Draft

DRAFT CUMULATIVE IMPACTS ASSESSMENT

Town Of Eatonville Shoreline Master Program Update

Prepared for
Town of Eatonville

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ESA

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1.0 INTRODUCTION

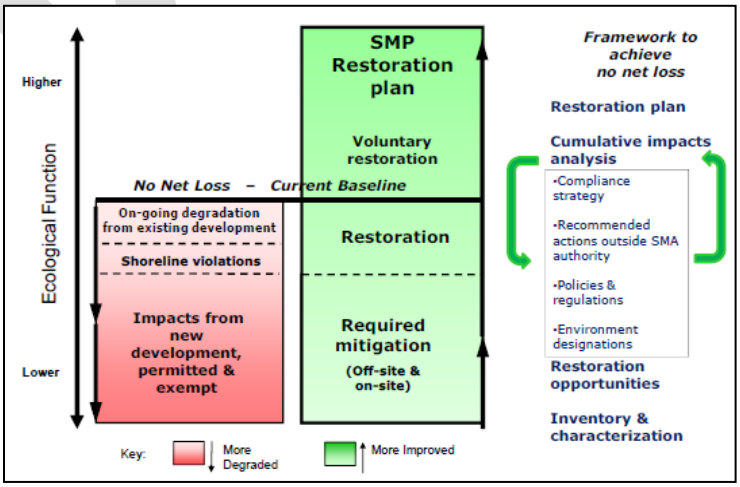
The Town of Eatonville is updating its Shoreline Master Program (SMP) consistent with state guidelines (WAC Chapter 173-26). Under the shoreline guidelines, local jurisdictions are required to evaluate and consider cumulative impacts of reasonably foreseeable future development in the shorelines of the state (WAC 173-26-186(8)(d)). This report assesses the cumulative impacts of development in the shoreline that would result from development and activities over time under the provisions contained in the proposed Draft SMP, dated Month, 2011.

The Town of Eatonville and all of its shorelines are located within the Nisqually River Watershed, referred to as Water Resource Inventory Area (WRIA) 11. There are approximately 3 linear miles of shoreline within the town limits and 2.6 linear miles within the urban growth area (UGA). The provisions of the Draft SMP would apply to all shorelines of the state and shorelands as defined in RCW 90.58.030. Shorelines of the state within the Town of Eatonville and its UGA include the Mashel River, the Little Mashel River, Ohop Creek, and Lynch Creek.

The purpose of evaluating cumulative impacts is to ensure that, when implemented over time, the proposed SMP goals, policies and regulations will achieve no net loss of shoreline ecological functions from current "baseline" conditions. Baseline conditions were established and are described in the Town of Eatonville Shoreline Inventory and Characterization Report (ESA Adolfson, 2010).

The proposed Draft SMP provides standards and procedures to evaluate individual uses or developments for their potential to impact shoreline resources on a case-by-case basis through the permitting process. The Draft SMP also includes mitigation requirement to be applied to shoreline developments and activities commensurate with identified impacts. The purpose of this report is to determine if impacts to shoreline ecological functions are likely to result from the aggregate of activities and developments in the shoreline that take place over time as well as ongoing impacts from previous shoreline development activity that would result in a net loss of ecological functions. The following graphic provides a visual description of the role of the SMP update in achieving no net loss.

Figure 1. Achieving No Net Loss of Ecological Functions



Source: Washington State Department of Ecology

The guidelines 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 among development opportunities. Evaluation of such cumulative impacts should consider:

1. Current circumstances affecting the shorelines and relevant natural processes;

2. Reasonably foreseeable future development and use of the shoreline; and

3. Beneficial effects of any established regulatory programs under other local, state, and federal laws."

This cumulative impacts assessment uses these three considerations as a framework for evaluating the potential long-term impacts on shoreline ecological functions and processes that may result from development or activities under the Draft SMP over time. This assessment considers current circumstances; reasonably foreseeable future development and use; potential effects of development under the proposed SMP provisions; restoration planning and other federal, state, and local programs. Based on this information, an assessment is made as to whether the conditions of ecological functions in the shoreline are likely to remain at current levels, improve, or be degraded. If conditions are likely to remain or improve, "no net loss" is likely to be achieved.

2.0 EXISTING CONDITIONS

The Town of Eatonville and all of its shorelines are located within the Nisqually River Watershed, referred to as Water Resource Inventory Area (WRIA) 11 by the state. The watershed encompasses approximately 491,300 acres within Pierce, Thurston and Lewis Counties. The basin's headwaters originate at Mount Rainier's Nisqually Glacier (although none of the streams that flow through the Town are glacier-fed), and eventually empty into Puget Sound at the Nisqually National Wildlife Refuge. Medium-gradient rivers in the upper watershed give way to very low-gradient systems in the lowlands. Elevations range from over 14,000 feet above sea level at the summit of Mount Rainier to sea level at the Nisqually River's mouth. Population is relatively sparse in WRIA 11, with the highest densities occurring around the Towns of Eatonville and Roy. The predominant land uses within WRIA 11 are forest resource and timber harvest.

As part of the Town's SMP update process, a Shoreline Inventory and Characterization Report (ESA Adolfson, 2010) was prepared. The report identified existing conditions and evaluated ecological functions and processes of all shoreline areas within the Town's shoreline planning area. Key ecological functions at risk from future development were evaluated. The results of those evaluations are shown below for each waterbody. Key processes and functions and their current level of alterations were also identified. Those are summarized below in Table 1. Additional detail can be found in the Inventory and Characterization Report (ESA Adolfson, 2010) and the Draft Shoreline Restoration Plan (ESA, 2011).

2.1 Ohop Creek

Ohop Creek flows from its headwaters south of Lake Kapowsin south and west to its confluence with the Nisqually River. In 1889, the upper portion of Ohop Creek (15 mi^2 of the upper watershed) was diverted north into the Puyallup Basin, which reportedly reduced the flow in Ohop Creek by about 30 percent (WPN, 2002). Slightly more than a mile of the creek flows through the Town of Eatonville and its UGA. Within the Town of Eatonville, Ohop Creek flows from Ohop Lake immediately north of the Town to the eastern Town UGA

boundary through the Ohop Valley. Four unnamed tributary creeks enter the mainstem of the creek within this area.

The general land use pattern in the Town's Ohop Creek shoreline planning area is a mix of rural density residential development, agricultural areas, small-scale commercial uses and open space. Commercial uses are concentrated around SR 161. Structures include mostly one story commercial buildings, homes and agricultural structures.

During the 19th and early 20th centuries farmers turned the portions of the creek into a straight-flowing ditch in an attempt to drain the Ohop Valley and create better pasture for their dairy cattle. Channelization occurred from the mouth of the creek to approximately RM 4.2, which is downstream of the Town's shoreline planning area. While channelization occurred below the Town, the impacts to salmonid populations were felt throughout the system. The Ohop Creek Restoration Project (ongoing) is currently restoring riparian vegetation and in-channel large wood to a significant portion of the Ohop Creek planning area. While not in the Town, the likely outcome of the project will be an improvement to the system-wide functions and more fish in the Town's portion of Ohop Creek.

Historically, riparian vegetation in the Ohop Creek planning area was a densely vegetated mix of palustrine forest, scrub shrub, and emergent wetland. Shoreline vegetation is a key factor in properly functioning shorelines. Agricultural and residential development has altered shoreline vegetation. Shoreline vegetation is currently characterized as sparse in areas with stands that are not of an adequate size and density to provide functional wood development. There are also areas with significant encroachment by invasive species.

The Town of Eatonville's stormwater discharge to Lynch Creek has been identified as a source of turbidity in Ohop Creek.

2.2 Lynch Creek

Lynch Creek is one of two primary tributaries of Ohop Creek. The headwaters of the stream originate on a ridge at approximately 3,000 feet in elevation. Lynch Creek has one named tributary stream: Burg Creek, which joins Lynch Creek east of the Town's UGA boundary. Lynch Creek flows into Ohop Creek within the Town's boundary. Approximately 1.9 discontinuous miles of Lynch Creek weave in and out through the Town and the Town's UGA. Roughly 0.68 miles of the creek are actually within the Town.

