City of Snoqualmie
Grant No. G0800107

Shoreline Inventory and Characterization Report

for City of Snoqualmie

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City of Snoqualmie

Grant No. G0800107

Shoreline Analysis Report

Including Shoreline Inventory and Characterization for City of Snoqualmie's Shorelines: Snoqualmie River, South Fork Snoqualmie River, Kimball Creek and Borst Lake

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The views expressed herein are those of the authors and do not necessarily reflect the views of NOAA or any of its subagencies.

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Abbreviations and Acronyms

cfs	cubic feet per second
City	City of Snoqualmie
Corps	U.S. Army Corps of Engineers
DNR	Washington Department of Natural Resources
Ecology	Washington Department of Ecology
ELJ	Engineered log jams
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
LWD	Large wood debris
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
NWI	National Wetlands Inventory
OAHP	Office of Archaeology and Historic Preservation
RCW	Revised Code of Washington
RM	River Mile
SEPA	State Environmental Policy Act
SMA	Shoreline Management Act
SMP	Shoreline Master Plan
TMDL	Total Maximum Daily Load
UGA	Urban Growth Area
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife

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1.0 INTRODUCTION

1.1 BACKGROUND AND PURPOSE

The City of Snoqualmie (City) obtained a grant from the Washington Department of Ecology (Ecology) to conduct a comprehensive Shoreline Master Program (SMP) update. The first step of the update process is to inventory the City's shorelines as defined by the State's Shoreline Management Act (SMA) Revised Code of Washington (RCW) 90.58). The inventory was conducted according to direction provided in the Shoreline Master Program Guidelines (Washington Administrative Code [WAC] 173-26-201) and includes areas within current City limits. The shoreline inventory included in this Report describes existing biological and physical conditions, and uses Ecology's guidance to assess the baseline conditions for the qualitative extent of ecological functions provided via landscape-scale processes. Threats to these functions are provided, where evident, as well as recommendations for restoring processes and functions, where feasible. Ecology's Guidelines require that the City demonstrate that its updated SMP results in "no net loss" in ecological functions of the shoreline relative to the baseline.

A list of potential information sources relative to shorelines within the City was compiled and an information request letter was distributed to potential interested parties and agencies that may have relevant information (Appendix A). The collected information was supplemented with other resources such as City documents, GIS information, scientific literature, aerial photographs, internet data, and a brief site visit. The information collected and subsequent analysis follows the guidance established by Ecology. All maps are located in Appendix C.

This inventory underwent a limited and focused update in 2019 to highlight water quality issues and ensure consideration of water temperature considerations for the Snoqualmie River. Updates were initiated by the City based on public comments and stakeholder input received in 2017 and 2018. In the 2013 version of this document, water quality was discussed under the Wastewater and Stormwater Utilities section in Chapter 3, as well as in the Wastewater and Stormwater Utilities subsections for each shoreline segment in Chapter 4, as applicable. Although the information provided in these sections was not incorrect, it was difficult to find. As a result, a new Section 3.3 (Water Quality) was added to highlight and expand on this information. Additionally, a brief explanation of Section 303(d) of the Federal Clean Water Act was added to Section 2.2 (State and Federal Regulations), Figure 15 was added which shows the water quality status including "303(d) list" waters for the Snoqualmie River, and updates were made to Section 3.4.2 based on current City Stormwater Utility practices. New references were added and old/broken links were updated where possible.

1.2 SHORELINE JURISDICTION

As defined by the Shoreline Management Act (SMA) of 1971, lands subject to Shoreline jurisdiction include "waters of the state plus their associated "shorelands". At a minimum, waters of the state are streams whose mean annual flow is 20 cubic feet per second (cfs) or greater, and lakes whose area is greater than 20 acres. The shorelines of the state within the City of Snoqualmie include: main stem

of the Snoqualmie River; South Fork of the Snoqualmie River; Kimball Creek and; Mill Pond. In RCW 90.58.030, shorelands are defined as:

> *"Those lands extending landward for 200 feet in all directions as measured on a horizontal plane from the ordinary high water mark; floodways and contiguous floodplain areas landward 200 feet from such floodways; and all wetlands and river deltas associated with the streams, lakes, and tidal waters which are subject to the provisions of this chapter…Any county or city may determine that portion of a one-hundred-year-floodplain to be included in its master program as long as such portion includes, as a minimum, the floodway and the adjacent land extending landward two hundred feet there from…Any city or county may also include in its master program land necessary for buffers for critical areas."*

The SMA further designates some shorelines as shorelines of statewide significance. Shorelines of statewide significance include portions of Puget Sound and other marine water bodies, rivers with mean annual flow of 1,000 cfs or greater, and freshwater lakes 1,000 acres or larger. The shorelines of the Snoqualmie River are the only shorelines of statewide significance within the City of Snoqualmie (Figure 1 in Appendix C).

The shoreline jurisdiction in the City of Snoqualmie was adopted by reference pursuant to the Shoreline Management Act of 1971 (RCW 90.58). Policy and regulations are outlined in the Snoqualmie Shoreline Management Master Program in Chapter 19.08 of the Snoqualmie Municipal Code, adopted in 1986. At the time of adoption four different designations (19.08.060) were applied to the shoreline jurisdiction area. They are:

A. Natural Environment. The natural environment shall be that area along both banks of the Snoqualmie River within 200 feet of the ordinary high water mark, from a point 300 feet downstream from the crest of the Snoqualmie Falls to the northerly corporate limits.

B. Conservancy Environment. The conservancy environment shall be that area along both banks of Kimball Creek within 200 feet of the ordinary high water mark, from the confluence at Coal Creek to its mouth at the Snoqualmie River; the southwesterly bank of the Snoqualmie River, within 200 feet of the ordinary high water mark, from Bruce Street to a point 300 feet downstream from the crest of the Snoqualmie Falls; and that area along the north bank of the Snoqualmie River, within 200 feet of the ordinary high water mark, east from the SR 202 bridge crossing to the easterly corporate limit of the annexed property, approximately 950 feet upstream from the SR 202 bridge.

C. Urban Riverfront Environment. The urban riverfront environment is that area along the south bank of the Snoqualmie River within 200 feet of the ordinary high water mark, from the easterly corporate limits to Bruce Street extended, and that area along the north bank of the Snoqualmie River within 200 feet of the ordinary high water mark, from the SR 202 bridge crossing to a point 300 feet downstream from the crest of the Snoqualmie Falls.

D. Urban Floodplain Environment. The urban floodplain environment is all that area within the 100-year floodplain not designated as natural, conservancy or urban riverfront. (Ord. 680 §1, 1992; Ord. 588 § 1, 1986).

1.3 STUDY AREA

The City of Snoqualmie is located in eastern King County in the southern portion of the Snoqualmie river valley. Most of the city lies within the floodplain or floodway of the Snoqualmie River. A section of the northern city boundary is bordered by approximately 4.3-miles of the main stem of the Snoqualmie River. The most notable feature of the Snoqualmie River within the City is Snoqualmie Falls, where the river drops 268 feet. The Falls are located at the northwestern corner of the city limits. The City of Snoqualmie encompasses approximately 6.5 square miles. Immediately to the southeast, the City is bordered by the City of North Bend. The City of Snoqualmie's Urban Growth Area (UGA) is located south of the City and is primarily comprised of existing single-family residential areas. The City's UGA covers approximately 2.4 square miles. Unincorporated areas of King County surround the remaining boundaries of the City.

The study area for the City of Snoqualmie Shoreline Characterization comprise of all land currently within the City's shoreline jurisdiction as well as areas north of the Snoqualmie River that were annexed subsequent to adoption of the City's current Shoreline Master Program. These areas include lands adjacent to the main stem Snoqualmie River, the south fork Snoqualmie River, Kimball Creek, as well as extensive associated floodplains and wetlands. The City will have shoreline jurisdiction of the lands currently within the UGA when the lands are annexed.

1.4 HISTORIC LAND USE CHANGES AND CURRENT SHORELINE CONDITION

The City of Snoqualmie's land use pattern has developed in response to the natural features of the valley and the historical use of the land. Nearly all facets of the City of Snoqualmie have been shaped or influenced by the Snoqualmie River. Due to geologic intrusions at the north end of the City, the Snoqualmie River has created a broad flat plain that has shaped the valley's natural and human history. Previous channels of the river have created numerous oxbow sloughs, bogs and wetlands throughout the City. The topography is generally very flat, but the overall drainage patterns typically flow north/northwest towards the River, eventually heading west/northwest over Snoqualmie Falls, the most defining landmark in this area.

The Snoqualmie Valley has experienced a wide variety of human activity and use, including tribal settlements, mining, logging, farming, tourism, transportation, and electrical power generation.

The rich soil of the floodplain allowed for the establishment of farms in the upper valley during the first half of the twentieth century. Over 100 years ago, the City of Snoqualmie was platted along the banks of the Snoqualmie River. The river has a history of frequent and severe flooding, and should development of the City have started in more recent times, it would likely not be located where it is today. Due to the potential for flooding, careful consideration and planning of land uses and

development within the floodplain is extremely important. Historic photos are located in Appendix B.

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2.0 CURRENT REGULATORY FRAMEWORK SUMMARY

2.1 CITY OF SNOQUALMIE REGULATIONS

In 1903, the City of Snoqualmie voted for incorporation. Chapter 19.08 of the Snoqualmie Municipal Code outlines the City's current Shoreline Management Regulations. The chapter outlines use regulations, conditional uses, variances, and requirements for Substantial Development Permits. Most uses, developments, and activities regulated in the City's SMP are also subject to the City's Comprehensive Plan, Zoning Code, and various other city, state and federal laws. State statute requires periodic updates of the City's Comprehensive Plan, and the City of Snoqualmie ensures consistency between the SMP and other City codes, plans and programs by reviewing each for consistency during these periodic updates.

2.2 STATE AND FEDERAL REGULATIONS

State and federal regulations most pertinent to development activities on lands subject to the City's Shoreline provisions include:

- Shoreline Management Act, Ch. 90.58 RCW
- Shoreline regulations, Chs. 173-18 – 173-27 WAC
- Section 303(d) of the Clean Water Act
- Section 404 of the Clean Water Act
- The Endangered Species Act
- Section 401 Water Quality Certification
- Washington State Hydraulic Code

In addition to those listed above, there are other federal regulations which may be applicable on lands within the Shoreline zone of the City. Depending on the circumstances, these regulations could include the National Environmental Policy Act, the Anadromous Fish Conservation Act, the Clean Air Act, or the Migratory Bird Treaty Act. In most instances these Federal regulations would only be implemented if an action was either federally initiated, federally funded, or required some other Federal permit.

In addition to federal regulations, there are other Washington State laws that are applicable to the City and its planning process such as the Growth Management Act; however it is not directly initiated by a proposed land-use action within the City's shorelines. The City implements the State Environmental Policy Act (SEPA) directly through its own SEPA official. The lead agency (in most cases, the City) is responsible for identifying and evaluating the potential adverse environmental impacts of a proposal. This evaluation is documented and, in most cases, sent to other agencies and the public for their review and comment.

Where reasonable and prudent, the update to the City's Shoreline Master Program will incorporate some of the relevant aspects of these regulations to assure clarity for applicants. However an

applicant remains legally responsible to obtain relevant state and federal permits, when a proposed action falls within state and federal regulations, in addition to applicable City permits.

In general, an application within the City's Shoreline zone will trigger a permit or review from the U.S. Army Corps of Engineers (Corps), National Marine Fisheries Service, U.S. Fish and Wildlife Service (USFWS), Ecology, or Washington Department of Fish and Wildlife (WDFW) only if the action is below the Ordinary High Water Mark of a Water of the U.S. or a Water of the State; or it poses some risk to a federally listed species or it's critical habitat. Involvement by state and federal agencies would be most often be triggered by discharge of fill or pollutants into water or wetlands. State and federal regulations also apply to the construction (or reconstruction) of docks, bulkheads, and other over-water structures.

Provided below is a summary of the key state and federal regulations pertaining to water or habitat within Shoreline zones within the City. An applicant may be subject to one or more of these regulations, in addition to the City's Shoreline program.

Section 303(d) of the Federal Clean Water Act

The goal of section 303(d) of the Clean Water Act is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters". The EPA delegates authority to states to implement section 303(d). States are required to list impaired waters (where there is a confirmed exceedance of a specific water quality criteria), and develop and implement Total Maximum Daily Load (TMDL) pollution control plans to bring impaired waters back into compliance. In Washington, the 303(d) list is maintained as part of the Water Quality Assessment (WQA) process. There are five impairment categories used in the assessment process:

- Category 1: Meets tested standards for clean waters.
- Category 2: Waters of concern, there is evidence of a water quality problem but not enough to show persistent impairment.
- Category 3: Insufficient data.
- Category 4: Waters that have impairment problems that are being resolved in one of three ways:
    - Category 4a: has an EPA-approved TMDL and implementation plan
    - Category 4b: has a pollution control program, similar to a TMDL plan, that is expected to solve the pollution problems.
    - Category 4c: is impaired by causes that cannot be addressed through a TMDL plan (e.g. low water flow, stream channelization, or dams).
- Category 5: Polluted waters that are in exceedance of one or more specific water quality criteria on the "303(d) list" and require a water improvement project. Category 5 waters are also called "303(d) list" waters (Ecology 2011a; 2019a).

Section 404 of the Federal Clean Water Act

The Corps regulates the "discharge of dredged or fill material into waters of the United States, including wetlands". The Seattle District of the Corps has an extensive regulatory program with

multiple sources of guidance located on their website (see Section 8 References). The Corps' legal authority to regulate fill or discharges in "waters of the U.S." overlaps some of the City's Shoreline provisions; there may be instances of actions that the City's Shoreline code allows but which the Corps implementation of Section 404 of the Clean Water Act may preclude or severely limit. An applicant who is proposing any fill or discharge in the Snoqualmie River, South Fork Snoqualmie River, Kimball Creek, or any of the associated floodplain, wetlands, or tributary streams (upstream of Shoreline jurisdiction) will likely be required to submit an application to the Corps for review. Examples of common activities within Shoreline jurisdiction that will also require a Corps permit would include placement or replacement of a bulkhead, placement or replacement of over-water structures; repair or installation of discharge pipes or fill for drainage systems: filling or grading wetlands, floodplains, or streams associated with the streams or rivers. Even activities that are undertaken to restore or create habitat improvements in these aquatic settings may require review and approval by the Corps.

The Corps requires applicants to document in sequence, the following actions: avoidance of adverse impacts to "waters", re-design of projects to minimize impacts to "waters", restoration of impacts to "waters" after the project is completed, and finally compensation of unavoidable adverse impacts. If a Corps permit is required for a project, the applicant may also be required to submit documentation to the National Marine Fisheries and/or National Oceanic and Atmospheric Administration (NOAA) Fisheries Service relative to the potential of their project to affect federally listed endangered species (see below for more detail). In addition, the requirement of a Corps permit also would require the project to meet the provisions of the Section 106 of the Historical Preservation Act.

Endangered Species Act

The Endangered Species Act (ESA) is carried out by the National Marine Fisheries Service (NOAA Fisheries) and USFWS (together known as The Services); each Service is responsible for a sub-set of the listed species. The ESA prohibits "take" of listed species or habitat critical to that species survival. "Take" within the ESA is defined as: "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." In general, the provisions of the ESA are triggered when an activity has the potential to affect federally listed species; or the action requires a federal permit (e.g., a Corps permit); or the project receives federal funding (e.g., Federal Highway Administration funding of public road project), is proposed by a federal agency; or occurs on federal land. Within the City of Snoqualmie, it is most likely that a project within Shoreline jurisdiction would trigger the provisions of the ESA (and require consultation with the Services) if it also triggered a Section 404 permit from the Corps.

