FINAL
September 2011

Cumulative Impact Analysis
Shoreline Master Program Update for Tenino

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 City of Tenino and its urban growth area. This plan 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 City and its urban growth area.

B. Timeline

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

TABLE 1: TIMELINE FOR THE SHORELINE MASTER PROGRAM UPDATE FOR THE CITY OF TENINO

PHASE	UPDATE SCHEDULE	TIMELINE
1	Meet with Planning Commissions 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 hearings Planning Commission Recommendation City Council Action	Spring - Fall 2011
6	Ecology Review Ecology Action Final Adoption by Ecology and City Council	Winter-Spring 2012

C. Purpose and Scope of Plan

This document has been prepared to comply with the state's Shoreline Master Program (SMP) 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.

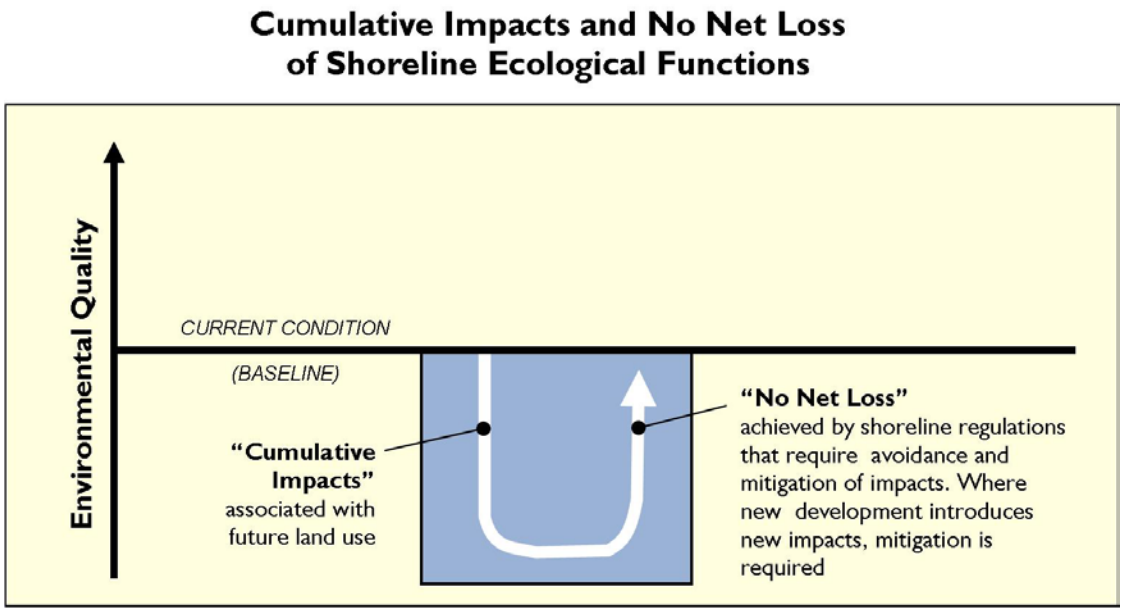

FIGURE 1: CONCEPTUAL VIEW OF CUMULATIVE IMPACTS AND NO NET LOSS

This cumulative impact analysis describes the anticipated shoreline development within the City of Tenino 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 determine whether the Tenino Shoreline Master Program 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 City 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.

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II. Existing Land Use within the Tenino Shoreline Environment

Existing land uses within the segments of Scatter Creek that are located in Tenino are detailed within the *Final Shoreline Inventory and Characterization - Shoreline Master Program Update for Tenino* (2011). This section largely duplicates the information from the inventory, but presents the information in a slightly modified version for this report.

SEGMENT A: Segment A is a 12.95 acre segment that lies along the most downstream portion of Scatter Creek, south of Old Highway 99. The segment is primarily located outside the City limits (with one small section inside the City), but is within the Tenino Urban Growth Area (UGA) boundary. Wetlands are prevalent within the segment and much of the land is located within the 100-year floodplain, but some areas are not subject to these environmental limitations.

The segment contains six parcels, four of which are vacant and two of which contain residences (for a summary of the existing land use in Segment A, please see Table 2). Future land use designations for the area are: Residential within the City limits, and undesignated within the unincorporated Urban Growth Area. Zoning for the area is Single-Family Residential within the City Limits, and Rural Residential Resource – 1 Unit per 5 Acres (county zoning) within the unincorporated Urban Growth Area.

TABLE 2: EXISTING SHORELINE DEVELOPMENT CHARACTERISTICS FOR SEGMENT A

Tenino: Segment A	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	12.95	6	4	3

SEGMENT B: Segment B is located north of Old Highway 99 from Segment A, and is entirely within the City limits. Wetlands are prevalent within the area, and the floodplain varies in size from 80 feet to approximately 700 feet in width (including both sides of the stream).