Land use along the western portion of the Town's Lynch Creek shoreline planning area is a mix of rural density residential development, agricultural areas and undeveloped areas. Land use in the eastern portion of the planning area (east of Lynch Creek Rd E) includes undeveloped lands, Eatonville airport, and the Lynch Creek Quarry.

According to the Nisqually Tribe's Ecosystem Diagnosis and Treatment (EDT) model results, the major problems affecting salmon survival include the high sediment load, reduced channel stability and habitat diversity (due to reduction in the amount of instream wood and simplification of the channel and its disconnection from the floodplain in some areas). The EDT analysis ranked Lynch Creek as a high priority for both restoration and preservation.

The lack of riparian vegetation along portions of Lynch Creek has reduced shading along the stream, potentially resulting in increased stream temperatures and lowered dissolved oxygen. Lack of larger trees along the stream means less wood in the stream channel. Removal of native riparian vegetation has also increased the opportunity for non-native invasive plants such as reed canarygrass to become established.

Lastly, most of the Town's stormwater runoff is conveyed to an outfall in Lynch Creek. Stormwater runoff has increased turbidity and other pollutants in the stream. The addition of stormwater also increases the "flashiness" of the creek, with higher peak flows that occur sooner after the rain event.

2.3 Little Mashel River

The Little Mashel River flows from its headwaters north of the Nisqually River to its confluence with the Mashel River southwest of the Town of Eatonville. The Little Mashel is wholly within the Town's UGA, it flows for approximately a quarter mile within the UGA prior to its confluence with the Mashel River. The general land use pattern in the shoreline planning area is low density single-family residential development.

There are some indications that the creek was channelized as some point in the past, although no other shoreline modifications are present. A railroad bridge used to cross the Little Mashel River. While the railroad is no longer operating, the bridge abutments are still present along the shoreline. The embankments in this area are relatively high and the bridge abutments have increased channel confinement.

Riparian vegetation is lacking within the shoreline. The lack of riparian vegetation generally reduces shading along the stream, potentially resulting in increased stream temperatures and lowered dissolved oxygen. A lack of larger trees along the stream means less wood in the stream channel. Channelization and in the lower reaches has removed some of the river's natural meander. As a result, hydrology has been altered resulting in channel scour, increased sedimentation, and ultimately decreased fish habitat quality.

2.4 Mashel River

The Mashel River originates on the mountain slopes associated with Mount Rainier. It is a tributary to the Nisqually River which it joins at RM 39.6. Flow of the river through Eatonville is unregulated except for a diversion for the municipal drinking water system. There are three bridges that influence hydraulic conditions in the river. The Mashel River has the highest overall flows of any of the Nisqually tributaries below the LaGrande Dam. However, it also has very low flows in the summer that are lower than historic summer flows.

Due to a combination of floods and timber harvest activities in the upper watershed, large amounts of sediment from landslides were moved into the channel of the Mashel River about 20 to 30 years ago. Much of that sediment still controls the form of the channel seen today. The channel has mostly shallow pools, unconsolidated substrate, and is generally fairly wide. The river is now slowly reworking those deposits, leading to narrowing of the channel and consolidation of gravel (Pierce County, 2008).

The general land use pattern in the Town's Mashel River shoreline planning area is a mix of rural density residential development, minor agricultural areas, limited small-scale commercial uses and open space. A significant portion of the Mashel River shorelines in the Town's shoreline planning area are publically owned or privately owned by the Nisqually Land Trust and dedicated for restoration and preservation. The Town also owns and operates water and wastewater facilities located within the planning area.

The lack of riparian vegetation along portions of the river reduces shading along the stream, potentially resulting in increased stream temperatures and lowered dissolved oxygen. A lack of larger trees along the stream means less wood in the stream channel.

Table 1. Level of Alteration for Shorelines of the State in the Town of Eatonville

Ecosystem Process / Shoreline Function	Level of Alteration			
	Ohop Creek	**Lynch Creek**	**Mashel River**	**Little Mashel River**
Hydrology	Moderate. Contributing area has been directly modified, as a significant portion (15 mi^2) of the upper watershed was diverted to flow to Kapowsin Lake and the Puyallup River to prevent flooding.	Moderate. Runoff generated in the Town of Eatonville flows to Lynch Creek with minimal flow control measures. Much of Lynch Creek is low elevation, and therefore rain dominated, but the watershed does extend to the rain-on-snow dominated elevations. A section of the creek is moderately developed (in the UGA) and the channel is confined, flooding has occurred, and there are no stormwater facilities.	Moderate to High. Past channel modifications resulted in a simplified, narrow channel between the Little Mashel River confluence and Boxcar Canyon (ESA Adolfson, 2008).	Minimal for overall watershed hydrology. Natural snowmelt and rain-on-snow hydrology currently function. Moderate for channel form. Some channelization may have occurred downstream of SR 161, and channel migration may be artificially limited to protect existing structures and other infrastructure.
Hyporheic Functions	Moderate. Land use conversion in the floodplain has likely disconnected and/or modified connections between the channel and wetlands in the floodplain. However, low-density residential development and agricultural land uses still allow for infiltration to the underlying aquifer.	Moderate to low. Residential development and road crossings have modified channel plan form and limited migration, especially in the lower portion near the confluence with Ohop Creek.	Moderate to High. Channel alterations have altered the overall channel alignment, removed riparian vegetation, and decreased channel-floodplain connections. Secondary treated wastewater is discharged to the river in this reach.	Moderate to Low. Shallow bedrock in much of drainage limits hyporheic exchange. Channel modification at bridge crossings and downstream of SR 161 may have altered hyporheic flow patterns.
Shoreline Vegetation	Moderate to low. Although patchy in places, a narrow, forested, riparian zone exists for the majority of the length of Ohop Creek through the Town's SPA. Reed canarygrass and Himalayan blackberry are established in some areas.	Moderate. Riparian forest exists along the majority of Lynch Creek, gaps occur and width is very narrow in places.	Moderate. Discontinuous and developing riparian vegetation exists through much of the reach.	Minimal. Riparian forest exists (albeit narrow in places) throughout the portion that flows through the SPA, with the exception of the two bridge crossings.

Ecosystem Process / Shoreline Function	Level of Alteration			
	Ohop Creek	**Lynch Creek**	**Mashel River**	**Little Mashel River**
Habitat	Moderate to low. Lowered LWD loading and increased fine sediment loading has degraded habitat in this reach. High phosphorus levels have been documented in Ohop Lake, upstream from the Town's Ohop shoreline (WPN, 2002). The elevated phosphorus may be attributable to failing residential septic systems or use of lawn fertilizers.	Moderate. Reduced habitat diversity due to reduction in LWD, simplification of channel, disconnection of channel and floodplain, and loss of pool habitat (ESA Adolfson, 2008).	Moderate to High. Direct and indirect alterations to the channel have resulted in-bed scour and high levels of fine sediment have reduced habitat quality throughout the Town's SPA.	Low. Instream habitat is reported to be good, but fish use limited due to natural migration barrier at RM 0.8 (WPN et al., 2001).

3.0 REASONABLY FORESEEABLE FUTURE DEVELOPMENT

The following section provides an assessment of reasonably foreseeable future development in the Town's shorelines. This section considers new development, redevelopment and subdivision. The planning horizon for the Draft Eatonville SMP is 20 years. Future development is generally estimated for this time period. This general analysis of reasonable foreseeable future development was conducted using several sources of information. An assessment of vacant, redevelopable or underutilized lands was conducted using 2009 Pierce County assesor's data. To identify parcels that have the potential to redevelop or subdivide, methods similar to those used in the Pierce County Buildable Lands Report (2007) were used.