Section 401 Water Quality Certification

Washington State has been delegated authority to implement Section 401 of the Federal Clean Water Act by the Corps. Ecology reviews, conditions, approves or denies certain actions that may result in discharges to "state waters", which includes wetlands. Washington State has state water quality standards that must be met; and actions which result in impacts to waters of the state can be subject to the provisions of Section 401 standards. Discharge of pollutants (or the potential thereof), filling,

grading, or other alterations to the Snoqualmie River, South Fork Snoqualmie River, Kimball Creek, or the associated floodplain, wetlands, and tributary streams above Shoreline jurisdiction, may be subject to review and approval to meet Ecology's 401 provisions.

Hydraulic Code

WDFW regulates aquatic habitats through Chapter 77.55 RCW (the Hydraulic Code). The Hydraulic Code gives the state the authority to review, condition, approve or deny "any construction activity that will use, divert, obstruct, or change the bed or flow of state waters." As applicable to the City of Snoqualmie's shoreline jurisdiction, actions that occur below the Ordinary High Water Mark of the rivers or stream, or their associated wetlands (or their tributaries outside Shoreline jurisdiction) will trigger the need to obtain a Hydraulic Project Approval from WDFW (WDFW 2011). Examples of activities include: stream alteration, culvert installation or replacement, pier and bulkhead repair or construction, etc.

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3.0 ELEMENTS OF THE SHORELINE INVENTORY

The following discussion identifies each of the required inventory elements for the jurisdictional shoreline (Table 3.1), sources of information for each element, and provides a City-wide narrative for each element. Shoreline-specific discussions, as needed, are found in Section 4. Photographs are included in Appendix B.

Table 3.1 Shoreline Planning Segments

Segment	Approximate Area (square feet)	Approximate Area (acres)
1—Left bank from northern city limits to bottom of Snoqualmie Falls.	566,280	13
2—Right bank from northern City limits to a point approximately 550 feet upstream of SR 202 bridge. Left bank from bottom of falls to SR 202 bridge.	1,354,716	31.1
3—Wastewater treatment plant area north of decommissioned sewer lagoons.	792,792	18.2
4—SR 202 bridge to a point approximately 2,640 feet south of Snoqualmie Parkway/SR 202 intersection.	470,448	10.8
5—Snoqualmie River left bank south of SR 202 bridge upstream to Northern Street. Kimball Creek right and left banks extending from its confluence with Coal Creek downstream to its confluence with the Snoqualmie River.	3,114,540	71.5
6—Snoqualmie River left bank from Northern Street to appoint approximately 375 feet upstream of the Meadowbrook Bridge.	958,320	22
7A—Historic downtown: includes all residential/commercial areas in the floodway and some in the floodplain.	13,329,360	306
7B—"island" of Middle School and Weber property	1,263,240	29
7C—"island" of farm area	1,568,160	36
7D—"island" of housing development	1,089,000	25
8—3 Forks Park, Meadowbrook Farm, forested area east of golf course, and wetlands.	33,018,480	758
9—Mt Si Golf course area south of Meadowbrook slough.	6,446,880	148
Subtotal	**63,971,856**	**1,468.6**
10- UGA Area southwest of historic downtown Snoqualmie	2,891,192	158.2
11- Snoqualmie River right bank starting at a point approximately 730 feet upstream of SR 202 bridge continuing upstream to Snoqualmie Valley trail bridge, including Borst Lake.	13,560,288	311.3
12- Old mill site area immediately north of Borst Lake and generally south of the Snoqualmie Valley trail.	9,483,012	217.7
TOTAL	**89,906,348 square feet**	**2,155.80 acres**

3.1 LAND USE PATTERNS

Table 3.2 Land Use, Zoning, and Shoreline Environments

Shoreline Area	Existing Land Use	Comprehensive Plan Designation	Existing Shoreline Environment Designation[1]
Segment 1	• Undeveloped riparian forest	• Parks/Open Space (6.53 acres/49.6 %) • Utility Park (6.63 acres/50.4%)	Natural
Segment 2	• Utility facilities • Parks • Businesses	• Utility Park (20.12 acres/64.3 %) • Business/Retail (0.91acres/2.9 %) • Parks/Open Space (4.54 acres/14.5%) • Residential (3.10 acres/9.9%)	Conservancy and Natural
Segment 3	• Undeveloped riparian forest	• Utility Park (18.9 acres/100.0%)	Urban Floodplain
Segment 4	• Vacant/open space	• Parks/Open Space (5.43 acres/50.3%) • Utility Park (0.46 acres/4.3%)	Urban Floodplain
Segment 5	• Undeveloped riparian forest	• Mixed Use (20.48 acres/28.7%) • Parks/Open Space (45.92 acres/64.3%) • Residential (2.67 acres/3.7%) • Utility Park (0.43 acres/0.6%)	Urban Floodplain and Conservancy
Segment 6	• Utility Facilities • Parks • Low density residential • Open Space	• Parks/Open Space (14.45 acres/66.7%) • Business/Retail (4.49 acres/20.7%) • Utility Park (0.68 acres/3.1%) • Residential (1.43 acres/6.6%)	Urban Riverfront
Segment 7A	• Open Space • Parks • Schools • Businesses • Low density residential • Museum	• Residential (175.42 acres/57.3%) • Business/Retail (22.66 acres/7.4%) • Parks/Open Space (42.85 acres/14.0 %) • Utility Park (0.79 acres/0.3%)	Urban Floodplain
Segment 7B	• School • Business	• Residential (19.02 acres/66.2%) • Planned Commercial/Industrial (6.24 acres/21.7%) • Parks/Open Space (1.16 acres/4.0%)	Urban Floodplain
Segment 7C	• Residential Farm	• Residential (34.10 acres/95.4%) • Parks/Open space (1.64 acres/4.6%)	Urban Floodplain

Shoreline Area	Existing Land Use	Comprehensive Plan Designation	Existing Shoreline Environment Designation[1]
Segment 7D	• Residential • Business	• Residential (16.66 acres/64.9%) • Business/Retail (2.29 acres/8.9%) • Office Park (5.10 acres/19.9%)	Urban Floodplain
Segment 8	• 3 Forks Natural Area • Meadowbrook Farm • Vacant forested open space	• Residential (140.54 acres/18.5%) • Parks/Open Space (595.77 acres/78.6%)	
Segment 9	• Golf course • Business • Trails	• Parks/Open Space (144.92 acres/97.9%)	
Segment 10 (UGA Area)	• Low Density Residential	• Residential (158.24 acres/100 %)	Conservancy
Segment 11	• Undeveloped Riparian Forest	• Parks/Open Space (311.28 acres/100%)	Conservancy
Segment 12	• Dirtfish auto racecourse • Business	• Planned Commercial/Industrial (207.92 acres/95.5%) • Utility Park (9.76 acres/4.5%)	High Intensity Shoreline

1- The existing shoreline environment designations listed for Segments 10 – 12 are existing King County shoreline environment designations; Segments 11 and 12 were in unincorporated King County at the time of the City's most recent Shoreline Master Program adoption.

3.1.1 Existing Land Use

The existing land use patterns in the City's shoreline jurisdiction are composed primarily of residential, commercial, parks and open space, utility park, school, and recreational areas. Open space and single-family residential are currently the predominant land uses, encompassing the majority of the shoreline jurisdiction. The parks, open space and recreational areas are mostly found within the eastern half of the shoreline jurisdiction along the main stem and south fork of the Snoqualmie River including a portion of the northern section of the shoreline jurisdiction. Immediately west of the parks and open space is primarily residential with smaller pockets of school and commercial land uses. North of the SR 202 bridge, land use within this area of the shoreline jurisdiction is largely utility park and open space, and the Dirtfish auto racing area located on the former Weyerhaeuser Snoqualmie Mill site. Table 3.2 presents existing land use by shoreline planning segment. The location of shoreline modification and structures located within the shoreline jurisdiction can be seen in Figure 7, Appendix C.

3.1.2 Zoning Classifications and Comprehensive Plan Land Use Designations

The 2007 Snoqualmie Comprehensive Plan land use map identifies a variety of land use designations within the City of Snoqualmie's shoreline jurisdiction to include residential, business/retail, office park, planned commercial/industrial, resource extraction, utility park and parks/open space (see Figure 2, Appendix C). The predominant comprehensive land use designations are residential and parks/open space. Table 3.2 presents the comprehensive land use designations percent coverage by shoreline planning segment.

The City of Snoqualmie's zoning designations generally follow land use designations from the City's comprehensive plan (see Figure 3, Appendix C). According to the 2009 City of Snoqualmie zoning map, all residential areas within the shoreline jurisdiction are zoned Constrained Residential (1 unit per 5 acres). The purpose of the Constrained Residential zone is to limit building density within the 100-year floodplain. The Commercial/Industrial zoning districts include Business General, Business Retail 1 and 2, Office Park, Planned Commercial/Industrial and Resource Extraction. The Conservation/Resource zoning districts include Parks and Open Space further defined as Open Space 1, 2 and 3. Utility Park is also included in this zone. Within the shoreline jurisdiction, Constrained Residential and Parks and Open Space occupy the largest portion of the shoreline area.

3.2 TRANSPORTATION

SR 202 is the main north-south road that runs through Snoqualmie's shoreline jurisdiction. Other smaller roads provide access to residential, UGA areas, and the downtown historic commercial district from SR 202. The SR 202 bridge crosses the Snoqualmie River just upstream of Snoqualmie Falls. Further upstream, the Meadowbrook Bridge crosses the Snoqualmie River. The Snoqualmie Valley railroad runs parallel to SR 202.

The City's 2012-2017 Capital Facilities Plan identifies 13 transportation projects within Snoqualmie's shoreline jurisdiction. Major projects involve road widening, pedestrian and bicycle paths/sidewalk construction, construction of a roundabout and pedestrian bridge, and bridge replacements. Transportation facilities are directly related to increased impervious surface, decreased water retention and water quality impacts. Thus it is essential to inventory potential transportation projects in order to determine shoreline function.

Transportation projects planned within the UGA are under the jurisdiction of King County. When the City and King County move forward with an annexation of property within the UGA, the public transportation projects planned within the UGA will be considered and the representative agencies will come to an agreement regarding who will be responsible for the improvements. Currently there are no projects planned within the UGA that are within the shoreline jurisdiction.

3.3 WATER QUALITY[1]

Across the entire Snoqualmie River watershed, there are several 303(d) listed impaired waters, including numerous tributary stream reaches with Category 5 listings and many mainstem Snoqualmie (and tributary stream) reaches with established TMDLs (Category 4 listings). Throughout the Snoqualmie River mainstem, TMDLs have been established for Temperature (Ecology 2011a), Fecal Coliform Bacteria, and Dissolved Oxygen (DO) (Ecology 1994a). For Snoqualmie River reaches within the City, Category 4 listing for both temperature and DO extend from below the Snoqualmie Falls upstream to approximately the Snoqualmie Valley Trail bridge crossing. The Category 4 listings for temperature and DO also apply to the lower reach of Kimball Creek (where located within the shoreline jurisdiction). Further upstream above the convergence of Coal Creek, Kimball Creek and East Fork Kimball Creek are also listed as Category 5 waters for pH. These same reaches are also listed as Category 4 waters for DO. The majority of mainstem of the Snoqualmie River within the City is a Category 1 water for bacteria. Upstream of Kimball Creek, the mainstem of the Snoqualmie River within the City is a Category 1 for ammonia. See Figure 15, Appendix C; additionally this and other water quality information can be viewed on the Washington State Water Quality Atlas (Ecology 2019b).

The *Snoqualmie River Basin Fecal Coliform Bacteria, Dissolved Oxygen, Ammonia-Nitrogen, and pH Total Maximum Daily Load: Water Quality Effectiveness Monitoring Report* (Ecology 2008) is discussed in Section 3.4.1 Wastewater Utilities below. In 2011, *the Snoqualmie River Basin Temperature Total Maximum Daily Load Water Quality Improvement Report and Implementation Plan* was developed by Ecology. This Report describes the elevated water temperature within the mainstem Snoqualmie and identifies actions to reduce temperatures.

As described in the Critical Areas sections of this Report, within the study area and especially downstream of the City below the Falls, the Snoqualmie River supports salmonid species including ESA listed species. The designated aquatic life uses for the Snoqualmie River watershed are core summer salmonid habitat, as well as salmonid spawning, rearing, and migration all occurring below the Snoqualmie Falls. In addition to downstream aquatic habitats and indirect implications of water temperature within shoreline reaches above the Snoqualmie Falls, the shorelines within the City also support resident fish populations, including cutthroat trout, rainbow trout, eastern brook trout, mountain whitefish, largescale sucker, longnose dace, shorthead sculpin, mottled sculpin, western brook lamprey, threespine stickleback. (WDFW 2008).

In August to September when flows are low, temperatures increase. High temperatures in combination with low flows can negatively affect salmonid migration, spawning and rearing. High temperatures can be lethal and increase susceptibility to pathogens (Ecology 2011a). Riparian vegetation including shade from vegetation plays a key role in preventing an increase of instream temperatures. The established TMDL for the Snoqualmie River includes five strategies for improving stream temperatures:

- Restore riparian shading and the supply of large wood

[1]This section was added during a focused update to this Shoreline Inventory and Characterization Report in February 2019.

- Control erosion and sedimentation
- Reduce surface water use during late-summer, lowflow conditions
- Maintain/increase cool groundwater inputs during summer months
- Limit thermal loading point sources

The established TMDL identifies areas of 'shade defecit' along the Snoqualmie River, which measures the potential shade that would be provide by mature riparian forest versus the current condition as of 2011 (see Figure 55 in Ecology, 2011a). As detailed in the temperature TMDL Report, the large majority of shade deficit area occurs below the Snoqualmie Falls. As stated in the Report, "[i]n most cases below Snoqualmie Falls [all the way to the convergence with the Skykomish], there are no trees along the river at all." This is not the case for the majority of Snoqualmie River segments through the City, as detailed in Chapter 4.

Since establishment of the 2011 temperature TMDL, additional studies have been conducted regarding water temperature particularly downstream of the City of Snoqualmie, of note are: Hot Water and Low Flow: The Summer of 2015 in the Snoqualmie River Watershed (King County 2016), 2016 Snoqualmie River Water Temperature Study: Results and Findings (King County 2017); and Spatial and Temporal Variation of Water Temperature Regimes on the Snoqualmie River Network (Steel et al., 2016). See also, Kimball *Creek Water Quality Improvement Project Habitat and Water Quality Study and Report* (Snoqualmie Tribe and King Conservation District 2011). These documents provide ongoing assessment of water quality conditions, with focus on Snoqualmie River water temperature during summer low flow periods as well as the water quality benefits associated with restoration actions. These studies are generally consistent with the key strategies for improving stream temperatures within the 2011 Snoqualmie River Basin Temperature TMDL.

Over the last five years, the City has prioritized property acquisitions within Segment 6 of the Snoqualmie River (along Park Street). These acquisitions will provide opportunity for riparian restoration along this segment, and are being completed as part of the City's Riverwalk trail and park project. Restoration within Segement 6 will implement priority restoration opportunities and eventually achieve a riparian buffer of 150-200 feet in width, depending on location. Additional river shading provided by these efforts will be consistent with key strategies in the 2011 temperature TMDL.