The area contains 11 parcels in total with four parcels containing residences and one parcel containing a historic sandstone quarry (for a summary of the existing land use in Segment B, please see Table 3). Right-of way created and dedicated to the public as part the Snyder and Steven's plat also appears to exist within the segments.

Ten homes are present on the four lots with residences (five of these homes are associated with a mobile home park on one lot and three of the homes are located on another parcel). Of these homes, two are potentially within the 100-year floodplain, and six are located within the shoreline environment. Lots in the area are designated as Residential on the Tenino Comprehensive Plan Future Land Use map and zoned as Single-Family Environmentally Sensitive. This zoning designation allows a maximum allowed density of four units per acre.

TABLE 3: EXISTING SHORELINE DEVELOPMENT CHARACTERISTICS FOR SEGMENT B

Tenino: Segment B	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	24.31	11	10 (on four lots)	6
Public Right-of-Way[1]	2.71	-	-	-

[1] Public right-of-way includes streets that may or may not have been vacated in the past.

SEGMENT C: Segment C is a short segment that is located between the Burlington Northern Santa Fe (BNSF) mainline and the Tenino High School. The area is entirely within the City limits and is dominated by a large wetland that is located directly east of the Burlington Northern Santa Fe Rail line and filled with reed canary grass.

Eight parcels exist within the area (for a summary of the land use characteristics in Segment C, please see Table 4). Three of these parcels are owned by the BNSF Railroad and are zoned as Public – Semi Public; two are only partially located within the shoreline environment (located at the corner of the Tenino High School grounds) and are zoned as Public – Semi Public; two are zoned-Single-Family and one is zoned as Single-Family Environmentally Sensitive. Portions of the Wichman right-of-way and an additional historic right-of-way to the west of the Wichman right-of-way are also located within the area.

TABLE 4: EXISTING SHORELINE DEVELOPMENT CHARACTERISTICS FOR SEGMENT C

Tenino: Segment C	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	11.05	8	2	0
Public Right-of-Way[1]	2.15	-	-	-

[1] Public right-of-way includes streets that may or may not have been vacated in the past.

SEGMENT D: Segment D includes 15.0 acres of shoreline area that extends both west and east of the Old Highway 99 Bridge on the north end of Tenino. The western portions of this area consist of one large vacant property that contains an oak and ash upland riparian habitat and a wetland/ stream channel that is filled with reed canary grass, and the eastern portion of the segment contains two residential properties.

The Comprehensive Plan Future Land Use designation for the area is Residential and the zoning for the area is Single-Family Environmentally Sensitive. The Old Highway 99 Bridge over the creek and right-of-way associated with the road are also located within the area (for a summary of the land use characteristics in Segment D, please see Table 5).

TABLE 5: EXISTING SHORELINE DEVELOPMENT CHARACTERISTICS FOR SEGMENT D

Tenino: Segment D	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	14.62	3	2	2
Public Right-of-Way	.38	-	-	-

SEGMENT E: Segment E is a small area on the east end of the City that is not located on Scatter Creek, but is located within 200 feet of the creek and/or its associated wetland. The area contains .64 acres of land, which are zoned Single-Family Environmentally Sensitive, and includes portions of five parcels. Of these parcels, only one currently contains a building, and this building is located outside of the shoreline environment (please see Table 6 for a summary of the land use characteristics in Segment D).

TABLE 6: EXISTING SHORELINE DEVELOPMENT CHARACTERISTICS FOR SEGMENT E

Tenino: Segment E	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	.65	5	1	0

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III. Allowed Land Use within the Tenino Shoreline Environment

Recognizing these existing conditions, the Shoreline Master Program has established two Shoreline Designations for the City of Tenino: Urban Conservancy and Aquatic. The Urban Conservancy designation has been crafted to recognize the relatively undeveloped nature of the existing shorelines within Tenino, and the aquatic designation applies to those portions of Scatter Creek that are waterward the ordinary high water mark.

These designations generally allow different land uses and are subject to different land use regulations. A list of the uses and activities that are allowed within the shoreline designations is presented in Table 7 and a list of required development standards for the designations is provided in Table 8. Additional use standards applicable to each of these uses and activities can be found in Section 7 of the Shoreline Master Program.

