FINAL
August 2011

Shoreline Cumulative Impact Analysis
Town of Bucoda

Thurston Regional Planning Council

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About This Report

Consistent with Governor Gregoire's Plain Talk Executive Order 05-03 (2005), this report is written in a manner that is brief and to-the-point, uses non-bureaucratic language and features a clean design that promotes fast scanning and reading.

Scientific and legal references are kept to a minimum, replaced by a full list of sources in the report appendix.

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I. Introduction

A. Background

This report is the cumulative impacts analysis for the Town of Bucoda and its urban growth area. The analysis is meant to provide a planning-level framework for understanding how and where shoreline ecological functions are anticipated to be affected by future development and whether this development will cause a net loss of shoreline functions in the Town.

B. Timeline

The report has been created as part of the Shoreline Master Program (SMP) update and is included in Phase 4 of the overall update. A timeline for the complete SMP update is shown below:

TABLE 1: TIMELINE FOR THE SHORELINE MASTER PROGRAM UPDATE

PHASE	UPDATE SCHEDULE	TIMELINE
1	Meet with Planning Commission Determine what shorelines are regulated under the act Conduct an inventory of all existing and available data for shorelines	Fall 2009
2	Analyze and characterize shoreline conditions	Winter 2010
3	Characterize each shoreline segment into shoreline environment designations, each with a different set of rules Develop draft rules and policies	Spring 2010
4	Analyze the cumulative impacts of expected shoreline development and redevelopment Develop a restoration (and preservation) plan, including public access	Fall - Winter 2010
5	Conduct public hearing Planning Commission Recommendation Town Council Action	Spring - Fall 2011
6	Ecology Review Ecology Action Final Adoption by Ecology and Town Council	Winter- Spring 2012

C. Purpose and Scope of Plan

This document has been prepared to comply with the state's Shoreline Master Program guidelines for cumulative impact analyses (WAC 173-26-201(2). The guidelines are meant to ensure that SMP updates include shoreline policies and regulations that ensure that future development will cause no net loss of shoreline ecological functions in the shoreline environment. The concept of cumulative impacts and no net loss from the SMA is depicted within Figure 1.

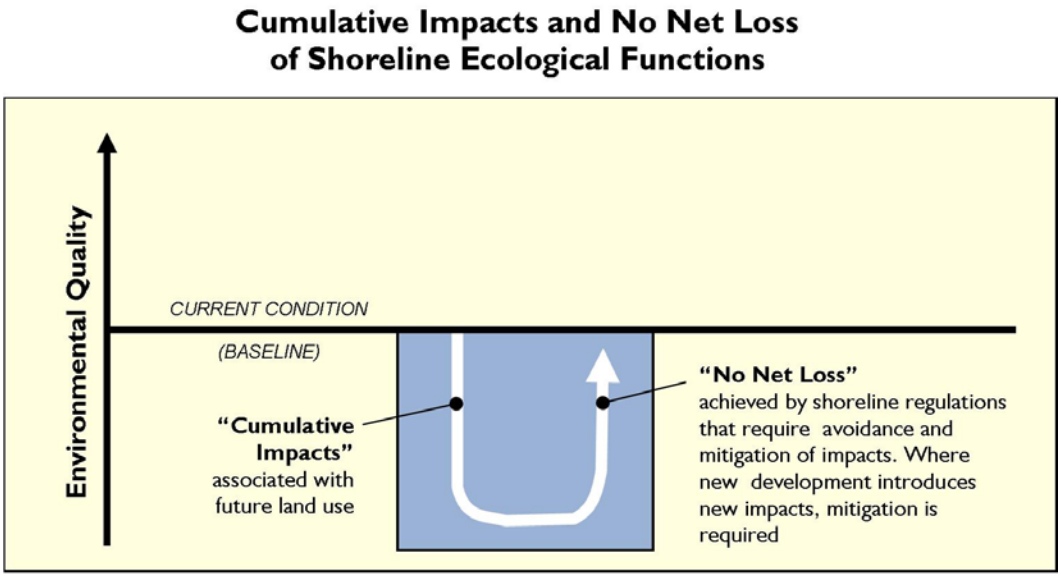

FIGURE 1: CONCEPTUAL VIEW OF CUMULATIVE IMPACTS AND NO NET LOSS (Source: WA Department of Ecology)