3.4 WASTEWATER AND STORMWATER UTILITIES

Two primary utilities have the ability to significantly impact (directly and indirectly) jurisdictional shorelines: wastewater and stormwater. The City of Snoqualmie provides water service to its residents. The City also operates and maintains the City's stormwater collection system and facilities, as well as wastewater conveyance and treatment. Information about existing and proposed wastewater facilities was drawn from the City's General Sewer Plan (Gray & Osborne/ 2012). The City is currently updating both its General Sewer Plan and its Stormwater Plan. Information about existing and proposed surface water facilities was drawn from the City's Stormwater Comprehensive Plan (TetraTech 20105, adopted via Resolution No. 1287 on February 23, 2015), however, it does

not include the UGA. Additional utility information is described in greater detail for the shoreline in Section 4 and illustrated in Figures 5 and 6 in Appendix C.

3.4.1 Wastewater Utilities

In 2012, when the City's General Sewer Plan was written, approximately 4,764 acres and a population of 11,039 in the City (the entire incorporated City area) were served by sewer, via 3,743 sewer connections.. It is anticipated that an additional population of 4,421 people will be served by sewer by 2032. Additionally, it was noted in the Plan that approximately 34 houses in the City limits and several hundred houses in the City's UGA were served by on-site septic systems. It is assumed that failing or degraded septic systems along Kimball Creek are contributing to high fecal coliform levels in Kimball Creek. The City's wastewater treatment plant discharges treated effluent into the Snoqualmie River. The City has a National Pollutant Discharge Elimination System (NPDES) permit for Waste Discharge and Reclaimed Water (Permit No. WA-002240-3) at the City's Wastewater Treatment and Water Reclamation Facility. While the wastewater treatment plant is located outside of the 100-year floodplain, periodic flooding of the service area can impact sewage flows at the treatment plant. Because the Snoqualmie River has not always met water quality standards, water quality monitoring has been required in the Snoqualmie River in association with a Total Maximum Daily Load (TMDL) Plan (developed by Ecology in 1994a) for dissolved oxygen, pH, fecal coliform, and degradation of aesthetic values because of nutrient enrichment, in the river and its tributaries. In 2008, Ecology produced a document titled *Snoqualmie River Basin Fecal Coliform Bacteria, Dissolved Oxygen, Ammonia-Nitrogen, and pH Total Maximum Daily Load: Water Quality Effectiveness Monitoring Report.* In addition to the Snoqualmie River, the report also includes water quality sampling and analysis for the South Fork Snoqualmie River and Kimball Creek. Conclusions from the report are outlined below.

- Mainstem Snoqualmie River Mile (RM) 42.3: this sampling location is at the Meadowbrook Bridge. The report concluded that water quality is good at this site and recommends that local authorities should carefully manage stormwater for future growth and/or land use changes.
- Kimball Creek Watershed: Snoqualmie RM 41.1: Fecal coliform levels do not meet water quality standards, water temperatures are high, and the cause of low dissolved oxygen levels should be investigated.
- Mainstem Snoqualmie RM 40.7 (SR 202 crossing at Falls): The mainstem Snoqualmie River had good water quality for the parameters measured, including fecal coliform, temperature, dissolved oxygen, and pH.

3.4.2 Stormwater Utilities

The City of Snoqualmie adtoped its Stormwater Comprehensive Plan on February 23, 2015 (TetraTech 2010) for public review and comment. The document includes maps of its storm drain structures, storm pipe locations, and outfalls to water bodies. The new Stormwater Comprehensive Plan does not include the UGA. Figure 6 in Appendix C shows the location of storm drain pipes, catch basins, and ditches in and around the shoreline jurisdiction area.

The City is covered under the NPDES Phase II Western Washington Municipal Stormwater Permit (Ecology 2019c). The NPDES permit outlines actions Snoqualmie must take to minimize stormwater pollutants, including controlling stormwater run-off from construction sites, implementing a program of illicit discharge detection and elimination, standards and programs for operations and maintenance of stormwater facilities after construction, and public involvement and participation (City of Snoqualmie Stormwater Division, 2019). Permit compliance also requires that the City submit an annual report in March of every year, summarizing the City's stormwater program activities completed over the previous year. All development activities must also be compliant with Chapter 15.18 SMC (Surface and Stormwater Management) and Chapter 15.20 SMC (Clearing and Grading), relying on the 2016 King County Surface Water Design Manual as the primary guidance document for stormwater design.

3.5 IMPERVIOUS SURFACES

Impervious surface is a surface which either prevents or retards the entry of water into the soil mantle compared to natural conditions prior to development; and/or a surface which causes water to run off the surface in greater quantities or at an increased rate of flow compared to the flow present under natural conditions prior to development. Common impervious surfaces include, but are not limited to, roof tops, walkways, patios, driveways, parking lots or storage areas, concrete or asphalt paving, gravel roads, packed earth (e.g. lawns, heavily grazed pasture, athletic fields, etc.), and oiled, macadam, or other surfaces which similarly impede the natural infiltration of surface and storm water runoff (King County Stormwater Manual Glossary).

In addition to changes in impervious surfaces located directly within the shoreline area, increases in impervious surface throughout the contributing basin has the potential to impact the City's jurisdictional shorelines and other water bodies. There is substantial documentation on the effects and implication of increase imperviousness on natural aquatic systems. Increases in impervious surface can cause greater quantities of water to be directed towards natural conveyances and receiving bodies (e.g., lakes, streams, and wetlands), flooding, as well as an increased water velocity in streams. Increases in water volume may change the hydroperiod of natural water bodies: meaning that storm events may cause lakes/wetlands to have greater water level fluctuations for a given storm event. Increased water velocity can cause an increase in erosion, sediment deposition, and movement of pollutants associated with stormwater and sediment. Flooding can cause damage to human infrastructure and public/private properties, as well as the deposition of sediment and debris within the floodplain. Storm water carries pollutants and sediment which can eventually reach water bodies such as the Snoqualmie River, South Fork Snoqualmie River, and Kimball Creek. When the water velocity slows, the pollutants and sediment drop out of the water column and settle in the water. Increased sedimentation adversely affects water quality which in turn, may impair habitat for aquatic organisms as well as physically change the configuration of the lakeshore causing loss or change in shoreline habitats.

The readily available public data was insufficient to calculate the amount of impervious surface within the shoreline jurisdiction. Twenty percent imperviousness has been identified by King County as the threshold, above which, adverse changes in hydroperiod should be expected. Even

parcels that are developed but have no structures, such as the golf course, have areas of impervious surface in the form of parking lots, access roads, and compacted lawn.

3.6 SHORELINE MODIFICATIONS

Shoreline modifications are alterations to natural lake shores, stream and river banks, and nearshore environments, and may include features such as levees, dikes, bridges, road embankments, utility crossings, bulkheads, docks or piers, a variety of armoring types (some associated with fill), and other in-water structures such as boatlifts, boathouses, and moorage covers. These types of modifications alter the functions of lake and stream channel edges; change erosion, sediment movement, and channel migration patterns; affect the distribution of aquatic vegetation; alter flow dynamics; impact floodplain processes; and are often accompanied by upland vegetation loss. Information about shoreline modifications was derived from aerial photographs and brief site visits.

The majority of known shoreline modifications occur along the Snoqualmie River. There is very little modification along the South Fork Snoqualmie River and Kimball Creek. Modifications along the Snoqualmie River include the installation of engineered log jams (ELJs), three bridge crossings (two car and one railroad, the latter of which only the abutments remain), and installation of boulders (rip rap) for armoring. Between the SR 202 bridge that crosses the Snoqualmie River and downstream to Snoqualmie Falls there is extensive armoring on both banks that includes boulders and retaining walls. These shoreline structures protect the buildings along the shore that are used for Puget Sound Energy's hydroelectric power production facility at the Falls. Armoring along Kimball Creek includes the road (SR 202) and railroad crossing. It does not appear that there is armoring or other types of shoreline modification along the South Fork Snoqualmie River within the City's shoreline jurisdiction (see Figure 7, Appendix C).

In September 2000, an extensive bank stabilization project was constructed by King County on the left bank of the Snoqualmie River, just downstream from the Meadowbrook Bridge. ELJs and bio-engineered bank stabilization methods were installed to help protect the bank from further erosion, protect residents from flooding, and provide habitat features. The installation is located along 500 feet of river bank and used 300 pieces of large wood debris (LWD). The ELJs are used to project flows towards the middle of the stream to avoid bank erosion. The bio-engineered bank stabilization methods were employed to stabilize the native soils and to root new vegetation along the shoreline, further providing bank stabilization.

3.7 EXISTING AND POTENTIAL PUBLIC ACCESS SITES

The City of Snoqualmie, including Puget Sound Energy, have created parks, recreation and open space facilities within the City, which provide the public both physical and visual access to areas within the shoreline jurisdiction. The public access sites were defined and identified from 2009 aerial photographs and a field reconnaissance of the study area in January 2010 and August 2011. Providing public access to the shoreline area is important not only to the City but to citizens of Snoqualmie. The City performed a number of strategic planning efforts over the last several years, including the Downtown Vision Plan, the Economic Development Plan and the Downtown Master

Plan. All of these plans strongly recommend the future development of a riverwalk trail along the Snoqualmie River shoreline. The majority of the riverfront property within Snoqualmie's shoreline jurisdiction is zoned open space. The riverfront properties on the right bank (north side) of the Snoqualmie River are vacant and privately owned. Riverfront properties on the left bank (south side) of the Snoqualmie River include a number of city-owned parcels, along with properties currently occupied as single-family residential uses or vacant and developed commercial properties within the historic downtown area. If the opportunity presents itself, the City should consider property acquisitions of riverfront properties to provide public access along the shoreline.

Due to the dangers presented by the river, the majority of public access to the river is in the form of viewing versus physical access. There are informal trails down steep embankments that lead to the water's edge. During times of low summer flows residents use these areas as swimming holes. Snoqualmie Falls, large boulders and wood, and the power of a flowing river present extreme dangers to the public. For these same reasons, the portion of the river within the City is not used for boating activities.

The amount of area zoned and designated park/open space within the City's shoreline jurisdiction is one measure of the existing public access opportunity. Existing and potential physical and visual access points are shown on Figure 8 in Appendix C.

3.8 CRITICAL AREAS

The inventory of critical areas was based on a wide range of information sources. A complete listing of citations used to compile information on critical areas is included in Section 8.0. The primary source for GIS data relating to critical areas was from King County. Critical areas mapping and identification includes geologically hazardous areas, channel migration zones, streams, wetlands, fish and wildlife habitat conservation areas, and critical aquifer recharge areas. This information was supplemented with maps or reports obtained from WDFW, Washington Department of Natural Resources (DNR), and Ecology. Soils mapped by the Natural Resource Conservation Service (NRCS) are shown on Figure 14 in Appendix C.

Critical areas are described as they relate to the project segments in Section 4 and shown in Figures 9-14 in Appendix C.

3.8.1 Geologically Hazardous Areas

The City of Snoqualmie's regulations address four types of hazards: erosion, landslide, steep slope, and seismic. They are defined in the City's Sensitive Areas Ordinance 19.12 as follows:

> Erosion Hazard Areas: "*Means those areas of the city containing soils which, according to the USDA Soil Conservation Service, King County Soils Survey, dated 1973, and any subsequent revisions or additions thereto, and the USDA Soil Conservation Service, Soils Survey for Snoqualmie Pass Area, Parts of King and Pierce Counties, WA, dated December 1992, may experience severe to very severe erosion hazard, and which occur on slopes of 15 percent or greater. This group of soils includes: Alderwood Gravelly Sandy Loam (AgD), Alderwood-Kitsap (AkF), Beausite Gravelly Sandy Loam (BeD and BeF), Kitsap Silt Loam (KpD), Ovall*

Gravelly Sandy Loam (OvD and OvF), Ragnar Fine Sandy Loam (RaD), Ragnar-Indianola Association (RdE), Riverwash (Rh), or Coastal Beaches (Cb), and any soil type that could be subject to erosion when disturbed."

Landslide Hazard Areas: "*Means those areas of the city subject to a risk of landslide, including the following areas:*

1. *Any area with slopes greater than 15 percent and impermeable soils (typically silt and clay) frequently interbedded with granular soils (predominantly sand and gravel) and springs or groundwater seepage;*
2. *Any area which includes areas with significant visible evidence of groundwater seepage, and which also includes existing landslide deposits regardless of slope;*
3. *Any area which has shown movement during the Holocene epoch (from 10,000 years ago to present) or which is underlain by mass wastage debris of that epoch as determined by a geologist;*
4. *Any area potentially unstable as a result of rapid stream incision or stream bank erosion;*
5. *Any area located on an alluvial fan, presently or potentially subject to inundation by debris flow or deposition of stream-transported sediments."*

Steep Slope Areas: *"Means those areas of the city where the ground rises at an inclination of 40 percent or more within a vertical elevation change of at least 10 feet (a vertical rise of 10 feet or more for every 25 feet of horizontal distance). A slope is delineated by establishing its toe and top and measured by averaging the inclination over at least 10 feet of vertical distance."*

Seismic Hazard Areas: *"Means those areas of the city subject to severe risk of earthquake damage as a result of seismically induced landslides, earth adjustments, settlement or soil liquefaction."*

The City has mapped erosion, landslide, steep slope, and seismic hazard areas based on King County (iMAP) GIS data. The entire historic downtown area within the shoreline jurisdiction is mapped as a high seismic hazard area. There are several erosion hazard areas mapped within the shoreline jurisdiction, however, it is not as extensive as the mapped seismic area. There is a small amount of mapped landslide hazard areas within the City; however, they are not mapped within the shoreline jurisdiction. Geologically hazardous areas for the shoreline jurisdiction are discussed further in Section 4 and shown in Figure 9 in Appendix C.

3.8.2 Wetlands

City, King County, National Wetlands Inventory (NWI), and WDFW Priority Habitats and Species (2007) wetland mapping show that there are extensive wetlands located in the shoreline jurisdiction area (see Figure 10 in Appendix C). Wetlands within city limits are regulated by the City of Snoqualmie under the Sensitive Areas Ordinance, Chapter 19.12.180. The wetland boundaries shown in Figure 10 are approximate as they were not formally delineated for this project. Additional wetlands may be found when development occurs on currently undeveloped properties. Soils mapped in and around the shoreline area are shown in Figure 14 in Appendix C (NRCS 2009). Soil types classified as "hydric" may be indicative of wetlands.

The majority of the wetlands located in the shoreline jurisdiction are located south and southeast of the City's historic downtown area. There are several wetland types including palustrine forested, scrub-shrub, and emergent. Many of the wetlands are located in former oxbows of the Snoqualmie River. Many of the areas have been managed for agriculture and now are managed mainly for recreation and to provide flood storage.

3.8.3 Streams

Information regarding streams was gathered from the WDFW Priority Habitats and Species maps and reports (WDFW 2007), and other resources. Streams are regulated by the City of Snoqualmie under the Sensitive Areas Ordinance, Chapters 19.12.170 and 19.12.190. There are three rivers/streams within the City of Snoqualmie that are under the shoreline jurisdiction. Streams and rivers within the shoreline jurisdiction are shown in Figure 10 in Appendix C.

The three streams under shoreline jurisdiction for the City of Snoqualmie are the Snoqualmie River, South Fork Snoqualmie River, and Kimball Creek. All three are categorized by DNR as Type S streams (DNR/FPARS 2010). Type S streams are defined by DNR Forest Practices are designated as "shorelines of the state" as defined in Chapter 90.58 RCW. Other streams located within the City are not considered under shoreline jurisdiction because they do not meet the requirements of having a mean annual flow of 20 cfs or greater.