Vacancy was assumed to be an indicator of potential development. It was assumed that parcels had the potential to subdivide into residential lots if the lot size of the parcel was at least two times the minimum lot size for the underlying zoning. Parcels that were "under-developed" or likely to redevelop were identified using the following assumption:

Improvement Value / Land Value < 0.50 = Parcels that are under-developed

For example, if a property has been assessed by Pierce County as having an improvement value of $10,000 and a land value of $100,000 then the improvement to land value ratio would be equal to 0.10. Since 0.10 is less than 0.50 the property is under-developed per our assumption.

The results of these analyses are shown in Figures 2 through 4. It is also assumed that properties with existing single-family residences that are located within commercial zoning are under-developed. Other sources of information included Town planning documents, such as the Town's Comprehensive Plan (Town of Eatonville, 2005), the Swanson Field Airport Layout Plan (HDR, 2009) and the Lynch Creek Quarry Sub-area Plan (Town of Eatonville, 2009), as well as input from Town staff.

Single family residential use and water-oriented commercial uses are preferred uses according to the Shoreline Management Act (SMA). However, development or subdivision of properties, the potential to alter shoreline vegetation or limit the growth of riparian areas, increase impervious surface, or modify stream banks are are a major focus for SMP updates. The Draft SMP attempts to minimize the potential adverse effects that potential development may have on shoreline functions.

In general the Town's shorelines are largely zoned and planned for low-density residential use with some limited commercial uses allowed as well. Along Ohop, Lynch, the Little Mashel, and portions of the Mashel River, much of the private residentially zoned property has been developed, although at lower than allowed densities. In these areas, future development will consist of redevelopment or subdivision. There are vacant parcels along all of the shorelines which may be subdivided and/or developed within the shorelines. Specific development potential is discussed for each of the Town's shoreline planning areas below.

It is also important to note that the Town's critical areas standards (adopted into the SMP) require the maintenance of a 200-foot buffer along all shorelines of the state. Therefore, while specific uses, subdivisions and development may be allowed by the underlying zoning, most of the Town's shoreline jurisdiction will not be developed without a shoreline variance.

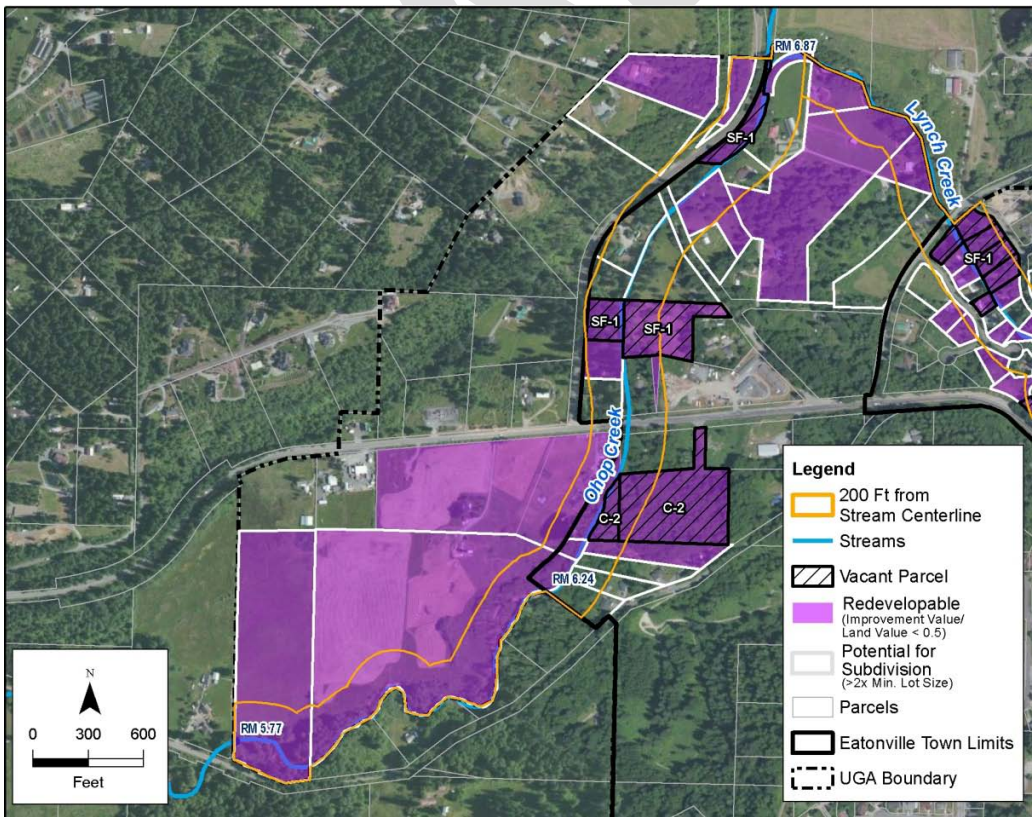
3.1 Ohop Creek

A review of Pierce County assessor's data and Town zoning indicates that there is the potential for new development, redevelopment and increased land use intensity along the creek. There are approximately five vacant parcels adjacent to the creek, which could be developed. Three of these are zoned for single-family residential (SF-1) and two are zoned for commercial use (C-2). Several of the parcels adjacent to the creek are at least twice the minimum lot size (9,600), meaning that the potential for subdivision exists.

There are four parcels zoned Commercial (C-2) adjacent to the creek. Two are developed for single-family use, and two are identified as vacant. Because a variety of commercial uses are allowed on these parcels, the potential for development and greater land use intensity exists.

None of the Ohop shoreline is currently sewered. Development and/or redevelopment would only be possible if the Town's sewer is extended to this area. A sewer extension, referred to as the Ohop Valley Force Main, Pump Station and Collectors, is included in the capital facilities plan within the Town's Comprehensive plan. The project is identified as including a 5,800 foot three inch force main within the SR-161 right-of-way and three lift stations. The estimated cost of this project was $1,100,000 in 2004 (Town of Eatonville, 2004). Until sewered, future development in this area would not be considered reasonably foreseeable. Figure 2 shows the vacant parcels that are wholly or partially within 200 feet of the creek's centerline[1], their zoning and whether the parcel is large enough to be subdivided into two or more lots.

Figure 2. Potentially Developable Parcels along Ohop Creek



[1] The centerline was used because digital data of an approximation of the OHWM is not available.