This Cumulative Impacts Analysis describes the anticipated shoreline development within the Town of Bucoda over time and assesses the total collective impacts of such development on future shoreline ecological functions. This analysis is a key step in forecasting the future and proactively dealing with potential impacts to shoreline functions. The SMP guidelines recommend that the analysis consider:

- Current circumstances affecting the shorelines and relevant natural processes;
- Reasonably foreseeable future development and use of the shoreline; and
- Beneficial effects of any established regulatory programs under other local, state, and federal laws.

Further, as part of this analysis, the Shoreline Management Act directs master programs to "include policies and regulations designed to achieve no net loss of those ecological functions" (WAC 173-26-186). This protection of shoreline

ecological functions, according to the guidelines that implement the act, is accomplished through the following:

- Meaningful understanding of current shoreline ecological conditions;
- Regulations and mitigation standards that ensure that permitted developments do not cause net loss of ecological functions;
- Regulations that ensure exempt developments do not result in net loss of ecological functions;
- Goals and policies for restoring ecologically impaired shorelines;
- Regulations and programs that fairly allocate the burden of mitigating cumulative impacts among development opportunities; and
- Incentives and voluntary measures designed to restore and protect ecological functions.

D. Methods and Sources of Information

To conduct this analysis to determine whether the *Proposed Shoreline Master Program – July 2011* has achieved this standard of no net loss of shoreline functions, this document has considered:

- Existing development within the shoreline environment;
- Allowed development under the Shoreline Master Program;
- Foreseeable development within the Town and the potential impacts of this development on the shoreline environment;
- The effect of the *Proposed Shoreline Master Program* and other regulations on these potential impacts; and
- Whether the regulations will ensure no net loss of shoreline ecological functions in the shoreline environment.

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II. Existing Land Use within the Bucoda Shoreline Environment

A detailed characterization of existing land use within the three Bucoda reaches of the Skookumchuck River is provided within the *Shoreline Inventory and Characterization Report* (2011) for the Town of Bucoda. This section summarizes this inventory in order to provide a baseline for the assessment of the cumulative impacts of the *Proposed Shoreline Master Program – July 2011*.

REACH 1: Reach 1 includes 28.4 acres of land on the west side of the Skookumchuck River. The reach primarily consists of a number of large parcels that are devoted to agricultural use or large lot single-family homes though some smaller lots associated with the older gridded portion of the Town are also present (the existing land use characteristics within the segment are summarized within table 2). A total of 15 homes sit on lots subject to the SMP in the area and, of these lots, all 15 are located within the 100-year floodplain. These homes have setbacks that range from 70 to 270 feet (50 to 200 feet) from the river.

TABLE 2: EXISTING LAND USES WITHIN REACH 1 IN THE TOWN OF BUCODA

Bucoda: Reach 1	Acreage	Total Number of Lots Subject to the SMP	Total Number of Buildings on Lots Subject to the SMP	Total Number of Buildings Located within the Shoreline Environment
Residential	19.88	20	15	10
Public ROW	3.98	N/A	-	-
Agricultural – Current Use (Zoned Residential)	4.54	5	0	0

Channel migration is active within the reach and the area contains a floodway that is generally wider than other reaches of the river. Thin strips of wetlands can be seen along the shore, however, riparian vegetation is generally minimal or absent with only a few areas along the reach having a strip of vegetation that is larger than one tree in width.

REACH 2: Reach 2 consists of single-family homes on lots associated with a newer subdivision and the gridded portion of the town, though the small Penitentiary Park site and some public right-of-way are also present. The area contains thirty lots in total, of which 26 are zoned for residential development and 23 are currently used for residential use. The area contains three vacant parcels, but only one of these parcels (a large triangular parcel in the recent subdivision, which is largely located outside of the shoreline environment) contains any development potential beyond a single residential unit. Two parcels are zoned for commercial use, but these parcels are located away from the water's edge and are not currently used for commercial purposes.