TABLE 7: ALLOWED USES AND ACTIVITIES WITHIN THE SHORELINE ENVIRONMENT DESIGNATIONS

USES & ACTIVITIES	Urban Conservancy	Aquatic
Agriculture	P	NA
Aquaculture	X	X
Boating Facilities	X	X
Commercial	X	X
Forest Practices	X	X
Industrial	X	X
Mining	C	X
Recreation	C[1] / P[2]	C
Residential • Single-Family	 P	 X
Solid Waste Disposal	X	X
Transportation • Roads and Railroads • Shared Use Path	 C[1] / P[2] P	 C C
Utilities	C[1] / P[2]	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 one hundred (150) feet from the ordinary high water mark
2 = Beyond one hundred (150) feet from the ordinary high water mark

TABLE 8: REGULATIONS WITHIN THE SHORELINE ENVIRONMENT DESIGNATIONS

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

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

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

In addition to these requirements, shoreline modifications are also allowed within the shoreline environment. Standards for these modifications are listed within Table 9 and supplemented by the policies and regulations within Section 8 of the Shoreline Master Program.

TABLE 9: SHORELINE MODIFICATIONS BY SHORELINE ENVIRONMENT DESIGNATION

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

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

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IV. Foreseeable Development

Given these types of development that are allowed within the Shoreline Master Program, as well as the existing character of the shoreline within the Tenino, the following amount of development is anticipated. This amount 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);
- The City of Tenino Municipal Code and Critical Areas Ordinance; and
- The City of Tenino Comprehensive Plan and Capital Facilities Plan.

TABLE 10: FORESEEABLE DEVELOPMENT FOR THE SHORELINE ENVIRONMENT – SCATTER CREEK

Stream Segment	Proposed Designation	Foreseeable Development
Segment A	Urban Conservancy	Single-family development primarily on existing lots. Additionally, public access points to the river, utility crossings and some level of shoreline modification may occur.
Segment B	Urban Conservancy	Single-family development primarily on existing lots, though one or two short or long plats may occur. Public access points to the river, utility crossings and some level of shoreline modification may also be developed.
Segment C	Urban Conservancy	Some single-family development on existing lots may occur as part of a reasonable use permit. Additionally, public access points to the river, expansion of the rail right-of-way and culvert or some other shoreline modification may be developed.
Segment D	Urban Conservancy	Single-family development as part of a long or short plat. A maximum of two long plats (or subdivisions over five lots in size) and one short plat (or subdivision less than five lots in size) may be expected. Additionally, public access points to the river, utility crossings and some shoreline modification may occur.
Segment E	Urban Conservancy	Single-family development associated with a short plat.

With this anticipated level of development, some impacts will occur to the shoreline environment. However, the Shoreline Master Program has been designed to mitigate any potential environmental impacts that may occur. Tables 11 through 15 contain an analysis of the potential impacts that a development may have, proposed measures to mitigate the potential impact provided within the Shoreline Master Program, and the cumulative impacts of several developments given the proposed SMP is adopted.

TABLE 11: SINGLE-FAMILY HOUSING DEVELOPMENT ON EXISTING LOTS

Foreseeable Development	Potential Impact	Mitigation	Cumulative Impact
Segment A – Two additional homes could be developed within the area. Please note: this number would decrease by one for every subdivision that occurred in the area and would then be considered as part of the Table 12. **Segment B –** Three homes could be developed on existing vacant lots within the area. Additional short and long plats could also potentially be developed (see Table 12). **Segment C –** One additional home could potentially be developed under reasonable use provisions. **Segment D –** One home could be developed on an existing lot. However, this lot is anticipated to be long platted in the future and is considered in Table 12. **Segment E –** Four homes could be developed on existing lots.	Development of existing vacant parcels may remove some shoreline/ riparian vegetation, affect fish and wildlife habitat, add impervious surfaces near the creek (which could contribute to peak stormwater runoff flows and less groundwater infiltration), and increase sediment and nutrient delivery into the creek.	All residential development must comply with the Tenino critical areas regulations, as adopted within the Shoreline Master Program (see Regulation 6.2(B)(2)). Development must also not remove more than 15 percent of the existing riparian vegetation (see 6.2(B)(7)) or exceed 30 percent impervious surfaces.	No net loss in ecological functions is antcipated.

