.

Provisions that limit the dimensions of overwater structures and ensure that potential impacts to aquatic species are minimized (e.g., grated decking standards and pile standards) will also apply to lake shorelines.

The proposed SMP requires that new development must ensure that shoreline stabilization measures will not be required. As bulkheads are replaced, property owners will need to first assess the feasibility of lower impact stabilization measures, including non-structural or soft-structural approaches. These approaches may be particularly feasible on smaller lakes without significant wave activity.

In summary, residential development is anticipated on the County's lake shorelines, and is likely to occur primarily through infill development. Shoreline buffers, combined with stormwater and septic standards are expected to be sufficient to maintain existing vegetative and water quality conditions. Pier and bulkhead regulations will ensure that as redevelopment occurs, existing impacts are minimized to the extent feasible.

8 NET EFFECT ON ECOLOGICAL FUNCTION

This CIA indicates that future growth is likely to be targeted in specific environment designations, waterbodies, and marine shoreline reaches. Future development has the potential to impact specific shoreline functions. This analysis can help inform the County of potential future shoreline impacts and the importance of specific proposed SMP provisions.

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

As discussed above, major elements of the SMP that ensure no net loss of ecological functions fall into four general categories: 1) environment designations (Part II), 2) general policies and regulations (Comprehensive Plan element and Part III), 3) shoreline use and modification provisions (Part IV), 4) critical areas regulations (Part V). The Shoreline Restoration Plan identifies ongoing and planned voluntary restoration that will provide an opportunity to improve shoreline conditions over time.

Environment designations: The Shoreline Analysis Report provided the information necessary to assign environment designations by segment to each of the shoreline waterbodies (see **Part II of the SMP**).

General provisions: **The Comprehensive Plan element of the SMP** contains a number of goals and policies pertaining to the protection and restoration of ecological functions. **Part III of the SMP** includes regulations relating to the adopted policies. These regulations include provisions that provide the basis for achieving no net loss of shoreline functions, such as mitigation sequencing, vegetation conservation standards, and critical areas regulations.

Shoreline modification and use provisions: **Part IV of the SMP** contains a number of regulations that contribute to protection and restoration of ecological functions. Shoreline uses and modifications were individually determined to be either permitted (as substantial developments or conditional uses) or prohibited in each environment designation. The most uses and modifications are allowed in areas with the highest level of existing disturbance.

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

Critical Areas Regulations: The County's critical areas regulations (Chapter 14.24 SCC) apply within and outside of shoreline jurisdiction. These regulations are amended in the proposed SMP (Part V, Critical Areas) for application to shoreline areas. Critical area regulations ensure that vegetated buffers are retained on wetlands, fish and wildlife habitat areas (including all shorelines), and geological hazard areas. The County's flood hazard regulations require that vegetation, flood capacity, and water quality are maintained, and that where feasible, buildings are located outside of the floodway. Combined these regulations help ensure that the most sensitive areas of the County's shorelines are protected.

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

In summary, key features identified in the proposed SMP and this evaluation that protect and enhance shoreline ecological functions are identified in Table 7-1.

Table 7-1. Key features of the proposed SMP to achieve no net loss of shoreline ecosystem functions.

SMP Actions to Maintain Shoreline Functions	Voluntary Actions to Restore Degraded Shoreline Functions and Processes
The County established a 200-foot buffer on all rivers and streams designated as shorelines of the state. This provision provides for protection of existing stream functions.	Planned restoration along the shorelines of the County will help identify and prioritize opportunities to restore shoreline ecological functions.
Standard buffers that apply to marine and lake shorelines are based on environment designations, and are sufficiently conservative with respect to existing development to maintain existing shoreline functions.	
Regulations focus development and growth in areas that are already developed, while protecting those areas that are ecologically intact or otherwise sensitive to development pressures. The County’s undisturbed shorelines were designated as Natural, and it is anticipated that adequate standards will provide the necessary protection of those areas in shoreline jurisdiction. The Natural environment includes many of the most sensitive and unique shoreline conditions and shoreforms in the County.	
SMP provisions require any projects with potential for significant adverse ecological effects to follow mitigation sequencing to avoid, minimize and mitigate any anticipated impacts.	
Emphasis is placed on achieving no net loss of shoreline ecological functions throughout shoreline jurisdiction.	

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

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