TABLE 3: EXISTING LAND USES WITHIN REACH 2 IN THE TOWN OF BUCODA

Bucoda: Reach 2	Acreage	Total Number of Lots Subject to SMP	Total Number of Buildings on Lots Subject to SMP	Total Number of Buildings Located within the Shoreline Environment
Residential	12.9	26	23	12
Commercial	0.3	2	1 – Residence (Other Lot has an Accessory Structure)	0
Public ROW	1.88	N/A	-	-
Park	0.6	2	0	0

Channel migration is limited within the reach and the area contains a floodway and floodplain that are generally narrower than other reaches in Bucoda. Thin strips of wetlands are present along the shore and riparian vegetation is relatively minimal, though more extensive than Reach 1, with only a few areas having a strip of vegetation larger than a few trees in width.

REACH 3: Reach 3 consists of twelve lots that are primarily devoted to single-family residential use. Of these lots, five have single-family homes on large lots, primarily located along the river, four are associated with Volunteer Park, two are devoted to forestry use, and one is a vacant lot. Of these parcels, five are large enough to see additional development in the future.

TABLE 4: EXISTING LAND USES WITHIN REACH 3 IN THE TOWN OF BUCODA

Bucoda: Reach 3	Acreage	Total Number of Lots Subject to SMP	Total Number of Buildings on Lots Subject to SMP	Total Number of Buildings Located within the Shoreline Environment
Residential	21.2	6	5	4
Natural Resources (Zoned Residential)	5.5	2	0	0
Public ROW	1.72	N/A	-	-
Park	5.8	4	0	0

Channel migration within the reach is less than is seen in Reach 1 and the area has a floodway and floodplain that are narrower than Reach 1, but wider than Reach 2 (four of the five residences within the area are located within the 100-year floodplain). Riparian vegetation and wetlands adjacent to the stream are also more prevalent in the area, especially when compared with other portions of the Town.

III. Allowed Land Use within the Shoreline Environment

Recognizing these existing conditions, the *Proposed Shoreline Master Program* has established a series of Shoreline Environment Designations for the Town of Bucoda. These shoreline designations were crafted to recognize the relatively urban development style associated with Reaches 1 and 2 on the west portion of the river and the relatively undisturbed and more natural character associated with Reach 3 of the east side of the Skookumchuck River. These shoreline designations are presented within Table 5.

TABLE 5: PROPOSED SHORELINE ENVIRONMENT DESIGNATIONS

Bucoda Shorelines	Shoreline Environment Designations
Reach 1	Shoreline Residential
Reach 2	Shoreline Residential
Reach 3	Urban Conservancy

In addition to these Shoreline Residential and Urban Conservancy designations, a third designation, Aquatic, applies to those portions of the river that are waterward of the ordinary high water mark.

These designations generally allow different land uses and are subject to different land use regulations including setbacks. A list of the uses and activities that are allowed within each shoreline designation is presented in Table 6 and a list of required development standards for these designations is provided in Table 7. Additional use standards applicable to each of these uses and activities can be found in Section 7 of the *Proposed Shoreline Master Program*.

TABLE 6: ALLOWED USES AND ACTIVITIES WITHIN THE SHORELINE DESIGNATIONS

USES & ACTIVITIES	Shoreline Residential	Urban Conservancy	Aquatic
Agriculture	P	P	NA
Aquaculture	X	X	X
Boating Facilities			
• Launch Ramps	X	X	X
• Marinas	X	X	X
Commercial	P[1]	P	X
Forest Practices	X	X	X
Industrial	X	X	X
Recreation	P	P	C
Residential			
• Single-Family	P	P	X
Solid Waste Disposal	X	X	X
Transportation			
• Roads and Railroads	P	P	C
• Shared Use Path	P	P	C
Utilities	P	P	C

P = Permitted Use; Use may require Substantial Development Permit or statement of exemption approval
C = Requires a Shoreline Conditional Use Permit
X = Prohibited; not eligible for a Substantial Development Permit or Shoreline Conditional Use Permit
NA = Not applicable, refer to the appropriate Master Program section for additional standards