3.2 Lynch Creek

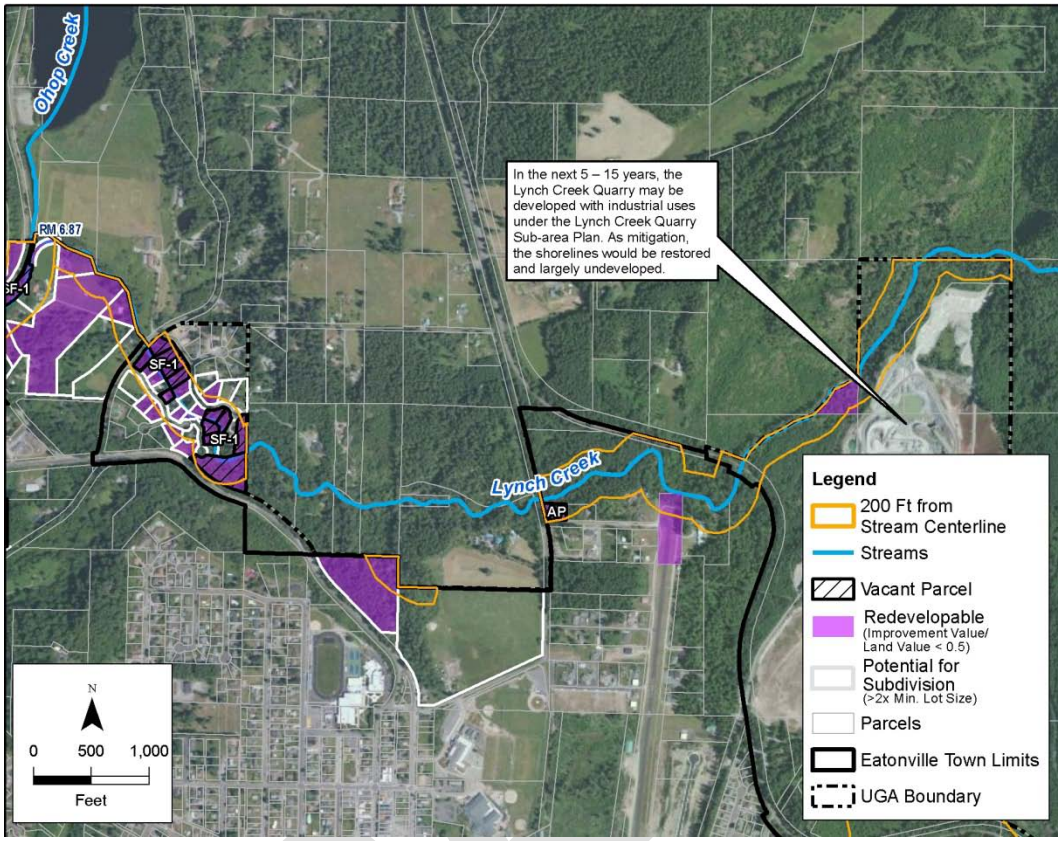
Pierce County Assessor's data and Town zoning indicates that there is the potential for increased residential development in the western portion of the planning area as well as the likelihood of increased development in the longer-term through the Lynch Creek Quarry subarea plan (2009). There are approximately 12 vacant parcels adjacent to Lynch Creek. Of these, 11 are located in the western portion of the planning area within the Town's UGA and are zoned for single-family development. Some of these vacant parcels are subdivided lots that are part of established housing developments. Some of these are at least twice the Town's minimum lot size (9,600 square feet), meaning that the potential for subdivision and development exists, although currently subdivisions are under Pierce County's permitting authority. Many of the parcels in and along the shoreline are identified as "redevelopable."

There are two principal land uses in the eastern portion of the shoreline planning area. One is the airport and the other is the Lynch Creek Quarry. Some of the airport's infrastructure may be located within the planning area and new development related to the airport is possible. The Aerospace zoning district also allows commercial, industrial, and residential uses (EMC 18.04.185).

The Lynch Creek Quarry is located in the Town's UGA. In general, quarry operations are located outside the 200-foot shoreline planning area and Lynch Creek critical area buffers. The owners of the quarry have submitted a conditional use permit to Pierce County for continued mining for the next 5-10 years. All proposed mining activities would be outside of the shoreline planning area (200 feet from the OHWM).

Beyond the current operating permit of 5 – 10 years, the Town is developing a subarea plan for redevelopment of the area occupied by the quarry. Under the draft subarea plan, 86 acres of the quarry would be annexed to the Town and zoned for industrial uses. The subarea is located between Lynch Creek and the Mashel River. The concept of the plan is to create industrial development clusters, separated by roads and green space corridors. While the subarea plan proposes to introduce new industrial uses to the area, it would also represent an opportunity for the Town to reclaim some of the quarry area and implement creek enhancement or restoration as part of any proposed development. Generally, future development would be required to occur outside the 200 foot critical area buffers, which would leave the shoreline largely undeveloped. Figure 3 shows the parcels that are wholly or partially within 200 feet of the creek's centerline. Vacant and under-developed parcels are shown as well as parcels large enough to subdivide in to two or more lots.

Figure 3. Potentially Developable Parcels along Lynch Creek

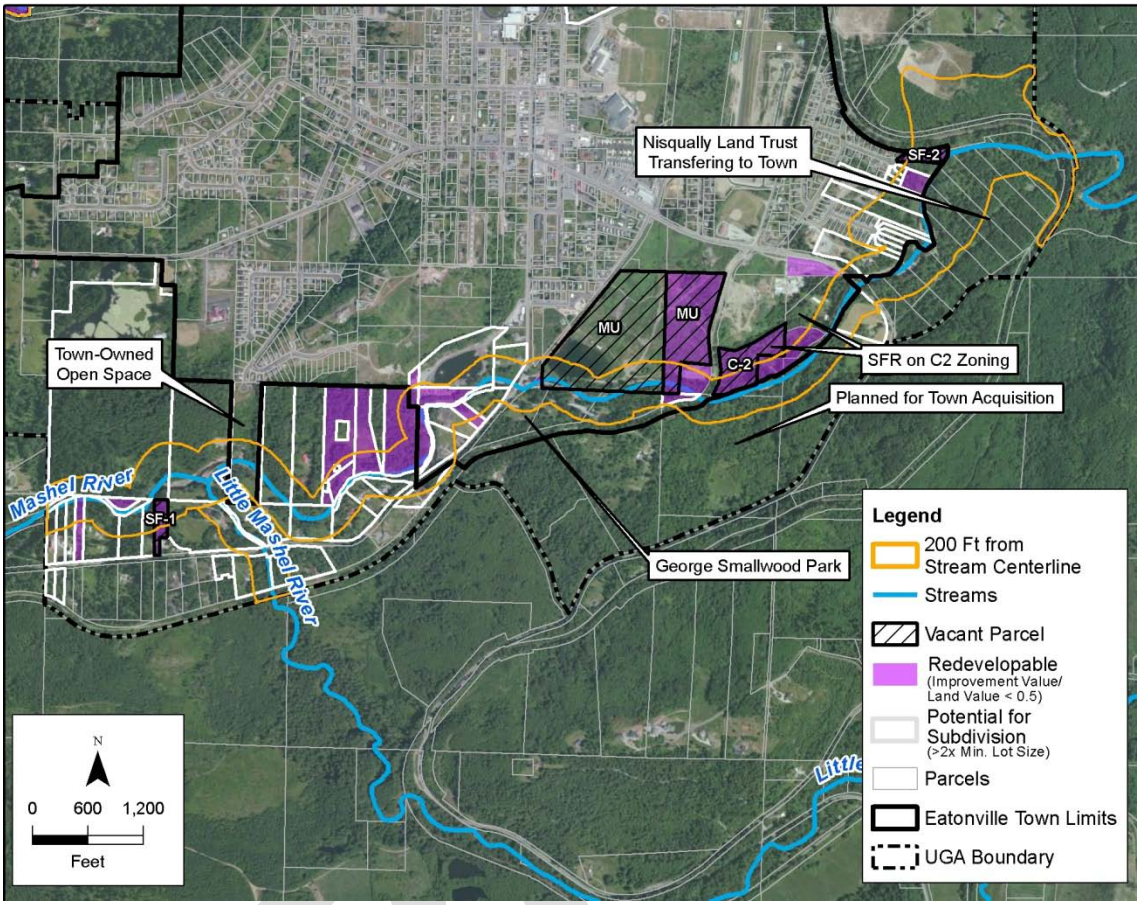


3.3 Mashel River

Pierce County Assessor's data and Town zoning indicates that zoning in the shoreline planning area is varied and there is the potential for increased residential, commercial, and mixed use development along the river. Excluding properties owned by the Nisqually Land Trust, the Town, and those planned for acquisition, there are two vacant parcels adjacent to the river that are zoned for single-family development. These parcels are both at least twice the minimum lot size (9,600 square feet), meaning that the potential for subdivision and further development exists.

There are two large parcels (41 acres combined) zoned Mixed-use adjacent to the river. Both are currently undeveloped but could accommodate multi-family development at a density of 15 units/acre or mixed use development at 23 units/acre. These parcels represent an opportunity to accommodate water-oriented uses as part of mixed-use developments. There are three parcels zoned for commercial use adjacent to the river. One of the parcels is identified as vacant and one has a residence on it. These parcels have the potential for commercial development and increased land use intensity. Future development on these parcels would be required to occur outside the 200 foot critical area buffers, which would leave the shoreline largely undeveloped. Figure 4 shows the parcels that are wholly or partially within 200 feet of the creek's centerline. Vacant and under-developed parcels are shown as well as parcels large enough to subdivide in to two or more lots.