TABLE 12: SINGLE-FAMILY UNITS ON LOTS CREATED THROUGH A SUBDIVISION PROCESS

Foreseeable Development	Potential Impact	Mitigation	Cumulative Impact
Segment A – A couple of small (two to three lot) short plats could potentially occur. **Segment B –** According to the Buildable Lands Report of 2007, this reach has the potential for a long plat (or subdivision over five lots in size) and a short plat. **Segment C –** No additional land divisions are expected within this shoreline segment. **Segment D –** Two long plats and a short plat are possible within this shoreline segment. **Segment E** – According to the Buildable Lands Report, no subdivision activity is anticipated within the area. Depending on the location of wetlands within the area, a couple of small (two to three lot) short plats could potentially occur.	Short and long plats may remove some shoreline/ riparian vegetation to accommodate the development. Subdivisions may additionally reduce groundwater infiltration and contribute to water quality impacts through the addition of impervious surfaces such as parking spaces and roadways to the shoreline area.	Subdivisions within the shoreline environment can only be approved if: "a. A primary residence can be built on each new lot without any of the following being necessary: i. New structural shoreline stabilization; ii. New improvements in the required shoreline buffer or required critical area buffer; iii. Causing significant vegetation removal that adversely impacts ecological functions; iv. Causing significant erosion or reduction in slope stability; and v. 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 City 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 7.10(B)(1)) Additionally all developments must meet the standards listed above for single-family homes on existing lots, the water quality standards listed within Section 6.4 of the SMP, and the 30 percent maximum impervious surface standard listed in Table 6.10 (shown above as Table 8).	No net loss in ecological functions is anticipated.

TABLE 13: TRANSPORTATION

Foreseeable Development	Potential Impact	Mitigation	Cumulative Impact
Segment A - Access to new single-family residences are expected, and the creation of a new roadway on the west portion of the segment may occur as part of a subdivision process. **Segment B** - A new street (or streets) is anticipated as part of any new subdivision. Additionally improvements to the Old Highway 99 Bridge on the west side of town and the Morningside Bridge may occur. **Segment C** - Access to new single-family residences are expected. **Segment D** - A new street (or streets) is anticipated as part of any new subdivision. No major changes to the Old Highway 99 Bridge north of the City are anticipated. **Segment E** - No additional streets beyond a potential access to a short plat are expected.	New roadways have the potential to increase impervious surfaces and stormwater runoff into Scatter Creek, and could affect shoreline ecological functions such as habitat, depending on the placement of the facilty. Bridges also have the potential to impact Scatter Creek through the removal of shoreline vegetation and a temporary increase of sedimentation associated with construction or maintenaince, among other factors.	Transportation infrastructure within the shoreline environment is expected to be controlled by the standards within the critical areas ordinance (portions of which are adopted by reference within the SMP). These critical area regulations provide clear standards for development of facilities such as new roads within the buffer of the Scatter Creek and its associated wetlands. Additional measures that limit the potential impact to shoreline environmental functions include standards and policies that require mitigation sequencing in regard to the placement of roadways and other transportation infrastructure, and policies that require that road design minimize alteration to natural conditions, including "the natural movement of ground water and flood waters" (see 7.11(A)(2)).	No net loss in ecological functions is anticipated.

TABLE 14: UTILITIES

UTILITIES			
Foreseeable Development	**Potential Impact**	**Mitigation**	**Cumulative Impact**
Segment A – Some additional utilties may be placed within the shoreline environment, particularly as part of a subdivision development. **Segment B –** Some additional utilties may be placed within the shoreline environment, particularly as subdivisions occur on the west portion of the City. **Segment C –** Some utlities may be placed within the segment if single-family housing development occurs in the area. **Segment D** - Some additional utilties may be placed within the shoreline environment as part of a subdivision development. **Segment E** - Some utlities may be placed within the segment if additional single-family housing or subdivision development occurs.	Utilities have the potential to affect habitat quality and sediment generation.	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 rgulation 7.13(B)(1)). Additionally, utilities must be designed to insure that appropriate water quality measures are taken (see 7.13(B)(10)); utility facilities have appropriate safeguards in place to ensure that no downstream impact will occur as a result of the failure of the facility (see 7.13(B)(10)); and utility lines are located outside of the shoreline area where feasible (see 7.13(B)(2)).	No net loss in ecological functions is anticipated.

TABLE 15: PUBLIC ACCESS

PUBLIC ACCESS			
Foreseeable Development	**Potential Impact**	**Mitigation**	**Cumulative Impact**
Segment A – One public access point could potentially be developed **Segment B –** One or two public access points are possible **Segment C –** One access point may be developed **Segment D –** One or two public access points could potentially occur in the area. **Segment E –** No public access points are anticipated.	Public access to Scatter Creek may adversely impact the environmental functions of the creek through the destruction of habitat and the delivery and transport of sediment, among other items.	Public access points and recreation facilities are to be designed to minimize the "impact on shoreline functions" (see 7.9(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)). Public access points are also required to meet the water quality measures described within Section 6.4.	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 Tenino'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, the State Environmental Protection Act (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 ultimately 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 Scatter Creek within the City of Tenino.

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VI. Summary

Considering current conditions, the regulatory framework, and the foreseeable development along shorelines, it is anticipated that there will be no net loss of ecological functions under the *Proposed Shoreline Master Program for the City of Tenino* (2011). Foreseeable development within the Tenino shoreline environment 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. The regulations within the Shoreline Master Program will ensure that these future potential developments will be mitigated in a manner commensurate with the impacts expected from this development.

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VII. Resources

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