1 = Within commercial zoning

TABLE 7: REGULATIONS WITHIN THE SHORELINE ENVIRONMENT DESIGNATIONS

REGULATIONS	Shoreline Residential	Urban Conservancy	Aquatic
Agriculture			
OHWM setback	*	*	NA
Building height	35’	35’	NA
Commercial			
OHWM setback	NA	NA	NA
Building Height	35’	35’	NA
Recreation Development			
OHWM setback	*	*	NA
Building Height	25’	25’	NA
Residential Development			
Single-Family Dwellings			
OHWM setback	*	*	NA
Maximum Density	3.5 du/ac	1 du/ac	NA
Building Height	35’	35’	NA
Maximum Impervious Surfaces	50%	30%	NA
Transportation			
Roads and Railroads			
OHWM setback	*	*	NA
Trails/Shared Use Paths			
OHWM setback	*	*	NA
Utilities			
OHWM setback	*	*	NA
Building height	35’	35’	NA

OHWM = Ordinary high water mark
NA = Not applicable, refer to the appropriate Master Program section for additional standards

* = Use must be located outside of critical area buffer. Refer to Section 6.2. Certain exceptions apply.

In addition to these requirements, shoreline modifications are also allowed within the shoreline environment. These standards are listed within Table 8 and are supplemented by the policies and regulations within Section 8 of the *Proposed Shoreline Master Program.*

TABLE 8: SHORELINE MODIFICATIONS BY SHORELINE ENVIRONMENT DESIGNATIONS

SHORELINE MODIFICATIONS	Shoreline Residential	Urban Conservancy	Aquatic
Dredging	NA	NA	X
Fill			
• Ecological Restoration Project	P	P	P
• All Other Activities	C	C	C
Recreational Float	NA	NA	P
Shoreline Stabilization			
• Restoration and Enhancement	P	P	P
• Bioengineering	P	P	C
• Revetment and Gabion	C	C	C
• Bulkhead	C	C	C
• Dike, Levee, and Instream Structure	C	C	C

P = Modification may require Substantial Development Permit or statement of exception approval.
C = Requires a Shoreline Conditional Use Permit
X = Prohibited; not eligible for a Substantial Development Permit or Shoreline Conditional Use Permit
NA = Not applicable, refer to the appropriate Master Program section for additional standards

IV. Foreseeable Development

Given the types of development that would be allowed by the *Proposed Shoreline Master Program*, as well as the existing character of the shoreline within the Bucoda, the following amount of development is anticipated within the Town. This amount of foreseeable development has been derived from the following sources:

- Infill potential as determined by the Buildable Lands Inventory conducted by Thurston Regional Planning Council (2007);
- Adopted ordinances and resolutions of the Town of Bucoda, including the zoning code and Critical Areas Ordinance; and
- The Town of Bucoda Comprehensive Plan and Capital Facilities Plan.

TABLE 9: FORESEEABLE DEVELOPMENT FOR SHORELINES – SKOOKUMCHUCK RIVER

River Reach	Proposed Designation	Foreseeable Development
Reach 1	Shoreline Residential	Single-family development on existing lots and potentially in some new subdivisions. Where these subdivisions occur, it is anticipated that they will include new roads and utilities. Additionally, public access points, utility crossings and some level of shoreline modification may be developed.
Reach 2	Shoreline Residential	A maximum of two single-family homes and one new commercial structure, each of which will be located at the edge of the shoreline environment. Public access points to the river may be developed, and some level of shoreline modification may also be requested.
Reach 3	Urban Conservancy	Development of single-family housing within new long or short plats. As part of these developments, a public access point to the river may be developed. It is more unlikely that there would be future shoreline modifications within this reach.

With this anticipated level of development, some impacts to the shoreline environment will occur. However, the *Proposed Shoreline Master Program* has been designed to mitigate these potential environmental impacts. An analysis of the potential impacts of future development, proposed measures to mitigate the potential impacts provided within the proposed SMP, and the cumulative impacts of several developments given these measures are provided within Tables 10 through 14.