3.8.4 Other Fish and Wildlife Habitat Conservation Areas

Fish and Wildlife Habitat

Per SMC 19.12.190, Fish and Wildlife Habitat Conservation Areas are defined as: *"All wetlands and streams and their buffers, together with all publicly owned open spaces of greater than 10 acres, not including land use perimeter buffers, are hereby designated as fish and wildlife habitat conservation areas, including Meadowbrook Farm, the Two Sisters Return Open Space, Snoqualmie Point, Three Forks Natural Area, the Snoqualmie River Open Space and the Kimball Creek Open Space. Other areas shall be designated as fish and wildlife habitat conservation areas based upon a habitat study conducted pursuant to this section."*

Additionally, habitat studies are required by the City for all development proposals which the director determines may affect the habitat of a listed species (Federal or State). Priority Habitat and Species maps are included in Figure 13 in Appendix C.

3.8.5 Critical Aquifer Recharge Areas

King County has not mapped critical aquifer recharge areas within the city limits. Therefore, this is a gap of existing information for the City. However, there is mapping available for the UGA areas available from the County's iMap interactive map site. The majority of the surrounding UGA areas are considered Critical Aquifer Recharge Areas. The City's sensitive areas ordinance (19.12.200) provides regulations for critical aquifer recharge areas, categorized as follows:

1. *"Category I critical aquifer recharge areas include those areas mapped by King County and are determined as highly susceptible to groundwater contamination and that are located within a sole source aquifer or a wellhead protection area.*
2. *Category II critical aquifer recharge areas include those areas mapped by King County and determined:*
    a. *Have medium susceptibility to groundwater contamination and are located in a sole source aquifer or a wellhead protection area; or*
    b. *Are highly susceptible to groundwater contamination and are not located in a sole source aquifer or wellhead protection area.*

3.9 FLOODPLAIN AND CHANNEL MIGRATION ZONE

3.9.1 Floodplain

Floodplains are "synonymous with the one hundred-year flood plain and means that land area susceptible to inundation with a one percent chance of being equaled or exceeded in any given year. The limit of this area shall be based upon flood ordinance regulation maps or a reasonable method which meets the objectives of the act" (WAC 173-26-020). The City has mapped the floodplains via data from the Federal Emergency Management Agency (FEMA). The City of Snoqualmie has extensively mapped floodplain areas within its City limits and UGA areas (Figure 1, Appendix C).

3.9.2 Channel Migration Zone

According to definitions in Ecology's Shoreline Master Program Guidelines (WAC 173-26-020), "'Channel migration zone (CMZ)' means the area along a river within which the channel(s) can be reasonably predicted to migrate over time as a result of natural and normally occurring hydrological and related processes when considered with the characteristics of the river and its surroundings."

According to 19.12.020(F) of the SMC, "Channel migration zones" are "delineated on the Snoqualmie River Channel Migration Area Map, contained in "Channel Migration in the Three Forks Area of the Snoqualmie River" (King County Department of Natural Resources, Surface Water Management Division, Seattle, WA, 1996), which is hereby incorporated by this reference." The map presents three levels of channel migration that may occur and is based on the likeliness that it will occur in certain areas. The three levels are potential, moderate, and severe channel migration zones. This map is presented in Figure 12 in Appendix C and the possible effect of channel migration on each segment is presented in Section 4.

3.10 HISTORICAL OR ARCHAEOLOGICAL SITES

The Washington State Office of Archaeology and Historic Preservation (OAHP) WISAARD website was searched to identify known historical or archaeological features. OAHP has record of several historic sites or structures in Snoqualmie's shoreline jurisdiction. The largest are associated with Snoqualmie Falls and the hydroelectric power plant. The entire property is listed as the Snoqualmie Falls Hydroelectric Power Plant Historic District and a grouping of the structures on the site were built between 1898 and 1900. The second group of structures was built in 1910. The

historic district is located on both sides of the Snoqualmie River, just upstream from Snoqualmie Falls.

The Snoqualmie Falls also have religious and cultural significance for the Snoqualmie Indian Tribe. The Snoqualmie Falls (including the Falls themselves, the rock walls surrounding them, and the plunge pool) are also designated under the National Historic Preservation Act ("NHPA") as a traditional cultural property ("TCP"), and the Snoqualmie Falls TCP is listed on the National Register of Historic Places.

Another structure in the shoreline area is the Snoqualmie Depot located on East King Street; it was constructed in 1889-1890. The Snoqualmie School Campus located at the intersection of King and Silva Streets is also located in the shoreline jurisdiction. The buildings were constructed between 1911 and 1920. The final property listed within the shoreline jurisdiction is the "Messenger of Peace" Chapel Car. The wooden rail car is located at 38625 SE King Street and was built in the late 1800s, with use during the early to mid- 1900s. The rail car is located at the Northwest Railway Museum.

Significant areas within Snoqualmie's shoreline area have been previously graded or excavated. This does not preclude the possibility of finding artifacts and the Shoreline Master Program should provide clear direction regarding circumstances when a special study may be necessary, and what action to undertake in the event of an unexpected discovery.

3.11 OTHER AREAS OF SPECIAL INTEREST

Areas of special interest not included in the other elements of the inventory, such as rapidly developing waterfronts, eroding shorelines, or other degraded sites with potential for ecological restoration were identified based on the references described above, through aerial photos, and other information gathering.

3.11.1 Water-Oriented Uses

According to Ecology's SMP Guidelines (173-26-020 WAC), "water-oriented use means a use that is water-dependent, water-related, or water-enjoyment, or a combination of such uses." The rivers and streams provide passive recreation for viewing the water. Boat-related uses on the Snoqualmie River are limited due to the extreme danger of the nearby Snoqualmie Falls.

3.11.2 Toxic or Hazardous Waste Sites

Ecology's *Hazardous Sites List* (dated August 31, 2011) does not have any sites listed in the City of Snoqualmie or the UGA.

According to the U.S. Environmental Protection Agency's (EPA) Envirofacts Data Warehouse website, nine sites in Snoqualmie's shoreline jurisdiction are listed as being regulated by EPA. The regulated sites within the City's shoreline jurisdiction (including the UGA) are listed below.

Table 3.3 EPA Regulated Facilities in the City of Snoqualmie Shoreline Jurisdiction

Business Name	Address	Shoreline Segment	Permit Types with EPA
Shultz Distributing	9120 Boalch Ave SE	8	Hazardous Waste Water Quality Toxics
Alpine Coachworks	8352 Meadowbrook Way	7A	Hazardous Waste
Mt. Si High School	8651 Meadowbrook Way SE	7A	Hazardous Waste
Snoqualmie Rail Yard	7500 SR 202	7A	Hazardous Waste Toxics
Snoqualmie City Maintenance Shop	7970 Railroad Ave SE	7A	Toxics
Snoqualmie Valley School District Bus Garage	800 Silva Ave SE	7A	Hazardous Waste
Snoqualmie WWTP	38210 SE Mill Pond Loop	3	Water Quality
Snoqualmie Falls	Bottom of Falls	1 and 2	Resource Conservation
Weyerhaeuser Snoqualmie Mill	7001 396th Ave SE (UGA)	12	Air Quality Water Quality Hazardous Waste

3.12 OPPORTUNITY AREAS

Ecology's *Shoreline Master Program Guidelines* (173-26 WAC) includes the following definition:

> "Restore," "Restoration" or "ecological restoration" means the reestablishment or upgrading of impaired ecological shoreline processes or functions. This may be accomplished through measures including but not limited to re-vegetation, removal of intrusive shoreline structures and removal or treatment of toxic materials. Restoration does not imply a requirement for returning the shoreline area to aboriginal or pre-European settlement conditions.

Consistent with Ecology's definition, use of the word "restore," or any variations, in this document is not intended to encompass actions that re-establish historic conditions. Instead, it encompasses a range of actions that can be approximately delineated into three categories: creation (of a new resource), restoration (of a converted or substantially degraded resource), and enhancement (of an existing degraded resource). The City can encourage applicants to implement restoration actions that will improve ecological functions relative to the applicant's pre-project condition. As stated in WAC 173-26-201(2)(c):

> It is intended that local government, through the master program, along with other regulatory and nonregulatory programs, contribute to restoration by planning for and fostering restoration and that such restoration occur through a combination of public and private programs and actions. Local government should identify restoration opportunities through the shoreline inventory process and authorize, coordinate and facilitate appropriate

> publicly and privately initiated restoration projects within their master programs. The goal of this effort is master programs which include planning elements that, when implemented, serve to improve the overall condition of habitat and resources within the shoreline area of each city and county."

The Opportunity Areas discussions in Section 4 present options for "restoration" that would improve ecological functions.

A Restoration Plan document will be prepared as a later phase of the Shoreline Master Program update process, consistent with WAC 173-26-201(2)(f). The Restoration Plan will "include goals, policies and actions for restoration of impaired shoreline ecological functions. These master program provisions should be designed to achieve overall improvements in shoreline ecological functions over time, when compared to the status upon adoption of the master program."

Restoration opportunities for each of the shoreline segments are further discussed in Section 4. Many of the restoration opportunities are similar for each of the segments and include:

- Use the Meadowbrook Farm Master Plan and the Three Forks Natural Area Master Plan as guidance for the placement and types of restoration that have already been identified.
- Segment 6 (along the south bank of the Snoqualmie River) is an area identified for restoration. Publicly-owned parcels should be evaluated for the presence of non-native invasive species as well as how the parcel was previously used. The parcels should be appropriately cleaned up by removing septic or oil tanks (if present), as well as removing garbage or other items that could end up in the river during flood events.
- Replacement of non-native invasive plants with appropriate native species.
- Educational opportunities for residents include topics such as the use of fertilizers and pesticides, the installation of native plant species, and the use LID and green building techniques.
- The use of LID and green building techniques for the redevelopment of the City parks in shoreline jurisdiction.
- In areas of natural or semi-natural shoreline condition, education regarding the preservation and maintenance of these features is highly encouraged.
- Cleanup of hazardous and toxic waste at the former Weyerhaeuser Mill site.

4.0 CONDITIONS BY INVENTORY SEGMENT IN SNOQUALMIE

To categorize distinct shoreline segments in Snoqualmie, the shoreline jurisdiction was classified into twelve segments (1 through 12) (see Figure 4 in Appendix C) based broadly on the level of ecological functions provided by each segment, as well as existing land uses and zoning, as directed in the guidance from Ecology. Recommendations for potential future environmental designations are provided in Section 6.

For each shoreline planning segment, a summary discussion is followed by a discussion of specific elements of the shoreline inventory for those elements that are not covered in sufficient detail in Section 3 above.

4.1 SEGMENT 1

Segment 1 of the Snoqualmie River encompasses the left bank starting from the northern city limits (RM 39.8) to the bottom of the falls (RM 40.3) Segment 1 is 13 acres.

4.1.1 Land Use and Public Access

Existing Land Use

The majority of the land within Segment 1 is undeveloped riparian forest. The Comprehensive Plan map indicates the future land use for this Segment as parks/open space and utility park. Segment 1 is designated Natural shoreline environment by the currently adopted SMP.

Public Access

The Northwest Railway Museum operates the Snoqualmie Valley Railroad, a five mile public carrier railroad that travels between Snoqualmie and North Bend. The train stops in Segment 1 to allow for public access viewing of the Snoqualmie Falls. The potential to provide physical access to the shoreline in Segment 1 is impossible due to the 270-foot high cliffs.

4.1.2 Critical Areas

Segment 1 is associated with the riparian buffer of the Snoqualmie River, and is considered a Fish and Wildlife Conservation Area. There are no known wetlands in this segment. The Snoqualmie River is designated priority habitat by WDFW for Snohomish Coastal Cutthroat.

Additionally, all of Segment 1 is considered an erosion hazard area (Figure 9, Appendix C).

4.1.3 Opportunity Areas

The greatest opportunity for this segment is to protect its natural condition. This segment can be viewed from the right bank of the Snoqualmie River (Segment 2), and provides valuable forested habitat with little possibility of human intrusion due to the steep slopes and lack of access.

4.2 SEGMENT 2

Segment 2 of the Snoqualmie River includes the right bank starting from the northern city limits (RM 39.9) to a point approximately 550 feet upstream of the SR 202 bridge (RM 40.7). Segment 2 also includes the left bank of the Snoqualmie River from the bottom of Snoqualmie Falls (RM 40.3) to the SR 202 bridge (RM 40.6) The entirety of Segment 2 is approximately 31 acres.

4.2.1 Land Use and Public Access

Existing Land Use

Segment 2 consists of utility facilities, park land and businesses. The majority of the land within Segment 2 is owned by Puget Sound Energy who operates and maintains the hydroelectric facilities located around Snoqualmie Falls. Facilities include a dam, two power generating plants with associated intakes, flowlines, powerhouses, and other ancillary facilities, including a highly used recreation park (FERC EIS, 1996). The Snoqualmie Falls Park includes approximately two acres of property owned by Puget Sound Energy. Located immediately above the Snoqualmie Falls is the Salish Lodge and Spa. The Comprehensive Plan map indicates the future land use for this segment as utility park, business/retail, parks/open space and residential. The existing shoreline environment designations for this area are Conservancy and Natural Shoreline Environment.

Public Access

Existing visual public access sites within Segment 2 can be found on the right bank below the falls near the lower powerhouse owned by Puget Sound Energy and above the falls on the south side of the SR 202 bridge. Immediately outside Segment 2 on the right bank of the river, the two-acre Snoqualmie Falls Park includes a trail that leads visitors from the upper Snoqualmie Falls observation deck down to below the falls for viewing at the lower Snoqualmie Falls observation deck .

4.2.2 Transportation

The SR 202 bridge crosses the Snoqualmie River between the left and right bank of Segment 2. The Snoqualmie Valley railroad travels through this segment on the left bank. A parking lot is located in this segment for the Snoqualmie Falls Park and Salish Lodge visitors.

The City's *2010-2015 Capital Facilities Plan* lists two improvement projects partially within the right bank of Segment 2. One project involves the construction of a 150-foot four-way roundabout ("the Tokul Road Roundabout") planned for the intersection of SR 202, Tokul Road and Mill Pond Road. The Tokul Road Roundabout was completed in 2017. The other project improvements include lane widening along SR 202 from the Snoqualmie Parkway to the northern city limits and the replacement of the SR 202 bridge to include the addition of a bike path and sidewalk improvements crossing the Snoqualmie River.

4.2.3 Wastewater and Stormwater Utilities

There is a data gap regarding how stormwater and wastewater is treated and routed within Segment 2.

4.2.4 Shoreline Modifications

Segment 2 has significant shoreline modifications in some areas. Most prominent are the right and left bank just upstream of the falls where shoreline armoring is comprised of boulders and cement walls to protect the shoreline from erosion. On the shoreline in this part of the segment are buildings, parking areas, and other equipment related to the hydroelectric power plant that is operated at the falls. Crossing the river immediately upstream is a dam that regulates flow related to the power production. The other significant shoreline modification in this segment is the SR 202 bridge, which is a two-lane trestle bridge with the abutments located in the water, near the shoreline.

4.2.5 Critical Areas

The majority of critical areas in Segment 2 are the Snoqualmie River and its associated riparian buffer. Other critical areas include geologically hazardous areas around the falls that are at risk for erosion. There are several mapped wetlands on the right bank of the Snoqualmie River downstream from the falls. The wetlands are mapped as palustrine emergent and palustrine scrub-shrub. The Snoqualmie River is designated priority habitat by WDFW for resident Snohomish Coastal Cutthroat and rainbow trout.

4.2.6 Floodplain and Channel Migration Zone

Segment 2 is not located in the floodplain of the Snoqualmie River.

A small portion of Segment 2 is located in the channel migration zone of the Snoqualmie River. The portion of Segment 2 located in the CMZ is on the right bank of the river, for approximately 550 feet upstream of the SR 202 bridge.