Figure 4. Potentially Developable Parcels along the Mashel River



3.4 Little Mashel River

The Little Mashel River is wholly in the Town's UGA. A review of Pierce County Assessor's land use data indicates that there are four private properties in the Little Mashel shoreline planning area, all of which are zoned for single-family development and all of which have residences on them. The parcels range in size from four to nine acres, meaning that the potential for subdivision and further development exists.

4.0 PROTECTIVE PROVISIONS OF THE PROPOSED SMP

4.1 Shoreline Environment Designations

The assignment of Shoreline Environmental Designations (SEDs) is the one of the principle tools for regulating shoreline uses to achieve the policy goals of the SMA and the Draft SMP. Local SMPs establish a system to classify shoreline areas into specific SEDs. The purpose of a shoreline environment designation system is to provide a uniform basis for applying policies and use regulations within distinctly different shoreline areas. Generally, environment designations are based on biological and physical capabilities and limitations of the shoreline, existing and planned development patterns, and a community's vision or objectives for its future development.

SEDs act as a zoning overlay, providing an additional layer of policy and regulations that apply to lands within the SMP jurisdiction. The Town of Eatonville has been using the Pierce County SMP to plan for and regulate uses along its shorelines. That document was adopted in 1975 and revised in 1981; it has not been revised since. Under the current SMP, the Town's shorelines are designated as one of three environments: Shoreline Residential, Urban Conservancy, or Public Conservancy.

Environmental designations in the proposed Draft SMP have been altered from the existing designations. Regulation of uses and shoreline modifications associated with each designation is generally most restrictive or protective for "Natural" areas, followed by "Urban Conservancy," and "Shoreline Residential." Proposed shoreline environment designations have been assigned to reflect the specific conditions of each of the shoreline reaches. As such, the SEDs for some properties have changed.

The only portion of the Town previously designated as Public Conservancy, at Smallwood Park, is now given an Urban Conservancy designation, which is intended 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 right bank of the eastern end of the Mashel River, from approximately Weyerhaeuser Road S. to the eastern UGA boundary, was previously a mix of Urban Conservancy, Public Conservancy and Shoreline Residential. It is now designated Natural because most of the lands are publically owned and planned for recreational uses and restoration projects.

Previously, all of Ohop and Lynch Creeks, as well as the left bank of the Mashel River east of Mashel Avenue S., were designated Shoreline Residential. The proposed designations include a mix of Shoreline Residential and Urban Conservancy. The remainder of the Mashel River, west of Mashel Avenue S., and all of the Little Mashel River, were previously designated Urban Conservancy. These areas are now a mix of Urban Conservancy and Shoreline Residential. These changes are intended to provide more ecological protection to those areas that have less development, or are less likely to be developed in the future, and to provide for development that is consistent with the proposed SMP.

4.2 Use Regulations and Development Standards

The Draft SMP includes policies and regulations that require new or expanding developments to achieve "no net loss" of shoreline functions. This is achieved through implementation of development standards, mitigation requirements and other regulatory provisions. The Draft SMP proposes several changes to the shoreline policies and development regulations that encourage shoreline conservation and prohibit development activities that would cause adverse impact to shoreline functions and processes. The proposed changes to development standards and use regulations are, in general, more protective than the existing SMP. Key elements of the Draft SMP that will assure "no net loss" of ecological functions include the adoption of the Town's critical areas standards, new vegetation conservation measures and shoreline stabilization measures. Additional provisions of the Draft SMP that will assure no net loss are detailed in Table 2. They are presented by shoreline function.

4.3 Critical Areas

The most significant changes in regulating development in the shorelines is the adoption of the Town's critical areas standards (EMC 15.16). These did not exist when the existing SMP was adopted. Although critical areas in

shoreline jurisdiction are to be identified and designated under the GMA, they must also be protected under SMA. According to Engrossed Senate Bill 1651 passed in 2010, once the Town updates its SMP, critical areas within shoreline jurisdiction will be protected under the SMA and are no longer subject to the procedural and substantive requirements of the GMA. The SMP must protect those critical areas such that there is "no net loss of shoreline ecological functions necessary to sustain shoreline natural resources" as defined by the SMP Guidelines.

The Draft SMP adopts the existing critical area standards and applies those protections to the Town's shorelines. All four of the Town's SMA waterbodies are classified as Habitat Conservation Areas consistent with the EMC 15.16.172. The following critical areas standards will apply through the critical area standards:

- A 200 foot stream buffer is applied to all streams that are subject to the Shoreline Management Act (EMC 15.16.174(K)).
- Critical areas and their buffers must be left undisturbed with some exceptions (15.16.113(B)).
- The Town shall require buffers of undisturbed native vegetation adjacent to habitat conservation areas as necessary. Buffer widths shall reflect the sensitivity of the habitat and may reflect the intensity of nearby human activity (EMC 15.16.175(D)).
- No development shall be allowed within a habitat conservation area or buffer with which state or federal endangered, threatened, or sensitive species have a primary association, except in exchange for restoration as approved by the director or as provided in a management plan approved by a state or federal agency with appropriate expertise (EMC 15.16.175(F)).
- No development shall be permitted which degrades the functions or values of anadromous fish habitat, including structures or fills which impact migration or spawning (EMC 15.16.175(H)).

The proposed Draft Shoreline Master Program includes new requirements for vegetation conservation and enhancement. In addition to the vegetation conservation required through the critical area standards, the Draft SMP also proposes regulations requiring shoreline development to maintain existing native shoreline vegetation to the maximum extent practicable. It also requires that vegetation clearing be limited to the minimum necessary to accommodate approved shoreline uses and developments.

Shoreline stabilization represents one of the key threats to shoreline functions. Under the Draft SMP new hard shore armoring is prohibited (consistent with EMC (EMC 15.16.175(J)). Bioengineered and soft shore measures are allowed, but only as a conditional use. Replacement of existing structures is allowed as a conditional use when a primary structure is in imminent threat from erosion.

The proposed changes to development standards and use regulations are, in general, more protective than the existing SMP. New development would be required to meet the Town's critical area standards and meet the policy intent and development standards of the SMP. As redevelopment occurs, the policies and regulations in the SMP require that development be located and designed in a manner that avoids impacts to ecological functions and/or enhances functions where they have been degraded.

4.4 Restoration Opportunities

In addition to the application of shoreline environment designation and use regulations, the Draft SMP includes a Shoreline Restoration Plan (ESA, 2011). The restoration plan identifies projects, programs, and plans that are

or would be implemented through the Town's existing efforts, including the comprehensive plan, critical areas regulations, and storm and surface water utility. The plan also identifies projects and programs being implemented by regional agencies, Tribes, and conservation groups. The restoration plan also identifies restoration programs and projects that the Town could undertake to improve shoreline function over time. These take the form of programmatic actions and specific restoration actions for each waterbody. The following programmatic actions are proposed:

Public Education and Landowner Incentives

- Provide public education to help reduce turbidity and maintain good water quality in Lynch and Ohop Creeks. For example, involve residents in stenciling storm drains with "drains to stream" symbols to remind people not to dispose of toxic materials in the storm system.
- Educate residents and businesses in the Town about methods to reduce erosion and use of chemicals (e.g., fertilizers, pesticides).
- Educate property owners about proper vegetation/landscape maintenance (including preservation of native vegetation along stream/nearshore riparian corridors) to promote shore stabilization and protect water quality.
- Educate private property owners about the negative impacts of shore armoring and encouraging soft shore protection where shore protection is unavoidable.
- Provide incentive programs for shoreline property owners, such as transfer or purchase of development rights and tax incentives, for shoreline restoration and protection.
- Provide information for shoreline property owners through a web page and/or public workshops.