TABLE 10: SINGLE-FAMILY DEVELOPMENT ON EXISTING LOTS

Foreseeable Development	Potential Impact	Mitigation	Cumulative Impact
Reach 1-A maximum of seven single-family homes could be constructed within the shoreline environment. Two of these homes could be sited outside the shoreline environment. Please note: this total number would decrease by one for every subdivision that occurred and would then be considered as part of Table 11. **Reach 2**-A maximum of two single-family homes is anticipated within this shoreline environment. Both of these homes would be located away from the waters and at the edge of the shoreline environment. **Reach 3**-A maximum of two homes could be developed on existing vacant lots. However, these lots both have further development potential beyond an individual home and would likely be developed as a short or long plat as specified within the next table.	Development of existing vacant parcels may remove some shoreline/ riparian vegetation, affect fish and wildlife habitat, add impervious surfaces near the river (which could contribute to peak stormwater runoff flows and less groundwater infiltration), and increase sediment and nutrient delivery to the river.	All residential development projects must consider mitigation sequencing and comply with the Bucoda critical areas regulations (see 7.9(B)(5)). Additionally, new development must not remove more than 15 percent of the existing riparian vegetation (see 6.2(B)(6)) or exceed 50 percent impervious surfaces on a site.	No net loss in ecological functions is anticipated.

TABLE 11: SINGLE-FAMILY HOUSING UNITS DEVELOPED ON LOTS CREATED THROUGH SUBDIVISION PROCESS

Foreseeable Development	Potential Impact	Mitigation	Cumulative Impact
Reach 1-According to the Buildable Lands Report of 2007, this reach has the potential for one significant subdivision, two smaller subdivisions (near five lots in size), and two short plats. However, it is likely that only one of these subdivisions and perhaps two short plats will occur in the foreseeable future. **Reach 2**- No subdivisions are anticipated within this reach. **Reach 3**-According to the Buildable Lands Report, this area has the potential for three long plats and one short plat. For the foreseeable future however it is anticipated that the Town will only see one of these long plats, and one short subdivision. Both of the long plats in the area have potential to locate majority of uses outside of the shoreline environment.	Subdivisions equal to or greater than five lots in size and short subdivisions less than five lots in size may seek to remove some shoreline/ riparian vegetation to accommodate the development. The development may also reduce groundwater infiltration and contribute to water quality impacts through the use of septic systems and the addition of impervious surfaces such as parking spaces and roadways in the shoreline environment.	Subdivisions within the shoreline environment can only be approved if: "a. A primary residence can be built on each new lot without: 1.) new structural shoreline stabilization; 2.) new improvements in the required shoreline buffer or required critical area buffer; 3.) causing significant vegetation removal that adversely impacts ecological functions; 4.) causing significant erosion or reduction in slope stability; and 5.) causing increased flood hazard or erosion in the new development or to other properties. b. Adequate sewer, water, access and utilities can be provided. c. The intensity and type of development is consistent with the Town Comprehensive Plan and development regulations. d. Potential significant adverse environmental impacts (including significant ecological impacts) can be avoided or mitigated to achieve no net loss of ecological functions, taking into consideration temporal loss due to development and potential adverse impacts to the environment" (see Regulation 7.9(B)(1)). Additionally all developments must meet the standards listed above for single-family homes on existing lots, the parking standards listed within 6.5(B), and the maximum impervious surface standards listed in Table 6.10 (shown above as Table 7).	No net loss in ecological functions is anticipated.

TABLE 12: TRANSPORTATION

Foreseeable Development	Potential Impact	Mitigation	Cumulative Impact
Reach 1-A new street (or streets) is anticipated as part of any new subdivision. **Reach 2**- No new roadways are anticipated. **Reach 3**- A new street (or streets) is anticipated as part of any new subdivision.	New roadways have the potential to increase impervious surfaces and stormwater runoff into the Skookumchuck, and could harm shoreline ecological functions such as habitat.	Transportation infrastructure within the shoreline environment is expected to be controlled by the standards within the critical areas ordinance (adopted by reference within the SMP), which regulate the allowed characteristics of development within the buffer of the Skookumchuck River and its associated wetlands (see section 6.2). Additional measures such as standards and policies that require mitigation sequencing in regard to the placement of roadways, and policies (and associated standards) that require that road design minimize the alteration to natural conditions including "the natural movement of ground water and flood waters" (see 7.11(A)(2)) will also limit the potential impact to shoreline environmental functions.	No net loss in ecological functions is anticipated.