4.2.7 Historical or Archaeological Sites

The largest historical sites in the City of Snoqualmie are associated with Snoqualmie Falls and the hydroelectric power plant. The entire property is listed as the Snoqualmie Falls Hydroelectric Power Plant Historic District and a grouping of the structures on the site were built between 1898 and 1900. The second group of structures was built in 1910. The historic district is located on both sides of the Snoqualmie River, just upstream from Snoqualmie Falls. The Snoqualmie Falls also have religious and cultural significance for the Snoqualmie Indian Tribe. The Snoqualmie Falls (including the Falls themselves, the rock walls surrounding them, and the plunge pool) are also designated under the National Historic Preservation Act ("NHPA") as a traditional cultural property ("TCP"), and the Snoqualmie Falls TCP is listed on the National Register of Historic Places.

4.2.8 Opportunity Areas

It is unlikely that armoring near the power plant or the dam can be removed unless the power plant project is completely discontinued. There is opportunity to remove bridge abutments and relocate them outside of the ordinary high water mark and remove armoring when the SR 202 bridge is rebuilt. If armoring is needed along the shoreline to protect the bridge, natural armoring practices should be used that include native vegetation and large woody debris, both of which will also provide habitat features. There is opportunity for removal of non-native invasive plant species in the shoreline area and replanting with native species.

4.3 SEGMENT 3

Segment 3 is the area west of the City of Snoqualmie wastewater treatment plant between RM 40.5 and 40.8. The entirety of Segment 3 is approximately 18.2 acres.

4.3.1 Land Use and Public Access

The majority of the land exists as undeveloped riparian forest within Segment 3. The Comprehensive Plan map indicates the future land use for this segment as utility park. The existing shoreline environment designation for this area is Urban Floodplain Shoreline Environment. There is no public access opportunity.

4.3.2 Wastewater and Stormwater Utilities

There are no structures or development in this area that require wastewater or stormwater utilities.

4.3.3 Critical Areas

A portion of Segment 3 is mapped as wetland (USFWS 2010). The wetland is separated into two classifications: palustrine forested and palustrine scrub-shrub both of which are seasonally flooded.

4.3.4 Floodplain and Channel Migration Zone

Segment 3 is located in the floodplain of the Snoqualmie River. A very small portion of the southern section of Segment 3 has a potential risk for channel migration. The northern portion, where the majority of Segment 3 is located, is not mapped for channel migration.

4.3.5 Opportunity Areas

The best opportunity for the wetland area is to protect it in its current natural condition, particularly because the area is seasonally flooded.

4.4 SEGMENT 4

Segment 4 covers 8.7 acres of land west of SR 202 beginning at the SR 202 bridge to a point approximately 2,640 feet south of the Snoqualmie Parkway/SR 202 intersection. The entirety of Segment 4 is approximately 8.7 acres.

4.4.1 Land Use and Public Access

Existing Land Use

Land use in Segment 4 is primarily comprised of vacant/open space land. The property located south of the Snoqualmie Parkway is publicly owned and utilized as a Christmas tree lot in the winter months. The Comprehensive Plan map indicates the future land use for this segment as parks/open space and utility park. The existing shoreline environment designation for this area is Urban Floodplain Shoreline Environment.

Public Access

The publicly owned area south of the Snoqualmie Parkway is located immediately adjacent to Kimball Creek. The potential to provide access includes development of the publicly owned property abutting Kimball Creek.

4.4.2 Transportation

The Snoqualmie Parkway and SR 202 intersection is located within Segment 4.

The City's *2010-2015 Capital Facilities Plan* lists one project where a small portion of the improvements are located within Segment 4. The project involves improvements to lane width and path/sidewalks along SR 202 from SE Northern Street to the Snoqualmie Parkway.

4.4.3 Wastewater and Stormwater Utilities

There is no development in this Segment, and therefore no need for wastewater treatment. The City's force main for wastewater conveyance is located beneath the southern section of Segment 4.

4.4.4 Critical Areas

A small portion (southernmost section) of Segment 4 is located in the riparian buffer of Kimball Creek, a Fish and Wildlife Habitat Conservation Area.

4.4.5 Floodplain and Channel Migration Zone

Segment 4 is located in the floodplain of the Snoqualmie River. The southern portion of the segment may also receive floodwaters from Kimball Creek.

4.4.6 Opportunity Areas

The majority of this area is unvegetated and is often used for parking or as a Christmas tree lot. Other uses in this area could be the promotion of other roadside stands throughout the year, rather than just during the holiday season. This could include a farmers market, or other fruit/vegetable stands.

Areas closest to Kimball Creek and the forested riparian buffer should be evaluated for the presence of non-native invasive species. If they are present, this area should be considered for restoration as it is the gateway between the Snoqualmie Ridge development and the historic downtown.

4.5 SEGMENT 5

Segment 5 includes the left bank of the Snoqualmie River from south of the SR 202 bridge (RM 40.6) upstream to Northern Street (RM 41.5). Segment 5 also includes the right and left banks of Kimball Creek extending from its confluence with Coal Creek downstream to its mouth of the Snoqualmie River. The entirety of Segment 5 is approximately 71.50 acres.

4.5.1 Land Use and Public Access

Existing Land Use

Segment 5 consists of publicly owned forested open space. A small portion of Segment 5 includes city-owned property that houses a sewer lift station. The Comprehensive Plan map indicates the future land use for this segment as mixed use, residential, utility park and parks/open space. The existing shoreline environment designations for this area are Urban Floodplain and Conservancy Shoreline Environment.

Public Access

West of Segment 5 is the Kimball Creek Village retail/residential development. Per the Kimball Creek Village mixed use final plan for this development, the construction of a soft surface trail is required from the development to SR 202 within the Kimball Creek shoreline of this segment. On the north side of SR 202, a 600-foot pedestrian trail follows Kimball Creek to its confluence with the Snoqualmie River. Segment 5 also includes shoreline access to the Snoqualmie River via Sandy Cove Beach.

4.5.2 Transportation

The only major road that crosses Segment 5 is SR 202. The Snoqualmie Valley Railroad runs parallel to SR 202.

The City's *2010-2015 Capital Facilities Plan* lists one project where a portion of the improvements are located within Segment 5. The project involves improvements to lane width, bridge improvements and path/sidewalks along SR 202 from SE Northern Street to the Snoqualmie Parkway.

4.5.3 Wastewater and Stormwater Utilities

There is no development in this segment, and therefore no need for wastewater treatment. The City's force main for wastewater conveyance is located beneath Segment 5 in the right-of-way for SR 202.

The only stormwater conveyance needed in Segment 5 is for runoff from SR 202. It is unknown how or if stormwater runoff from the highway is treated or conveyed.

4.5.4 Shoreline Modifications

Shoreline modifications in Segment 5 include the south end of the SR 202 bridge that crosses the Snoqualmie River. Modifications to the shoreline to accommodate the bridge include rip rap and the

bridge abutments that are located within the ordinary high water mark of the river. Kimball Creek flows beneath the railroad tracks and SR 202, creating shoreline modifications to Kimball Creek that include bridge abutments for a bridge and train trestle, and rip rap for bank stabilization.

4.5.5 Critical Areas

Segment 5 encompasses a large forested area on the left bank of the Snoqualmie River as well as the large forested area on the left and right banks of Kimball Creek, all of which are considered Fish and Wildlife Habitat Conservation Areas. The southern lobe of Segment 5 that is adjacent to the Snoqualmie River is mapped as wetland and is broken into two classifications: palustrine unconsolidated bottom that is permanently flooded and palustrine forested that is temporarily flooded. The Snoqualmie River is designated priority habitat by WDFW for Snohomish Coastal Cutthroat.

4.5.6 Floodplain and Channel Migration Zone

All of Segment 5 is located in the floodplain of the Snoqualmie River and Kimball Creek.

Portions of Segment 5 located on the northeast side of SR 202 are in the channel migration zone of the Snoqualmie River.

4.5.7 Opportunity Areas

The majority of Segment 5 should be left in its natural condition in order to maintain or possibly improve water quality in Kimball Creek. The portion of Segment 5 that is adjacent to the Snoqualmie River may be part of the river walk trail project. No other structures can be built in this portion of Segment 5 because the area is located in the floodway of the river and is at high risk for channel migration.

4.6 SEGMENT 6

Segment 6 includes the left bank of the Snoqualmie River from Northern Street (RM 41.5) to a point approximately 375 feet upstream of the Meadowbrook Bridge (RM 42.3). The entirety of Segment 6 is approximately 22 acres.

4.6.1 Land Use and Public Access

Existing Land Use

Segment 6 is a mix of utility facilities, park land, single-family residences and open space. Sandy Cove Park, a five-acre park on the bank of the river, offers an open space area of maintained lawn. A 900-foot nature trail begins in the park and leads to a sandy beach at the river's edge. Riverview Park, a 1.75-acre park is located further upstream along the bank of the river, offers active and passive recreational facilities. Utility uses within Segment 6 include two City sewer lift stations. The majority of uses within this segment include single-family residential and public open space. The Comprehensive Plan map indicates the future land use for the entire segment to be primarily

parks/open space with some pockets of business/retail, residential and utility park uses. The existing shoreline environment designation for this area is Urban Riverfront Shoreline Environment.

Public Access

The existing visual public access points within Segment 6 include Sandy Cove Park and Riverview Park. Pockets of publicly-owned open space also provide visual access within this shoreline segment.

The potential to expand access to the shoreline in Segment 6 is limited at this time as the riverbank is developed mostly as private property. If the opportunity presents itself, the City should consider property acquisitions of riverfront properties to provide public access along the shoreline.

4.6.2 Transportation

The Meadowbrook Bridge crosses the Snoqualmie River near RM 42.3. Smaller roads provide access to the existing single-family residential homes located along the Snoqualmie River. There are no transportation improvement projects planned for Segment 6.

4.6.3 Wastewater and Stormwater Utilities

Sewer mains are located on the outskirts of Segment 6 and it is presumed that the homes located in this segment are served by the City's sewer system and do not have septic tanks.

There are five stormwater outfalls in Segment 6 that discharge into the Snoqualmie River (Figure 6 in Appendix C). Stormwater is routed through a closed-pipe conveyance system and discharged from the banks of the river.

4.6.3 Shoreline Modifications

In September 2000, an extensive bank stabilization project was constructed in Segment 6 on the left bank of the Snoqualmie River, just downstream from the Meadowbrook Bridge. This portion of the river is the outside bend which suffers severe erosion. Engineered log jams and bio-engineered bank stabilization methods were installed to help protect the bank from further erosion, protect residents from flooding, and provide habitat features. The installation is located along 500 feet of river bank, all of which is located in Segment 6, and used 300 pieces of large wood debris. The ELJs are used to project flows towards the middle of the stream to avoid bank erosion. The bio-engineered bank stabilization methods were employed to stabilize the native soils and to root new vegetation along the shoreline, further providing bank stabilization. The other shoreline modifications in Segment 6 are the bridge abutments for the Meadowbrook Bridge as well as some armoring to protect the abutments.

4.6.4 Critical Areas

Segment 6 is located on the left bank of the Snoqualmie River. The riparian buffer is included in the shoreline jurisdiction and is considered a Fish and Wildlife Habitat Conservation Area. There are no known wetlands in this segment. The Snoqualmie River is designated priority habitat by WDFW for resident Snohomish Coastal Cutthroat and rainbow trout.

4.6.5 Floodplain and Channel Migration Zone

Segment 6 is located in the floodway and is rated as a severe risk for channel migration. Previous storm events have already caused portions of this segment to be eroded. The installation of the ELJs mentioned above, were installed to help protect this shoreline from further erosion.

4.6.6 Opportunity Areas

The City has plans to build a river walk that leads from the southern end of Segment 5 and continues along the river's shoreline into Segment 6. Several of the parcels in Segment 6 are owned by the City; however, several are privately-owned residential parcels. Additional parcel acquisition will be needed in order to build a continuous trail.

Other opportunities in Segment 6 include shoreline restoration such as removing non-native invasive plant species (Japanese knotweed is prevalent) and replanting with native species that can help with bank stabilization and riparian shading of the river.

4.7 SEGMENT 7

Segment 7 is broken into four sub-segments due to similar land use and the underlying zoning. Segment 7A is Snoqualmie's historic downtown comprised of 306 acres of land within the 100-year floodplain of the Snoqualmie River between RM 41.2 and 43.1. South of Segment 7A are smaller Segments that include 7B (29 acres), 7C (36 acres) and 7D (26 acres).

4.7.1 Land Use and Public Access

Existing Land Use

Land use patterns in Segment 7A are represented by a combination of public open spaces, city parks, schools, businesses, low-density residential development and the Northwest Railway Museum. The Comprehensive Plan map indicates the future land use for this area as residential and business/retail. The existing shoreline environment designation for this area is Urban Floodplain Shoreline Environment.

The Snoqualmie Middle School and the Weber Construction yard (a truck service company) occupy Segment 7B. Segment 7C includes 36 acres of private residential farm land. The Comprehensive Plan map indicates future land use for this area as residential. Segment 7D is comprised of single-family residential homes and property that was the site of the former Honey Farm (recently purchased for the headquarters of Encompass, a child education / early learning center. . The Comprehensive Plan map indicates future land use for this area as residential, business/retail and office park. The existing shoreline environment designation for these areas is Urban Floodplain Shoreline Environment. There is no public access opportunity to the shoreline riverfront within these Segments.

4.7.2 Transportation

The major north-south road in Segment 7A is SR 202. Other smaller roads provide access to residential areas and the downtown historic commercial district from SR 202. The Snoqualmie Valley railroad runs parallel to SR 202. SR 202 bisects Segment 7B. There are no major transportation facilities in Segments 7C or 7D.

The City's *2010-2015 Capital Facilities Plan* lists five improvement projects proposed within Segment 7A. One project involves improvements to lane width, intersections, sidewalks and parking access along SR 202 between SE Northern Street and Meadowbrook Way SE to occur in three phases. A portion of another project crosses Segment 7A to include improvements to lane width and path/sidewalks along SR 202 from SE Northern Street to the Snoqualmie Parkway. Another project identified includes the construction of new turn lanes and the installation of traffic signals at the intersection of SR 202 and SE River Street. Another project involves the extension of Newton Street from Silva Avenue SE to Doone Avenue SE to include vehicular travel surfaces, curb, gutter and sidewalk improvements. A separate project involves adding left and right turn lanes at the intersection of Meadowbrook Way SE and SR 202. There are no transportation improvements to Segments 7B, 7C or 7D.

4.7.3 Wastewater and Stormwater Utilities

The majority of the historic downtown area (Segment 7A) is served by the City's sewer system. There is a network of sewer mains and several pump stations located throughout the City's historic downtown area. Segment 7D is also served by the City's sewer service, however, Segments 7B and 7C are not.

Segment 7A has an extensive stormwater system consisting mainly of closed pipe conveyance the majority of which outlet to the Snoqualmie River. There is one small section that conveys flows to the East Fork Kimball Creek, while there are a few areas that outlet into adjacent wetlands.

Segment 7D is a newer housing development and stormwater flows are directed to a constructed stormwater pond adjacent to the development.

4.7.4 Impervious Surface

Segment 7 has the highest percentage of impervious surface as the majority of it is comprised of the historic downtown area and other development such as housing and schools. There is a data gap regarding the available information and the ability to calculate impervious surface.

4.7.5 Critical Areas

Several large wetland complexes surround Segment 7 and its sub-segments. These wetland complexes and the south fork of Kimball Creek as well as their buffers, were mostly included in Segment 8; however portions are included in Segment 7 as the segment lines were not drawn along critical area boundaries, but rather around similar property uses and zoning. The wetlands in the vicinity of Segment 7 are classified as palustrine forested and emergent and are seasonally flooded.