Stormwater Management

- Finalize and adopt an updated stormwater ordinance and stormwater management plan.
- Encourage and provide incentives for low impact development practices for private property owners.
- Retrofit existing public stormwater systems using Low Impact Development (LID) strategies, as funding allows.

The specific restoration action identified in the restoration plan include managing invasive vegetation, revegetating riparian areas, installing LWD, and removing shoreline armoring. The following table (Table 2) summarizes the types of actions proposed for each water body. Complete descriptions and maps are provided in the Restoration Plan.

Table 2. Restoration Action Summary

Water Body	Control Non-native Invasive Vegetation in Riparian Areas	Revegetate Riparian Areas	Install LWD in Channel	Remove/ Replace Shoreline Armoring
Ohop Creek	X	X	X	
Lynch Creek	X	X		
Mashel River	X	X		X
Little Mashel	X	X		

4.5 Beneficial Effects of Established Regulatory Programs

A variety of other regulatory programs, plans, and policies work in concert with the Town's SMP to manage shoreline resources and regulate development near the shoreline. The Comprehensive Plan establishes the general land use pattern of growth and development the Town has envisioned for areas both inside and outside the shoreline jurisdiction. Various sections of Eatonville's Municipal Code (EMC) are relevant to shoreline management, such as EMC Title 18 Zoning Code, which contains zoning and development standards. The Town's development standards and use regulations for environmentally critical areas (EMC Chapter 15.16) are particularly relevant to the Town's SMP.

A number of state and federal agencies have jurisdiction over land or natural elements in the Town's shoreline jurisdiction. In general, local development proposals trigger requirements for state or federal permits when they impact wetlands or streams, potentially affect fish and wildlife listed under the federal Endangered Species Act (ESA), result in over one acre of clearing and grading, affect the floodplain or floodway, or involve in-water or over-water activities. As with local requirements, state and federal regulations may apply throughout the town, but regulated resources are common within the Town's shoreline jurisdiction. The state and federal regulations affecting shoreline-related resources include, but are not limited to the following regulations:

Endangered Species Act (ESA):

The federal ESA addresses the protection and recovery of federally listed species. The ESA is jointly administered by the National Oceanic and Atmospheric Administration (NOAA) Fisheries (formerly referred to as the National Marine Fisheries Service), and the United States Fish and Wildlife Service (USFWS).

Clean Water Act (CWA):

The federal CWA requires states to set standards for the protection of water quality for various parameters, and it regulates excavation and dredging in waters of the U.S., including wetlands. Certain activities affecting wetlands in the Town's shoreline jurisdiction or work in the adjacent rivers may require a permit from the U.S. Army Corps of Engineers and/or Washington State Department of Ecology under Section 404 and Section 401 of the CWA, respectively.

Federal Emergency Management Agency (FEMA) National Flood Insurance Program:

Communities that participate in the National Flood Insurance Program receive federally backed flood insurance. In order to participate, the community must adopt and enforce floodplain management ordinances, which reduce future flood damage. The National Flood Insurance Program is also responsible for mapping the Town's flood hazard areas.

Hydraulic Project Approval (HPA):

The Washington Department of Fish and Wildlife (WDFW) regulates activities that use, divert, obstruct, or change the natural flow of the beds or banks of waters of the state and which may affect fish habitat. Projects in the shoreline jurisdiction requiring construction below the ordinary high water mark of Puget Sound or streams in the town could require an HPA from WDFW. Projects creating new impervious surface that could substantially increase stormwater runoff to waters of the state may also require approval.

National Pollutant Discharge Elimination System (NPDES):

Ecology regulates activities that result in wastewater discharges to surface water from industrial facilities or municipal wastewater treatment plants. NPDES permits are also required for stormwater discharges from industrial facilities, and construction sites of one or more acres.

4.6 Assessment of Protective SMP Policies, Regulations and Restoration Actions

Table 2 identifies the policies and regulations from the Draft SMP that would protect ecological functions along with the provisions of the draft Restoration Plan (ESA, 2011) that will enhance functions over time. Based on this information, the future performance of shoreline functions is assessed and noted as conclusions.

Table 3. Summary of Protection Provisions and Assessment of Future Performance of Shoreline Functions: Hydrology and Hyporheic Functions:

SMP Provisions: Protection and Restoration Protection = Proposed SMP regulations (with reference to SMP section number) Restoration = Draft Restoration Plan Objectives
PROTECTION: **Shoreline stabilization standards:** • Structural shoreline stabilization is prohibited in all SEDs, Bio-engineered or soft shore stabilization is permitted in all shoreline environments as a conditional use (SMP 5.1.2(1)). • New development must be located and designed to avoid the need for future shoreline stabilization to the extent feasible. Subdivision of land shall be regulated to assure that lots created will not require shoreline stabilization in order for reasonable development to occur (SMP 5.1.2(2)). • Replacement or repair of existing shoreline stabilization is only allowed when it has been demonstrated that it is necessary to protect an existing primary structure development, human safety, or restoration/remediation. (SMP 5.1.2(5)). • In conjunction with any stabilization project, shoreline vegetation shall be protected and restored along or near shorelines to protect and restore the ecological functions and ecosystem-wide processes and to protect human safety and property(SMP 5.1.2(8)). **In-stream structures** • In-stream structures shall only be allowed when associated with an adopted watershed management plan, surface water management plan or restoration plan (5.4.2(1). **Dredging** • Dredging waterward of the OHWM shall only be allowed as a conditional use and when necessary to support the following: 1. A publicly-sponsored ecological restoration or enhancement project that improves shoreline ecological functions and processes benefiting water quality and/or fish and wildlife habitat; 2. A Town-approved restoration and mitigation project that involves removal of structural shoreline armoring and/or installation of shoreline vegetation enhancements; or 3. A bio-engineered shoreline stabilization project, including bio-engineered shoreline stabilization associated with private residential development or public projects. Dredging may be allowed in the Aquatic environment by a conditional use permit. Dredging is prohibited in all other SEDs except when associated with a restoration project (SMP 5.3.1(1)). • Dredging may be permitted as a conditional use for removal of gravel, sediment, or buried wood debris for flood management purposes consistent with an adopted flood hazard reduction plan and only after a biological and geomorphological study demonstrates that extraction has a long term benefit to flood hazard reduction, does not result in a long-term degradation of fish habitat, and is part of a comprehensive flood management solution (SMP 5.3.1(2)). **Fill, Excavation, Ditching, Clear and Grade** • Fill, excavation, ditching, clearing and grading is allowed in the shoreline only in association with a permitted use. Where allowed, the activity shall be the minimum necessary to accommodate the development (5.2.2(2)). • Fill shall be permitted only where it is demonstrated that the proposed action will not: • Result in significant ecological damage to water quality, fish, and/or wildlife habitat; or • Adversely alter natural drainage and circulation patterns, currents, creek/river flows or significantly reduce flood water capacities or inhibit channel migration (5.2.2(4)).

SMP Provisions: Protection and Restoration
Protection = Proposed SMP regulations (with reference to SMP section number)
Restoration = Draft Restoration Plan Objectives

- Filling, and/or excavation waterward of the OHWM may be allowed when necessary to support the following:
  - Publicly sponsored ecological restoration or enhancement projects;
  - Town-approved restoration and mitigation projects that involve removal of shoreline armoring or installation of shoreline vegetation enhancements;
  - Bio-engineered shoreline stabilization projects, including bio-engineered shoreline stabilization associated with private residential development;
  - Publicly-sponsored non-restoration projects that provide public access or improve access to the shoreline for a substantial number of people;
  - Expansion or alteration of public transportation facilities currently located in the shoreline where there is no feasible alternative (5.2.2(5)).
- Fill, excavation, ditching, clearing or grading shall not be located where structural shore stabilization will be required to maintain materials placed or removed. Disturbed areas shall be immediately stabilized and re-vegetated, as applicable (5.2.2(7)).