TABLE 13: UTILITIES

Foreseeable Development	Potential Impact	Mitigation	Cumulative Impact
Reach 1-Some additional utilities may be placed within the shoreline environment, particularly as part of a subdivision development. **Reach 2**-Some additional utilities may be placed within the shoreline environment. **Reach 3**-Some additional utilities may be placed within the shoreline environment, particularly as part of a subdivision development.	Utilities have the potential to affect shoreline habitat, hydrology, and sediment generation and transport.	All utilities must be "designed and located to assure no net loss of shoreline ecological functions, preserve the natural landscape and minimize conflicts with present and planned land and shoreline uses" (see. 7.12(B)(1)). Additionally, utilities must be designed to insure that appropriate water quality measures are taken (see 7.12(B)(10)); appropriate safeguards are in place to ensure that no downstream impact will occur as a result of the failure of a facility (see 7.12(B)(10)); and utility lines are located outside of the shoreline area where feasible (see. 7.12(B)(2)).	No net loss in ecological functions is anticipated.

TABLE 14: PUBLIC ACCESS

Foreseeable Development	Potential Impact	Mitigation	Cumulative Impact
Reach 1- One or two new public access points may potentially be developed. **Reach 2** - One additional access point may be developed. **Reach 3** - One or more additional access points may be develped as part of a subdivision.	Public access to the river may adversely impact the environmental functions of the river through alteration of habitat, and some sediment delivery and transport, among other items.	Public access points and recreation facilities are meant to minimize the "impact on shoreline functions" (see 7.8(B)(2)), in part by being "buffered from sensitive ecological features and provid(ing) limited and controlled access to sensitive features and the water's edge where appropriate" (see 6.3(B)(9)(a)). Additionally, public access points are to be designed to "insure that appropriate water quality measures are taken, such as on-site stormwater control measures…(see 7.8(B)(10))."	No net loss in ecological functions is anticipated.

V. Potential Benefits of Other Regulations

In addition to the *Proposed Shoreline Master Program*, other state and federal regulations apply to Bucoda's shoreline jurisdiction. These state and federal regulations include, but are not limited to: the Endangered Species Act (ESA), which seeks to protect and recover federally listed endangered species; the Clean Water Act (CWA), which seeks to protect water quality and regulate the excavation and dredging of rivers; Hydraulic Project Approval (HPA), which regulates projects that change waters of the state and affect fish habitat; and the National Pollution Discharge and Elimination System (NPDES), which regulates discharges into surface waters.

Additionally, certain projects and policies may be subject to the State Environmental Protection Act (SEPA). SEPA requires an assessment of environmental impacts for projects or a jurisdiction's legislative actions that are subject to the act, and this review is intended to provide a list of possible environmental impacts that may occur as a result of a project or a change in policy. This SEPA process helps identify potential impacts that may need to be mitigated or conditioned as result of a proposal, and could result in the denial of a project.

Taken together, these additional federal and state regulations will further ensure that there is no net loss of shoreline ecological functions along the Skookumchuck River in the Town of Bucoda.

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VI. Summary

Considering the current conditions, the regulatory framework, and the foreseeable development in the shoreline environment of Bucoda, it is anticipated that there will be no net loss of ecological functions with the adoption of the *Proposed Shoreline Master Program – July 2001*. Foreseeable development within the Town will include some short and long plats, infill of single-family homes into existing areas, and the creation of amenities and facilities to support these homes, and the regulations within the Shoreline Master Program and other state and federal laws will ensure that these developments will be mitigated in a manner that ensures no net loss of ecological functions.

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VII. Resources

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