Portions of Segment 7B, 7C, and 7D are located adjacent to these wetlands, the south fork of Kimball Creek, as well as the wetland and stream buffers.

4.7.6 Floodplain and Channel Migration Zone

All portions of Segment 7 are located in the floodway or floodplain of the Snoqualmie River.

No portions of Segment 7 are located in the channel migration zone of the Snoqualmie or South Fork Snoqualmie Rivers.

4.7.7 Historical or Archaeological Sites

Several properties and structures listed as historical sites are located in Segment 7; specifically in Segment 7A.

The first of these structures is the Snoqualmie Depot located on East King Street; it was constructed in 1889-1890. The depot currently houses the Northwest Railway Museum.

The Snoqualmie School Campus located at the intersection of King and Silva Streets is also located in the shoreline jurisdiction. The buildings were constructed between 1911 and 1920. Several of the buildings are in use today by the Snoqualmie School District.

The final property listed within the shoreline jurisdiction is the "Messenger of Peace" Chapel Car. The wooden rail car is located at 38625 SE King Street and was built in the late 1800s, with use during the early to mid 1900s. The rail car is located at the Northwest Railway Museum.

4.7.8 Opportunity Areas

Segment 7 will always have the highest amount of development and thus the highest amount of impervious surface. Due to Segment 7 being located in the floodway, there will not be additional construction in this Segment. Permitting for the reconstruction of properties already requires that properties requesting an addition be built up rather than built out.

4.8 SEGMENT 8

Segment 8 includes the left bank of the Snoqualmie River beginning at a point approximately 350 feet upstream from Meadowbrook Bridge (RM 41.8) downstream to the eastern city limits (RM 44.1). Segment 8 also includes the left bank of the South Fork Snoqualmie River from the southern city limit boundary downstream to its mouth of the Snoqualmie River (RM 0) as well as the right bank starting at its mouth with the Snoqualmie River to a point approximately 2,500 feet upstream (RM 1). Additionally, 3 Forks Natural Area, Meadowbrook Farm and forest land west of SR 202 make up the rest of Segment 8. The entirety of Segment 8 is approximately 758 acres.

4.8.1 Land Use and Public Access

Land Use

All of Segment 8 is comprised of public open space to include Three Forks Natural Area and Meadowbrook Farm. Of the 418-acre Three Forks Natural Area, 165-acres are located within Snoqualmie's shoreline jurisdiction. Three Forks Natural Area is a public natural and passive recreation area offering public trails that connect with the King County regional Snoqualmie Valley trail system. Some of the meadow area is currently used as an off-leash dog area. South of this area is the 458 acre Meadowbrook Farm jointly owned by the City of Snoqualmie and the City of North Bend. 247 acres of the farm are located within Snoqualmie's shoreline jurisdiction. Meadowbrook Farm is a natural, passive recreation and informal active recreation area offering interpretative public trails. The remainder of Segment 8 is vacant forested open space. The Comprehensive Plan map indicates the future land use to be residential and parks/open space. The existing shoreline environment designation for this area is Urban Floodplain Shoreline Environment.

Public Access

The Three Forks Natural Area offers several existing and potential public visual and physical access points to the Snoqualmie River shoreline in Segment 8. An existing visual access is provided from the Snoqualmie Valley trail pedestrian bridge where the Snoqualmie River can be viewed. Further upstream, the Snoqualmie River shoreline can be physically accessed from one of the natural trails. Two potential access points were identified further upstream during a field reconnaissance.

4.8.2 Transportation

The major roads that cross Segment 8 include SR 202, Meadowbrook Way and Park Street. The Snoqualmie Valley Railroad crosses the southern portion of Segment 8.

The City's *2010-2015 Capital Facilities Plan* lists two improvement projects proposed within Segment 8. One project involves the replacement of two small bridges that have rotting wood pilings and abutments located on Meadowbrook Way south of SR 202. Another project identified includes the placement of new asphalt on Meadowbrook Way south of SR 202.

4.8.3 Wastewater and Stormwater Utilities

Segment 8 is not served by sewer. According to the 2003 General Sewer Plan (TetraTech), there is no plan to expand sewer service to this area. Due to this Segment being located in the floodplain there is very little residential housing in this Segment and for this same reason additional housing in this Segment will be restricted.

There is a data gap regarding how stormwater is treated or routed through Segment 8.

4.8.4 Critical Areas

Portions of Kimball Creek wind through Segment 8. This portion of Kimball Creek is included in the shoreline jurisdiction because of its association with the floodplain. The creek does not meet the

criteria as a shoreline of the state because its mean annual flow is less than 20 cfs. Kimball Creek and its riparian buffers are considered Fish and Wildlife Habitat Conservation Areas.

Another significant portion of Segment 8 is the eastern city boundary that is located along the banks of the South Fork Snoqualmie River. The River and its riparian buffer are considered fish and wildlife habitat conservation areas. The Snoqualmie River is designated priority habitat by WDFW for Snohomish Coastal Cutthroat.

Approximately 9,504 feet of Segment 8 is located along the Snoqualmie River on the northern portion of Segment 8 as well as the northern City limits. The area encompasses the riparian buffer of the Snoqualmie River and is considered a Fish and Wildlife Habitat Conservation Area.

There is an extensive wetland complex associated with Segment 8. Portions of these wetlands are associated with old oxbows of the Snoqualmie River. There are also extensive wetlands associated with Kimball Creek.

4.8.5 Floodplain and Channel Migration Zone

All of Segment 8 is located in the floodplain of the Snoqualmie and South Fork Snoqualmie Rivers.

The western portion of Segment 8, west of the King County Snoqualmie Valley trail, is located in the channel migration zone of the Snoqualmie and South Fork Snoqualmie Rivers and is at severe risk for channel migration.

4.8.6 Historical or Archaeological Sites

There are no known historical or archaeological sites in Segment 8.

4.8.7 Opportunity Areas

Segment 8 has nearly unlimited opportunities for restoration and conservation; many of which are already in place. Three Forks Park and Meadowbrook Farm are both located in Segment 8 and both have a Master Plan dedicated to the restoration and conservation of these properties.

Additional resources located in Segment 8 include the East Fork Kimball Creek and extensive wetlands. Many parts of these features are associated with the park and farm mentioned above.

Many restoration activities have already taken place in the Park and on the Farm, with many more planned for the future. Because these large parcels of land have already been set aside for conservation, it is recommended that the restoration recommendations be put in place as soon as possible. Many of the recommendations include the removal of non-native invasive plants and replacement with native species.

An additional opportunity is to encourage the use of citizen volunteers to help with the labor. This can, and should, encourage the involvement of local schools as part of science/environmental education.

4.9 SEGMENT 9

Segment 9 includes the area south of Meadowbrook slough, west of South Fork Snoqualmie River, east of Boalch Avenue SE and north of southern city limits. The entirety of Segment 9 is approximately 148 acres.

4.9.1 Land Use and Public Access

Land Use

The land use in Segment 9 is comprised of the Mount Si golf course and a storage warehouse. The King County regional trail system travels through the golf course property. The Comprehensive Plan map indicates the future land use to be parks/open space for Segment 9. The existing shoreline environment designation for this area is Urban Floodplain Shoreline Environment.

Public Access

There is no public access opportunity to the Snoqualmie or South Fork Snoqualmie Rivers shoreline areas within this segment; however, the King County regional trail system is located on the golf course property and travels through Segment 8. The trail provides use for walking, cycling, and equestrian use.

4.9.2 Transportation

Boalch Avenue is the only road that provides transportation access to Segment 9. There is no transportation improvement projects planned for Segment 9.

4.9.3 Wastewater and Stormwater Utilities

Segment 9 is not served by the City's sewer system. There are very few, if any, residential properties in this segment.

There is a data gap regarding how stormwater is treated or routed through Segment 9.

4.9.4 Critical Areas

There are no mapped wetlands or streams within Segment 9. On the north side of Segment 9, there is a mapped wetland (located in Segment 8), and the buffer of this wetland is located in Segment 9.

4.9.5 Floodplain and Channel Migration Zone

The entirety of Segment 9 is located in the floodway or floodplain of the Snoqualmie and South Fork Snoqualmie Rivers.

The majority of Segment 9 is located in the channel migration zone of the Snoqualmie and South Fork Snoqualmie Rivers and is at moderate risk for channel migration.

4.9.6 Historical or Archaeological Sites

There are no known historical or archaeological sites in Segment 9.

4.9.7 Opportunity Areas

Potential opportunity for shoreline restoration exists along the south side of Meadowbrook slough in Segment 9. Restoration may include removing non-native invasive plant species and replanting with native species for bank stabilization.

4.10 SEGMENT 10

Segment 10 includes the area immediately southwest of Snoqualmie's historic downtown, outside the current city limits. Segment 10 is comprised of 158.20 acres of land within the 100-year floodplain of the Snoqualmie River between RM 41.2 and 42. The existing shoreline environment designation for Segment 10 is Urban Floodplain Shoreline Environment.

4.10.1 Land Use and Public Access

Existing Land Use

The land use pattern in Segment 10 is primarily comprised of vacant and low-density residential properties. The Comprehensive Plan map indicates the future land use for this area as residential.

Public Access

There are no public access points to Kimball Creek, as the majority of the stream is surrounded by residential housing. Kimball Creek can be viewed from road crossings at the intersections of SE 76th Street, SE 80th Street, and 384th Avenue SE.

4.10.2 Transportation

There are no major transportation facilities in Segment 10. Smaller roads provide access to residential areas. No transportation improvement projects are currently planned for Segment 10.

4.10.3 Wastewater and Stormwater Utilities

Segment 10 is served by the City's sewer system, but includes areas still served by private septic tanks. Leaching septic systems that are not properly functioning and upstream hobby farms likely contribute to ongoing water quality problems in Kimball Creek, which drains most of this area. Kimball Creek has impaired (violation of state standards or failure to meet TMDL guidelines) water quality for temperature, dissolved oxygen, pH, and fecal coliform. Kimball Creek is a basin of concern for the nutrient parameter, which is a minor failure to meet standards (Kaje 2009).

The City has an adopted Stormwater Comprehensive Plan (TetraTech 2010); however, while it contains some analysis of water quality conditions and drainage problems within the Kimball Creek subbasin (Tetra Tech 2010, Ch. 5) it does not include stormwater management plans for the UGA as this area is outside of the City's jurisdiction.

4.10.4 Critical Areas

Kimball Creek flows north/northwest through Segment 10. At the southern portion, Kimball Creek is mapped by NWI as a palustrine scrub-shrub wetland. Through aerial photography, it appears that the southern portion of Kimball Creek (in Segment 10) may function more like a wetland. This is likely the result of a beaver dam, which has been mentioned in several documents regarding Kimball Creek. Near the west end of SE 85th Street, it appears that Kimball Creek becomes more channelized as it continues its north/northwesterly path before converging with Coal Creek. NWI includes four other wetlands in the northeastern section of Segment 10. Three of them are on the west side of 384th Avenue SE (two are palustrine scrub-shrub, one is palustrine emergent), and one is on the west side of 382nd Avenue SE (palustrine scrub-shrub).

WDFW maps this portion of Kimball Creek as habitat (including migration) for resident cutthroat trout.

The majority of Segment 10 is mapped by King County as a Category II Critical Aquifer Recharge Area.

4.10.5 Floodplain and Channel Migration Zone

The entirety of Segment 10 is located within the 100-year floodplain of the Snoqualmie River.

No portion of Segment 10 is located in the channel migration zone of the Snoqualmie or South Fork Snoqualmie Rivers.

4.10.6 Historical or Archaeological Sites

There are no known historical or archaeological sites in Segment 10. Many of the homes in Segment 10 were moved there from the old Snoqualmie Falls Town site near the Weyerhaeuser Mill.

4.10.7 Opportunity Areas

Segment 10 has a unique opportunity to improve water quality in Kimball Creek through conversion of septic tanks to the City's sewer system as well as coordination with hobby farmers to improve livestock management and reduce the use of fertilizers. Additionally, many stretches of Kimball Creek lack wooded riparian areas and are dominated by non-native invasive species such as Himalayan Blackberry. Riparian habitat restoration, such as the installation of woody native plant species would provide bank stabilization, shade to help reduce water temperatures, and in-channel habitat.

4.11 SEGMENT 11

Segment 11 includes the right bank of the Snoqualmie River from 730 feet upstream of the SR 202 Bridge continuing upstream to the Snoqualmie Valley trail bridge, including Borst Lake. The entirety of Segment 11 is approximately 311.30 acres.

4.11.1 Land Use and Public Access

Existing Land Use

Segment 11 primarily consists of privately owned forested open space, vacant and undeveloped. The Comprehensive Plan map indicates the future land use for this segment as Open Space. The previous King County shoreline designation for this area adjacent to the Snoqualmie River is Conservancy Shoreline Environment and Conservancy Shoreline Environment immediately adjacent to Borst Lake.

Public Access

There are a few existing visual public access points to Borst Lake off of Mill Pond Road. Prior to annexation of this area to the City in 2012, the property owners executed a Preannexation Agreement with the City, which includes a provision requiring the property owners to provide right of way to the City for a riverwalk trail corridor between SE Mill Pond Road and the Snoqualmie River. The riverwalk trail would connect to the existing King County Regional Snoqualmie Valley Trail system.

4.11.2 Transportation

There are no major transportation facilities in Segment 11. SE Mill Pond Road circumnavigates Borst Lake. At the southern end of Segment 11 and Borst Lake, Meadowbrook Way SE intersects SE Mill Pond Road via a bridge across the Snoqualmie River. There are no transportation improvement projects currently planned for Segment 11.

4.11.3 Wastewater and Stormwater Utilities

There are no current or planned wastewater utilities located within Segment 11.

The City has an adopted Stormwater Comprehensive Plan (TetraTech 2010); however, because this plan was prepared prior to City annexation of the properties within Segment 11, the Stormwater Comprehensive Plan does not currently include a stormwater management plan for Segment 11.. The Stormwater Comprehensive Plan is in the process of being updated.

4.11.4 Critical Areas

The right bank of the Snoqualmie River, Lake Borst, and associated wetlands encompass the majority of Segment 11. Lake Borst, also referred to as Mill Pond, was previously used for logging and milling activities. At least a portion of Lake Borst is thought to be a former oxbow of the Snoqualmie River. Lake Borst is very round in shape, indicating it was likely modified for the logging and mill operation. In the center of the lake is a large island that is wetland complex listed by NWI as having palustrine aquatic bed, scrub-shrub, and forested communities. Outside of the "ring" of the lake, there are wetlands to the south, southwest, and southeast with aquatic bed, scrub-shrub, and forested communities.

Two WDFW designated priority habitats exist within Segment 11. One is the Snoqualmie River for Snohomish Coastal Cutthroat, and the other is the area surrounding and the higher ground in the

center of Borst Lake that is designated for Roosevelt Elk. Additionally, the river and its riparian buffer are considered Fish and Wildlife Habitat Conservation Areas.

Segment 11 is mapped by King County as a Category II Critical Aquifer Recharge Area.

4.11.5 Floodplain and Channel Migration Zone

All of Segment 11 is located in the floodway of the Snoqualmie River. According to King County GIS mapping (iMap 2012), the right bank of the Snoqualmie River is rated as severe risk for channel migration. Slightly further inland from the river, but in a band that roughly parallels the river, and includes the southern and western portions of Borst Lake, there is a moderate potential for channel migration. The north/northeast portions of Borst Lake are rated as having potential for channel migration.