Water Quality

- All new development or re-developing properties shall be required to connect to the Town's sanitary sewer lines where sewer service is available (4.7.2(1)).
- Shoreline use and development shall incorporate all known, available, and reasonable methods of preventing, controlling, and treating stormwater to protect and maintain surface and ground water quantity and quality in accordance with the Town's stormwater management and erosion control regulations (EMC 18.54) as well as the Town's critical aquifer recharge area provisions of the critical areas code (EMC 15.16.141 – 15.16.147) (4.7.2(2)).
- All materials that may come in contact with water shall be composed of non-toxic materials, such as untreated wood, concrete, approved plastic composites or steel, that will not adversely affect water quality or aquatic plants or animals (4.7.2(3)).

Commercial Use

- Commercial development, including all accessory structures shall be prohibited in, on, or over water or within floodways (6.3.2(5)).

Residential Use

- New residential development, including all accessory structures shall be prohibited in, on, or over water or within floodways (6.5.2(6)).
- Residential development and appurtenances shall be located sufficiently landward of the ordinary high water mark to preclude the need for new structural shoreline stabilization and/or flood protection or structures that limit channel migration for the useful life of the structure (6.5.2(7)).
- Residential structures and subdivision of land for residential lots shall not be approved when structural flood protection or shoreline stabilization measures will be necessary to protect new development or lots (6.5.2(8)).

Transportation and Parking

- New transportation facilities should be located outside of shoreline jurisdiction unless there is no reasonably feasible alternative alignment or location or they are required to access a permitted use and then, they should be the minimum width possible (6.6.1(1)).
- New transportation facilities should be located and designed to minimize the need for shoreline protection measures, modifications to natural drainage systems, and crossing waterways. Stormwater impacts should be managed consistent with EMC chapter 16.54, Stormwater Management and Erosion Control (6.6.1(2)).
- New transportation facilities may be located within shoreline jurisdiction only when alternative locations are not

SMP Provisions: Protection and Restoration Protection = Proposed SMP regulations (with reference to SMP section number) Restoration = Draft Restoration Plan Objectives
feasible, and if permitted, they should be the minimum width needed for access (6.6.2(2)). • New transportation facilities shall be located and designed to preclude the need for shoreline stabilization and structural flood protection (6.6.2(7)). • Vehicle and pedestrian circulation systems shall be designed to minimize clearing, grading and alteration of topography and natural features. Roadway and driveway alignment shall follow the natural contours and minimize width to the maximum extent feasible (6.6.2(8)). **Utilities** • Upon completion of utility installation/maintenance projects on shorelines, banks shall be restored to pre-project configuration, replanted and provided with maintenance care until the newly planted vegetation is established. Plantings shall be native species and/or be similar to vegetation in the surrounding area (6.7.2(4)). **RESTORATION**: The following actions from the Town's Restoration Plan are aimed at improveing hydrological functions along the shorelines: • Install LWD in Channel • Remove/ Replace Shoreline Armoring • Revegetate Riparian Areas **CONCLUSIONS:** **No loss of function or Improvement of hydrologic processes:** New policies and regulations that prohibit hard shoreline armoring and indicating a preference for bio-engineered or soft shore stabilization along with critical areas buffers will maintain or improve hydrological functions, such as the link between the land and water, channel complexity, connection to the floodway and flood plain. Mitigation requirements and restoration efforts offer opportunity for further shoreline enhancements. **No loss of function in water quality:** Regulations would limit any additional impacts to wetlands, and any impacts would be mitigated. Requirement to connect to sewer system would prevent new adverse impacts from failing septic systems.

Table 4. Summary of Protection Provisions and Assessment of Future Performance of Shoreline Functions: Shoreline Vegetation and Habitat

SMP Provisions: Protection and Restoration Protection = Proposed SMP regulations (with reference to SMP section number) Restoration = Draft Restoration Plan Objectives
PROTECTION: **Critical Areas** • The Town's critical area standards are incorporated into the Draft SMP, including buffer provisions for shorelines of the state and mitigation requirements (4.3.2(1)). **Shoreline Vegetation Conservation** • Vegetation conservation and management in shoreline areas should include removal of non-native invasive plant species and noxious weeds as needed to facilitate establishment of stable native plant communities (4.6.1(2)).

- Woody debris should be left in stream corridors to enhance wildlife habitat and shoreline ecological functions, except where it threatens personal safety or public infrastructure such as bridge pilings, roads or flood control structures (4.6.1(3)).
- To conserve and maintain shoreline vegetation, shoreline use and development shall comply with the buffer and habitat conservation area standards established in EMC 15.16 as adopted by reference in Section 4.3. Shoreline uses and developments shall also comply with the Town's setback standards established in EMC 18.04 (zoning district regulations); landscaping regulations in EMC 18.07; and Stormwater Management and Erosion Control regulations in EMC 16.54 (4.6.2(1)).
- Proponents of all new shoreline uses or developments shall maintain existing native shoreline vegetation to the maximum extent practicable (4.6.2(2)).
- Vegetation clearing shall be limited to the minimum necessary to accommodate approved shoreline uses and developments (4.6.2(3))

Shoreline Stabilization

- In conjunction with any stabilization project, shoreline vegetation shall be protected and restored along or near shorelines to protect and restore the ecological functions and ecosystem-wide processes and to protect human safety and property investments (5.1.2(8)).

Commercial Use

- Commercial development and use should be prohibited in the Natural Environment (6.3.2(1).

Residential Use

- Residential development should be designed to preserve existing shoreline vegetation, control erosion, protect water quality using best management practices, and to utilize low impact development techniques where appropriate (6.5.1(1)).
- New residential development should provide adequate building setbacks and natural vegetated buffers to protect and restore ecological functions and processes, to preserve views, and to minimize use conflicts (6.5.1(3)).
- The Town should encourage voluntary enhancement and restoration of high-functioning vegetated buffers and natural or semi-natural shorelines (6.5.1(4)).
- New residential development is prohibited in the Natural Environment (6.5.2(4)).
- Multi-family residential development in the Urban Conservancy environment shall be located a minimum distance of 200 feet from the OHWM (6.5.2(5)).

Transportation and Parking

- New transportation facilities and improvements to existing transportation facilities, not including public trails, shall be located outside of the critical areas buffer (as prescribe in EMC 15.16), unless there is no feasible alternative. Any required impacts within the shoreline shall meet the standards of mitigation, as specified in section 4.2.3(3) of this Program (6.6.2(5)).
- Parking as a stand alone use shall not be allowed in any shoreline environment (6.6.2(9)).

Utilities

- Utility installation or maintenance projects in shorelines should restore areas to pre-project configuration, replant with native species and provide maintenance care until the newly planted vegetation is established (6.7.1(6).

RESTORATION:
The following objectives from the Town's Restoration Plan are aimed at achieving no net loss of ecological functions along the Town's shorelines:

TO BE INCLUDED UPON COMPLETION OF THE RESTORATION PLAN

CONCLUSIONS:

No loss of function or improvement of shoreline vegetation and habitat:

Critical areas standards and buffers along with mitigation requirements have the potential to increase native vegetation, habitat and sources of LWD along the shorelines. Vegetation conservation requirements will limit the future loss of shoreline vegetation; and mitigation requirements have the potential to improve native vegetation along shorelines. Restoration efforts will increase the amount of intact habitat along the Town's shorelines.

Table 5. Summary of Protection Provisions and Assessment of Future Performance of Shoreline Functions: Water Quality Functions:

SMP Provisions: Protection and Restoration
Protection = Proposed SMP regulations (with reference to SMP section number)
Restoration = Draft Restoration Plan Objectives

PROTECTION:

Water Quality:

- The Town will promote the use of low impact development techniques through incentives, permit requirements, and adopted Town plans and policies.
- New development or re-developing properties are required to connect to the Town's sanitary sewer lines where sewer service is available (4.7.2(1)).
- Shoreline use and development must incorporate reasonable methods of preventing, controlling, and treating stormwater in accordance with the Town's stormwater management and erosion control (4.7.2(2)).
- All materials that come in contact with water must be composed of non-toxic materials that will not adversely affect water quality or aquatic plants or animals (4.7.2(3)).