4.11.6 Toxic or Hazardous Waste Sites

A 1993 Class II Inspection conducted by Ecology at the Weyerhaeuser Company Wood Products Division- Snoqualmie Facility detected various levels and types of contaminants in the sediment in Borst Lake and water on the facility, some of which drain to Borst Lake.

Contaminants that were found in water samples included acetone and chloroform as well at low concentrations of benzene, toluene, ethylbenzene and total xylenes. Base/neutrual and acid (BNA) compounds and heavy metals such as arsenic, copper, zinc, lead and cadmium were also found in water samples. Three sediment samples were taken and found to have concentrations of oil, grease and other organic compounds. Bioassay tests were also conducted and found little adverse effects from the water contaminants to the test organisms, while the test organisms were sensitive to the sediments (Ecology 1994b). At that time discharge from Borst Lake met the limitation in the stayed NPDES permit, but the sivacel facility exceeded the daily average (but not the daily maxium limitation) for total susupended solids (TSS) and the 5-day biochemical oxygen demand (BOD_5).

4.11.7 Opportunity Areas

Segment 11 is already zoned as open space area and there is only one road through this Segment. It is assumed that roadway runoff drains directly into the adjacent wetlands and Borst Lake. Maintaining dense vegetation along these corridors will help maintain or improve water quality. A more effective stormwater management plan for SE Mill Pond Road should be implemented if there are major improvements or widening made to the road. The need for control of non-native invasive species is prevalent in many areas along SE Mill Pond Road, particularly near the south and southeast ends of the lake. Along the sides of the road there are dense stands of Himalayan blackberry. Near the intersection of SE Reinig Road and 396th Drive SE, (the area southeast of Borst Lake) there are very dense stands of Himalayan blackberry, Japanese knotweed, and English ivy.

4.12 SEGMENT 12

Segment 12 is located immediately north of Borst Lake, east of Snoqualmie sewage treatment plant and west of 396th Drive SE. The entirety of Segment 12 is approximately 217.70 acres and is located

within the City's UGA. The majority of Segment 12 is located entirely within the 100 year floodplain.

4.12.1 Land Use and Public Access

Existing Land Use

Segment 12 is the site of a former Weyerhaeuser lumber mill, which closed in 2003. The site contains a number of remnant lumber mill structures, including large wood frame buildings and the former brick powerhouse and smokestack, along with a network of unpaved roads, drainage ditches and cleared areas. The site is currently occupied by a specialized driving instruction school and a small wood recycling and topsoil production business. The Comprehensive Plan map indicates the future land use for this segment as Planned Commercial/Industrial. The current King County shoreline designation for this area is High Intensity Shoreline Environment. The current King County zoning for this area is Industrial. In 2017, the property's owners submitted an application for a 3-phase, Planned Commercial / Industrial plan. The application proposes the following: Phase I (wine production / wine tasting /restaurant / residential uses); Phase II (Office park uses); and Phase II (industrial / warehouse uses). Environmental review of the proposed Planned Commercial / Industrial Plan is currently underway.

Public Access

King County's regional Snoqualmie Valley Trail corridor exists to the northwest and southeast of Segment 12. Prior to annexation of this area to the City in 2012, the property owners executed a Pre-Annexation Agreement with the City, which requires the property owners to provide right of way for a trail corridor to complete a missing link in King County's Regional Snoqualmie Valley Trail.

4.12.2 Transportation

There are no major transportation facilities in Segment 12. Small, private roads provide access into and through the former mill site. There are no transportation improvement projects planned for Segment 12, other than streets / driveways associated with the proposed Planned Commercial / Industrial Plan.

4.12.3 Wastewater and Stormwater Utilities

Prior to the mill closure in 2003, the mill treated some of its waste onsite and sent some waste to the Snoqualmie treatment plant. There is a data gap regarding how wastewater is treated and/or removed from the former mill site.

The City has an adopted Stormwater Comprehensive Plan (TetraTech 2010); however, because that plan was prepared prior to City annexation of Segment 12, the Stormwater Comprehensive Plan does not include a stormwater management plan forSegment 12.

4.12.4 Critical Areas

At the northern limit of Segment 12 there is a large wetland complex, most of which lies north of Segment 12. Portions of the wetland that lie within Segment 12 include palustrine scrub-shrub and palustrine forested wetland that is included on the NWI map.

There is a series of ditches within the former mill area, most of which were created to accommodate the former mill site roads. A stream reconnaissance was conducted by Altman Oliver Associates, LLC in September 2011 and a brief email correspondence regarding the findings and a map was provided to the City. The information indicates that there is a Type F (fish-bearing or meets the physical criteria to be potentially used by fish) stream at the north end of the mill site that flows east to west through a wetland in which salmonid fry were observed. It was noted that King County GIS layers do not accurately reflect the location of the Type F stream. There are also numerous ditches throughout the site, as well as a Type N (may or may not have year-round flow, but do not meet the physical criteria to support fish) stream (some of which is piped) on the east side of the mill site that outlets to Borst Lake (DNR 2011). The pre-annexation agreement requires a sensitive area study be completed. Environmental review of the proposed Planned Commercial Industrial Plan will also provide more specific analysis of on-site stream, wetlands and water quality.

The southeast corner of Segment 12 is listed by WDFW as a priority habitat for Roosevelt Elk.

The northern portion of Segment 12 is mapped by King County as a Category I Critical Aquifer Recharge Area. The former mill site is not categorized by King County pertaining to groundwater.

4.12.5 Floodplain and Channel Migration Zone

Segment 12 is located within the floodplain of the Snoqualmie River. The south and southwest portions of Segment 12 are documented as having potential for channel migration.

4.12.6 Historical or Archaeological Sites

Segment 12 contains what remains of the former Snoqualmie Lumber Co. brick wood-fired powerhouse and smokestack. These structures are a designated King County landmark and are included on the Most Endangered Historic Properties list maintained by the Washington Trust for Historic Preservation. The annexation agreement includes a provision that the property owner coordinate with the City and King County Historic Preservation Office for protection and potential adaptive re-use of the powerhouse structures.

4.12.7 Toxic or Hazardous Waste Sites

The former Weyerhaeuser Snoqualmie Mill is listed on the EPA Envirofacts website for having permits to discharge chemicals or substances through pipes. The last Toxic Releases for Reporting listed on the EPA website was last updated for 1988, and the mill closed in 2003.

Numerous studies and report documents exist regarding toxic or hazardous waste contamination at the former mill site. According to a City staff report for the proposed mill area annexation, "Multiple locations on the site could have soil, surface water and groundwater impacts due to the

presence of different fuels, chemicals and other fluids stored or used onsite." These areas include: the former under and above ground storage tanks, the former plywood plant, the morbark area, the powerhouse and sawmill, the lumber strapping area, and the Pentachlorophenol (PCP) dip tanks. The quantity of contaminants in these areas depend on the past activities. Contaminants that were the most common included BTEX (gasoline components), Total petroleum hydrocarbons and diesel range organics (TPH/T(E)PH&DRO), PCP, tetra/trichlorinated benzenes (T/TCBs) and polychlorinated biphenyls (PCBs). Additionally, some heavy metals, such as arsenic, lead, copper, zinc and cadmium were also found. However, the copper, zinc and cadmium were found to be at a lesser extent than the arsenic and lead (City of Snoqualmie 2011).

Previous property owners conducted a number of environmental site assessments pursuant to the State Model Toxics Control Act and completed clean-up as recommended by the reports. While the site is not currently required by State or Federal agencies to undergo remedial action, these studies do indicate that the presence of fuels and chemicals which may eventually lead to additional required or voluntary cleanup efforts.

4.12.8 Opportunity Areas

There are numerous opportunities for the improvement of ecological functions in Segment 12. First, cleanup of any remaining toxic and hazardous waste materials would benefit all systems, including human health as well as those of fish, animals, and general water quality. As the area is redeveloped, runoff (from typical rainfall, not including floods) from buildings and roads should be directed through systems that can help improve water quality. These may include vegetated swales and should include systems with oil separators depending on the type of industry in the area. The Pre-Annexation Agreement approved in 2011 in conjunction with the proposed annexation of the mill area prohibits any development within the annexation area until further analysis is completed to assess the presence of toxic or hazardous contamination within the area and address appropriate clean-up.

5.0 ANALYSIS OF ECOLOGICAL FUNCTIONS AND ECOSYSTEM WIDE PROCESSES

Ecology requires a three-step process to determine the ecological processes that are occurring within a shoreline jurisdiction, they are: determine the existing relationship between landscape-scale processes; assess the performance of ecological functions (to qualitatively assess which functions are present, degraded or not present); and recommend measures to maintain or restore the functions associated with the ecosystem-wide processes based on existing conditions and potential future conditions.

5.1 OVERVIEW OF LANDSCAPE-SCALE PROCESSES

Four landscape-scale processes have been assessed and scored for each Shoreline segment: water flow; vegetation; hyporheic flow; and habitat. This assessment determines the existing quality of function of Shoreline segments.

Items considered in this assessment of the landscape-scale processes include:

- The presence/absence of dams, outlet structures, or other structures which may have changed the hydroperiod;
- The percent of imperviousness (effective) in the contributing watershed;
- The presence/absence of flooding problems or connectivity between the shoreline and its floodplain;
- Habitat for listed and priority species;
- Identified or documented water quality problems;
- Conditions in the contributing area that imply the potential for significant sediment or pollutant loading; and
- Evidence of the presence of contaminated sediments.

Water Flow: Water flow relates to the natural movement of water through a stream channel or into and out of a wetland or lake, the physical complexity of vegetation overhanging the shore, and the presence or absence of physical structures that influence water movement in/through the shoreline environments.

Water flows unconstricted through the City by way of the Snoqualmie River, South Fork Snoqualmie River, and Kimball Creek. Near the northwest edge of the City limits, the Snoqualmie River flows approximately 270 hundred feet over Snoqualmie Falls. There is a dam at the top of the falls that regulates flow.

On Kimball Creek outside the city limits there had been a beaver dam which has altered the flow of the stream, the dam has been removed, but unless the beavers were physically relocated, they will likely rebuild in the vicinity.

Vegetation: The presence and the condition of native vegetation within the Shoreline zone relates to its ability to filter sediments, influence water temperature, provide structure for wildlife use; provide food sources for wildlife; provide bank stabilization, and provide a source for LWD recruitment.

Hyporheic Flow: In order to assess how the streams and wetlands function in relation to hyporheic flow it must be determined the extent of connectivity that remains between the shoreline water and the surrounding shallow groundwater in the immediate vicinity of these water bodies relative to late summer recharge; influence on shallow groundwater, and water quality.

Streams and rivers have less ability to store sediment on a long term basis due to their flow-through nature. When the water is slower moving (summer/early fall), sediments drop out, but when these systems are moving fast due to high rainfall or snow melt events, the sediment will mobilize and be moved downstream. The main areas of the City's shoreline that will function to store sediment are the wetlands and floodplains adjacent to the jurisdictional stream and rivers. The floodplains and wetlands primarily receive sediment during flood events. It is during these same flood/high flow events that the systems are going to experience erosion and input sediment to the system, which will make its way downstream.

5.2 PROCESSES AND FUNCTIONS FOR SNOQUALMIE SHORELINE AREAS

Ecological processes and functions of the twelve Shoreline segments within the City of Snoqualmie and the UGA are summarized in Appendix D. Each Segment was given a qualitative rating score of 1-5 indicating low, low/moderate, moderate, moderate/high, and high functions when compared to the other Shoreline Segments in the City. Table 5.1 compares the function scores between each Segment to illustrate the relative degree that each Segment may provide a particular function compared to another Segment within the City's shoreline jurisdiction.

In Table 5.1, the resulting scores are separated by segment and by function. As mentioned previously, the qualitative scores range from 1 through 5 (from low to high function). Because the scores were qualitatively assigned, no sums or averages were used to conclude the outcome.

Table 5.1 Function Score by Segment

Functions	Segments										
	1	2	3	4	5	6	7 & 10	8	9	11	12
Hydrologic											
Transport or storage of water and sediment	3	2	4	2	4	3	2	4	4	4	2
Attenuation of flow energy	2	3	4	1	3	2	2	5	3	5	2
Developing pools, riffles, gravel bars	3	2	NA	NA	3	3	2	2	2	4	NA
Recruitment and transport of LWD and other organic material	2	2	3	2	3	2	2	4	4	5	1
Vegetation											
Maintaining temperature	2	2	2	2	3	1	2	3	2	3	1
Removing excess nutrients and toxic compounds	2	2	4	2	3	1	2	4	3	4	1
Sediment removal and bank stabilization	3	2	5	2	4	2	2	4	2	4	1
Attenuation of flow energy	2	2	NA	NA	4	3	3	5	3	5	2
Provision of LWD and organic matter	4	2	4	1	4	2	2	4	3	4	2
Hyporheic											
Removing excess nutrients and toxic	2	2	4	2	4	2	2	4	2	4	1
Water storage	2	2	3	2	4	2	2	4	3	4	1
Support of vegetation	4	2	4	2	4	2	2	4	2	4	2
Sediment storage and maintenance of base flows	2	2	4	2	4	2	2	4	2	4	1
Habitat											
Physical space and conditions for life history	4	2	5	2	4	3	3	5	3	5	2
Food production and delivery	4	3	4	1	4	2	2	5	3	5	2

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6.0 LAND USE ANALYSIS

6.1 LIKELY CHANGES IN LAND USES

Major land use changes are limited within Snoqualmie's shoreline jurisdiction. Over half of the existing land uses within the shoreline jurisdiction are permanent open space and public parks, generally consistent with the planned uses as illustrated in the Comprehensive Plan. The existing residential uses along the bank of the Snoqualmie River shoreline are designated Parks/Open Space in the Comprehensive Plan, which will change the future land use of this area. If the opportunity presents itself, the City will consider property acquisitions of riverfront properties to provide public access along the shoreline.

Residential properties found in the downtown core are predominately zoned "Constrained Residential" (1 unit per 5 acres), which provides limited density within the floodplain. These properties are generally developed to their full potential under current land use regulations as single-family homes, and therefore changes would likely be limited to remodels, additions and tear-down/rebuilds.

In 2015, the City adopted a zoning map amendment for a small one or two-block portion of the "Constrained Residential" district on Olmstead Avenue between King and River Street within the floodplain that was developed with small single-family housing. The zoning amendment allowed for a modest increase in density for this area in order to accommodate attached, low-rise (2-3 story) townhomes, in order to implement a recommendation of the Downtown Master Plan and provide consistency with the comprehensive plan land use designation., .

In areas designated as floodway by FEMA, no new residential construction is allowed. A relatively smaller portion of downtown is designated business/retail. Some of the uses within this designation are currently developed as residential and may redevelop into business/retail type uses. Furthermore, wetlands and associated stream and wetland buffers severely restrict development in some areas.

For the former Snoqualmie Mill site, in 2017 the property's owners submitted an application for a 3-phase, Planned Commercial / Industrial plan. The application proposes the following: Phase I (wine production / wine tasting /restaurant / residential uses); Phase II (Office park uses); and Phase II (industrial / warehouse uses). Environmental review of the proposed Planned Commercial / Industrial Plan is currently underway. As part of development of the property, property owners will be required to comply with the Preannexation Agreement, which includes a provision to provide right of way to the City for a riverwalk trail corridor between SE Mill Pond Road and the Snoqualmie River. And, the Borst Lake area may allow for the opportunity of limited recreational uses, depending on results of future water quality assessment.

Proposed redevelopment of any other UGA lands within shoreline jurisdiction (e.g., along Kimball Creek west of historic downtown, between 384th Avenue SE and SE 80th Street) are presently under the jurisdiction of King County. The City will have shoreline jurisdiction of the lands currently within the UGA when the lands are annexed. Currently there are no projects planned within the

UGA that are within the shoreline jurisdiction; however, This portion of the UGA next to Kimball Creek will likely remain single-family residential.