Critical Areas

- The Town's critical area standards are incorporated into the Draft SMP, including buffer provisions for shorelines of the state and mitigation requirements (4.3.2(1)).

Vegetation conservation

- All new shoreline uses or developments shall maintain existing native shoreline vegetation to the maximum extent practicable (4.6.2(3)).
- Vegetation clearing shall be limited to the minimum necessary to accommodate approved shoreline uses and developments (4.6.2(4)).

Fill, Excavation, Ditching, Clear and Grade

- Fill, excavation, ditching, clearing and grading is allowed in the shoreline only in association with a permitted use. Where allowed, the activity shall be the minimum necessary to accommodate the development (5.2.2(2)).
- Fill shall be permitted only where it is demonstrated that the proposed action will not:
    - Result in significant ecological damage to water quality, fish, and/or wildlife habitat; or
- Filling, and/or excavation waterward of the OHWM may be allowed when necessary to support the following:
    - Publicly sponsored ecological restoration or enhancement projects;
    - Town-approved restoration and mitigation projects that involve removal of shoreline armoring or installation of shoreline vegetation enhancements;
    - Bio-engineered shoreline stabilization projects, including bio-engineered shoreline stabilization associated with private residential development;
    - Publicly-sponsored non-restoration projects that provide public access or improve access to the shoreline for a substantial number of people;

SMP Provisions: Protection and Restoration
Protection = Proposed SMP regulations (with reference to SMP section number)
Restoration = Draft Restoration Plan Objectives

- Expansion or alteration of public transportation facilities currently located in the shoreline where there is no feasible alternative (5.2.2(5)).

Prohibited Uses:

- Mining and Industrial uses are prohibited in the shoreline (6.1).

Residential

- Residential development shall achieve no net loss of ecological function (6.5.2(1).
- New residential development is prohibited in the Natural Environment (6.5.2(4)).
- Residential development proposals shall be accompanied by a plan indicating methods for erosion control during and following construction in accordance with EMC 16.54
- All residential development shall comply with the sewage disposal and water supply facilities required under EMC 13.04 and 13 (6.5.2(11)).

Transportation and Parking

- New transportation facilities should be located outside of shoreline jurisdiction unless there is no reasonably feasible alternative alignment or location or they are required to access a permitted use and then, they should be the minimum width possible (6.6.1(1)).
- New transportation facilities should be located and designed to minimize the need for shoreline protection measures, modifications to natural drainage systems, and crossing waterways. Stormwater impacts should be managed consistent with EMC chapter 16.54, Stormwater Management and Erosion Control (6.6.1(2)).
- New transportation facilities may be located within shoreline jurisdiction only when alternative locations are not feasible, and if permitted, they should be the minimum width needed for access (6.6.2(2)).
- Vehicle and pedestrian circulation systems shall be designed to minimize clearing, grading and alteration of topography and natural features. Roadway and driveway alignment shall follow the natural contours and minimize width to the maximum extent feasible (6.6.2(8)).

Utilities

- Upon completion of utility installation/maintenance projects on shorelines, banks shall be restored to pre-project configuration, replanted and provided with maintenance care until the newly planted vegetation is established. Plantings shall be native species and/or be similar to vegetation in the surrounding area (6.7.2(4)).

RESTORATION:
The following actions from the Town's Restoration Plan are aimed at improveing hydrological functions along the shorelines:

- Install LWD in Channel
- Remove/ Replace Shoreline Armoring
- Revegetate Riparian Areas

CONCLUSIONS:

No loss of function or Improvement of hydrologic processes:

No Change

Water quality in the Town's portions of waters of the state are largely dependent on land use practices throughout the watershed. The proposed SMP additional protection of wetland areas associated with shorelines by applying critical areas buffers, requiring the preservation of shoreline vegetation, requiring connection to sewer system, and controlling clearing grading and fill. Stormwater upgrades at the Lynch Creek outfall could improve the water quality of runoff entering Lynch Creek and Ohop Creek.

5.0 ASSESSMENT OF CUMULATIVE IMPACTS

5.1 Method of Assessment

The assessment of cumulative impacts considers the impacts of reasonably foreseeable future development on existing conditions and then assesses whether the provisions of the proposed Draft SMP will, at the least, maintain shoreline functions at their present condition. Table 1 describes the existing performance of shoreline functions along Eatonville's shorelines as described in the Shoreline Inventory and Characterization report (ESA, 2010). Reasonably foreseeable future developments in the shoreline and their potential impacts are identified in section 3.0. Section 4 and Tables 2 and 3 identify the protective measures of the policies and regulations in the Draft Master Program and potential restoration efforts. Based on this information, a conclusion is drawn as to whether the conditions of shoreline functions will improve, remain the same or degrade over time.

5.2 Conclusion

As demonstrated above, when reasonably foreseeable shoreline developments are considered together with the policies and regulations in the Draft SMP, there would be no loss of ecological functions from the level established in the Shoreline Inventory and Characterization Report (ESA, 2010). Conclusions on the future performance of key shoreline functions are summarized as follows:

Hydrology: Loss in hydrological function from baseline is not expected and there is the potential for improvement. Eatonville's shorelines are relatively unarmored and regulations prohibit new hard armoring. Past forestry practices that increased sedimentation and produced changes in river morphology have largely ended and excess sediments are slowly being moved downstream. The Town's critical area standards limit development within most of the Town's shoreline jurisdiction, Lastly, in-stream structures are limited to restoration activities and in limited circumstances, utilities.

Shoreline Vegetation and Habitat: No further loss of this function is expected and there is a potential for improvement overtime under the Draft SMP. Past development practices removed shoreline vegetation altering the aquatic habitat through the loss of natural shading, food sources, and large woody debris. In-water wood is necessary for creating habitat structures for fish such as pools and refuges. Updated regulations protect existing riparian vegetation through critical area buffer standards; vegetation conservation provisions; limits on filling, clearing and grading; and mitigation sequencing. Riparian conditions are expected to improve through ongoing restoration projects. In the short-term, large woody debris is being increased as a part of current restoration efforts to place wood in the streams. In-stream wood is also being addressed in the long-term by increasing shoreline vegetation, the source of in-water wood.

Water Quality: Water quality is likely to remain unchanged or has the potential for improvement in the Town's shorelines. Regulations would limit any future impacts to wetlands and the creeks within the shoreline jurisdiction, and any impacts would be mitigated to achieve no net loss of ecological functions. SMP policies and regulations require that new development connect to sewer and any materials that come in to contact with the water must be composed of non-toxic materials. In addition, all development would be required incorporate reasonable methods of preventing, controlling, and treating stormwater and comply with the Town's stormwater management and erosion control regulations (EMC 18.54).

The outfall into Lynch Creek was identified as a source of pollutants and excess sediment. This outfall collect much of the stormwater from the Town, most of which lies outside the shoreline jurisdiction. The Town has undertaken steps to improve the treatment of stromwater entering Lynch Creek through implementation of low impact development projects.

To continue the trend toward improvement of shoreline ecological functions and decrease the likelihood of potential cumulative impacts to shoreline ecological functions during implementation, the Town should continue to develop plans and program that address the quality, quantity and timing of runoff entering the Lynch Creek outfall.

As described in the Shoreline Inventory and Characterization Report, past and ongoing uses in Eatonville's shorelines have lead to moderately altered shoreline functions. Development has lead to shoreline modifications that have altered natural hydrological processes, and resulted in loss of riparian vegetation which has altered habitats. However, as described above, updates to shoreline environment designations, adoption of critical areas standards, use regulations and development standards are likely to improve protection of shoreline functions.

In concert with implementation of restoration actions by the Town and other on-going state, tribal and federal projects and programs, the regulatory provisions of the Draft SMP would serve to maintain the overall condition of shoreline resources in the Town and in certain circumstances improve the overall condition.

6.0 REFERENCES

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