The Snoqualmie Falls power plant uses within the utility park designation are unlikely to change under the present Puget Sound Energy management.

6.2 IMPLICATIONS IN SHORELINE MANAGEMENT

Based on the guidance provided in WAC 173-26-211, a range of Shoreline Environment designations would appear to be appropriate in the City of Snoqualmie's shoreline jurisdiction. Environment designations must be based on existing land use patterns, the biological and physical character of the shoreline, the goals and aspirations of the community as expressed in the Comprehensive Plan, as well as the criteria provided in WAC 173-26-211(4) and (5). In delineating environment designations, the City of Snoqualmie must assure that existing shoreline ecological functions are protected with the proposed pattern and intensity of development. Figure 4 in Appendix C shows the preliminary shoreline segments.

The basic intent of designating shoreline environments is to encourage development that will preserve the current condition or enhance the desired future character of the shoreline. Shoreline environment designations are categories that reflect the type of development that either exists or should take place in a given area.

Based on the preliminary findings of this report, six shoreline environments are being considered. The Shoreline Characterization and Analysis Report provides an inventory of natural and built conditions within the City's shoreline jurisdiction. The conditions identified in the inventory have informed the constructing of the recommended shoreline environments and the most appropriate environments selected. The six City of Snoqualmie shoreline environment designations are:

- Urban Riverfront
- Urban Floodplain
- Urban Conservancy
- Hydropower
- Natural
- Aquatic

The proposed environment designations are discussed below.

6.2.1 Urban Riverfront Environment

The Urban Riverfront Environment designation would protect and restore ecological functions of open space, floodway, and other sensitive lands where they exist in urban and developed settings, while allowing a variety of compatible uses to continue subject to federal, state, and local regulations governing development in the floodway.

The Urban Riverfront Environment would include the shoreline areas that most closely match the following characteristics:

- They are suitable for water-related or water-enjoyment uses;
- They consist of areas of riverfront properties adjacent to the historic downtown area that are now subject to the regulations governing development in the floodplain including the floodway.
- They have the potential for redevelopment that is compatible with ecological restoration;
- They are areas with existing non-water dependent shoreline development that will not be expanded;
- They have potential for ecological restoration

The Urban Riverfront Environment designation would be appropriate for shoreline areas of existing parks, open space, commercial and residential use within the floodway in the City of Snoqualmie, such as Segment 6. The area of shoreline designated as Urban Riverfront Environment would include the following Comprehensive Plan designations:

- Business – Retail
- Utility Park
- Open Space

The overall ecological function of the Urban Riverfront Environment area is generally low. The current low function is due to the predominance of effective impervious areas and the clearing of both shoreline and upland vegetation. As redevelopment of this area occurs, with restrictions of the level of development in a floodway, including recent project acquisition/restoration projects, the ecological function of this area could be expected to increase.

6.2.2 Urban Floodplain Environment

Urban Floodplain Environment designation would be assigned to shoreline areas with an urban setting within the City of Snoqualmie if they currently support residential, commercial, industrial or transportation uses, or are suitable and planned for non-water oriented uses, such as Segments 3, 4, 7A, 7B, 7C, 7D, a portion of 8, as well as Segments 10 and 12. In addition, the Urban Floodplain Environment designation would be assigned to upland areas outside of river and stream buffers that are subject to the City's Comprehensive Plan policies for development in the floodplain, and are suitable and planned for the continued development of low intensity commercial, industrial, and residential uses.

The Urban Floodplain Environment designation would be appropriate for shoreline areas of existing and planned industrial, commercial and residential use within the floodplain in the historic core of the City of Snoqualmie and the former mill site. The area of shoreline designated as Urban Floodplain Environment would be subject to the City's Floodplain Land Use policies and regulations and would include the following Comprehensive Plan designations:

- Business – Retail
- Planned Commercial/Industrial

- Office Park
- Open Space
- Residential
- Utility Park

The overall ecological function of the Urban Floodplain Environment area is generally low. The continued use of this area for a mix of small scale commercial, residential and industrial uses is appropriate. The current low function is due to the predominance of effective impervious areas and the clearing of both shoreline and upland vegetation within the floodplain. As build-out of the few remaining vacant parcels and redevelopment of existing structures occurs, the ecological function of this area is not expected to diminish given existing codes that prohibit fill in the floodplain and require compliance with the City's critical area, sewer, stormwater, and landscape requirements.

6.2.3 Urban Conservancy Environment

The Urban Conservancy Environment designation would protect and restore ecological functions of open space, floodplain and other sensitive lands where they exist in low intensive and developed settings, while allowing limited water-oriented uses and a variety of non-water oriented uses consistent with effective environmental management. The designation will provide for ecological protection and rehabilitation in relatively undeveloped shoreline areas anticipated for or containing existing low intensity agricultural, public park, recreation, and open space uses and limited development suitable to lands characterized by ecological and flood hazard constraints.

The Urban Conservancy Environment would include those shoreline areas that most closely match the following characteristics:

- They are suitable for water-related or water-enjoyment including non-water dependent uses;
- They contain agricultural or recreational uses;
- They are open space, floodplain, stream buffer or other sensitive areas that should not be more intensively developed;
- They have the potential for development that is compatible with ecological restoration;
- They have potential for ecological restoration;
- Areas that retain important ecological functions, even though partially developed.

The Urban Conservancy Environment designation would be appropriate for shoreline areas of existing open space and recreational uses within the floodplain in the City of Snoqualmie, such as a portion of Segment 8 and all of Segment 9 as well as a portion of Segment 11 in the City's UGA. The area of shoreline designated as Urban Conservancy Environment would include the following Comprehensive Plan designations:

- Residential
- Open Space
- Utility Park

The overall ecological function of the Urban Conservancy Environment area is generally good due to the predominance of public open space and low-density development on large lots. Over time, with the current restrictions on development in the area, the ecological function of this area could be expected to increase.

6.2.4 Hydropower Environment

The Hydropower Environment would ensure optimum use of shorelines that are presently developed or planned for hydropower and hydropower related uses while protecting and enhancing ecological functions.

The Hydropower Environment designation would be assigned to those areas that are presently developed or planned for hydropower and hydropower related uses, such as Segment 2.

The Hydropower Environment designation would be appropriate for shoreline areas of existing industrial, utilities, and commercial use within the shoreline of the Snoqualmie River in the City of Snoqualmie at or adjacent to the exiting Puget Sound Energy dam at Snoqualmie Falls. The area of shoreline designated as Hydropower Environment would include the following Comprehensive Plan designations:

- Business – Retail
- Open Space
- Utility Park
- Residential

The City should consider redesignating the area zoned residential to Utility Park as the existing use within this area is the parking facility associated with the Puget Sound Energy power plant below the falls.

The overall ecological function of the Hydropower Environment area is generally low. The continued use of this area for industrial, utilities, commercial and residential uses is appropriate. The current low function is due to the predominance of effective impervious areas and the clearing of both shoreline and upland vegetation, primarily to accommodate the existing and planned improvements at the Snoqualmie Falls hydroelectric facility. The hydropower facility was recently issued a new license by the Federal Energy Regulatory Commission (FERC), which allowed for some needed improvements to the facility and also required a number of environmental site and operational improvements, including DOE requirements for minimum flows to protect salmon downstream of the falls, and public access and enjoyment improvements. As the redevelopment of existing structures occurs, the ecological function of this area is not expected to diminish due to environmental protections provided by existing regulations and/or the FERC license requirements.

6.2.5 Natural Environment

The Natural Environment would preserve and enhance those shoreline areas relatively free from human influence or possessing natural shoreline functions intolerant of human use. These systems

require severe restrictions on the intensities and types of uses permitted to maintain the integrity of the natural shoreline environment.

Include within the Natural Environment those shoreline areas that most closely match the following characteristics:

- Ecologically intact areas;
- Areas currently performing an important, irreplaceable function in the shoreline ecosystem;
- Areas considered to represent ecosystems and geologic types that are of particular scientific and educational interest; and
- Areas unsuitable for development because of biophysical limitations.

The Natural Environment designation would be appropriate for shoreline areas of existing open space use within the floodplain in the City of Snoqualmie, such as Segments 1 and 5, and a portion of 8 as well as a portion of Segment 11 in the City's UGA. The area of shoreline designated as Natural Environment would include the following Comprehensive Plan designations:

- Parks/Open Space
- Utility Park

The overall ecological function of the Natural Environment area is generally high. The current high function is due to the predominance of natural areas on large parcels. Over time, with the current restrictions on development in the area, the ecological function of this area could be expected to increase.

6.2.6 Aquatic Environment

The Aquatic Environment would protect the unique characteristics of the areas waterward of the ordinary high-water mark by managing uses and activities and by assuring compatibility between upland and aquatic uses.

The Aquatic Environment would include those submerged lands waterward of the ordinary high-water mark, including all rivers, streams and associated wetlands designated shorelines of the state. The Aquatic Environment designation would include all submerged lands waterward of the ordinary high-water mark within Shoreline Master Program jurisdiction in the City of Snoqualmie and its UGA.

The overall ecological function of the Aquatic Environment area is generally high. The current high function is due to very limited over water development. Over time, with the current restrictions on development in the area, the ecological function of this area could be expected to increase.

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7.0 SHORELINE MANAGEMENT RECOMMENDATIONS

7.1 SHORELINE MASTER PROGRAM

7.1.1 Environment Designation Provisions

Recommendations for specific shoreline segments are discussed in Section 6.

7.1.2 General Policies and Regulations

Shorelines of Statewide Significance

The Snoqualmie is a Shoreline of Statewide Significance within the Shoreline Management Area in the City of Snoqualmie.

Archaeological and Historic Resources

Many areas within Snoqualmie's shoreline area have been previously graded or excavated through construction and/or agricultural use. The areas most likely to have been undisturbed are Segments 1, 3 (wetland area), and 5, 11 and portions of Segments 2 and 8. This does not preclude the possibility of finding artifacts and the Shoreline Master Program should provide clear direction regarding circumstances when a special study may be necessary, and what action to undertake in the event of an unexpected discovery. Per Ecology's SMP guidelines, the following standards shall be incorporated into the City's SMP:

- Require that developers and property owners immediately stop work and notify the local government, the office of archaeology and historic preservation and affected Indian tribes if archaeological resources are uncovered during excavation.
- Require that permits issued in areas documented to contain archaeological resources require a site inspection or evaluation by a professional archaeologist in coordination with affected Indian tribes.

Critical Areas Regulations

- Provide for critical area regulations within the Shoreline Jurisdiction that provide at least an equal level of protection to the current City-wide critical area regulations.
- Incorporate or reference the City's sensitive areas regulations, floodplain and hazard mitigation plans in the Master Program.

Flood Hazard Management Regulations

- Include policies and regulations that address the protection of properties located within the City's floodplain. Provisions should be included which limit development and shoreline modifications that interfere with channel migration and/or cause impacts to property or public improvements and net loss of ecological functions.

Parking Regulations

- Policies should be put in place that considers the location of parking lots for development or redevelopment in the areas closest to the Snoqualmie River. Parking lots should generally be placed away from the shoreline and vegetative planting strips or other vegetated areas should be placed between the shoreline and the parking area. Other low impact development practices are discussed below.

Public Access

- Public access to the shoreline within the Snoqualmie shoreline area is somewhat limited. Policies should be developed that more specifically address the City's goals and priorities for the development of shoreline public access sites. Sites that are both long term and short term priorities should be identified.
- Guidance should be provided for the construction of trails in environmentally sensitive shoreline segments, such as the proposed shoreline trail through Segments 5 and 6.
- In general, physical access for swimming, passive recreation (such as viewing areas and interpretive trails) and habitat enhancement should be important policy objectives for the management of shoreline public access sites.

Water Quality

- Existing single family residences with septic systems pose a continued source and risk of pollution to water bodies. Required connection to future sewer facilities will address this risk. Redevelopment to more intensive uses should not be allowed without sewer availability and existing development should be required to hook up to sewer when it becomes available to protect water quality.

Vegetation Management

- Conservation of existing native vegetation during land development and ongoing use is critical to maintaining the ecological processes and natural functions of shoreline areas.
- The removal of mature trees and native vegetation should be regulated in a manner that provides protection that is equal to or greater than current Sensitive Area Regulations.
- Vegetation removal in wetland areas and associated buffers within the shoreline vegetation management areas should also be restricted to allow only the removal of hazardous trees and noxious weeds. Additional flexibility can be provided for areas within currently developed yards and non-wetland areas where more intensive urban development is anticipated.
- Removal of non-hazardous mature trees and native vegetation should be limited within an established distance from the Snoqualmie River ordinary high water mark in shoreline environment designations to maintain the current level of high ecological function and value.
- Include provisions for continued monitoring and control of non-native invasive species.

Low Impact Development

- Encourage the use of Low Impact Development techniques within the Shoreline Management Area.

- Low impact development, such as those promoted through the Leadership in Energy and Environmental Design and Green Built programs should be encouraged.
- Use low impact development techniques on City parcels to set an example for the citizens.

7.1.3 Shoreline Modification Provisions

Shoreline Stabilization

- The SMP should encourage development to be designed and located in a manner to avoid future structural shoreline stabilization measures. If structural shoreline stabilization projects are necessary, the SMP should include provisions that encourage soft-shoreline stabilization measures opposed to hard-shoreline stabilization methods.

Piers and Docks/Boating Facilities

- Piers, docks and boating facilities upstream of Snoqualmie Falls do not currently exist in the City of Snoqualmie. These structures and amenities are not useful on Kimball Creek, and due to the extreme danger posed by Snoqualmie Falls, are not realistic on the Snoqualmie River downstream of Meadowbrook Bridge. Depending on futher water quality assessment, Borst Lake may offer opportunities for non-motorized boating facilities.

Fill

- As directed by the SMP Guidelines, provide appropriate limitations on placement of fill in shoreline areas, including areas waterward of the ordinary high water mark. Fills should be allowed as needed to implement shoreline restoration. Federal and state laws allow fill under certain permit conditions which apply regardless of the Shoreline Master Program.

Dredging and Dredge Material Disposal

- As directed by the SMP Guidelines, provide limitations on dredging (excavation) in shoreline areas. Dredging activities are not expected to occur on a frequent basis, but may be conducted as part of certain maintenance activities, to implement restoration projects, or culvert/bridge replacements. Federal and state laws allow dredging and material disposal under certain permit conditions which apply regardless of the Shoreline Master Program.

Shoreline Habitat and Natural Systems Enhancement Projects

- To the maximum extent feasible, the SMP should include provisions to encourage restoration projects, particularly in areas identified as having low function and high potential. Certain fills can be an important component of some restoration projects.

7.1.4 Shoreline Uses

Boating Facilities

- There are no public boating facilities located in the City's shoreline areas upstream of Snoqualmie Falls.
- There is a canoe/kayak put-in area within the FERC project boundary below the Falls.

- There may be an opportunity for non-motorized boating within Borst Lake, depending on results of future water quality assessment.

Industry

- Generally, shoreline master programs must give first preference to water-dependent industrial uses over non-water-dependent industrial uses; and second, give preference to water-related industrial uses over non-water-oriented industrial uses.
- Lands designated for industrial uses should not include shoreline areas with severe environmental limitations, such as Category 1 critical areas and the FEMA floodway
- Lands designated for Industrial Development should be designed and located where no net fill is required and, where applicable, environmental clean-up and restoration can be accomplished as part of new development.

In-stream structures

- As directed by the SMP Guidelines, the location and planning of in-stream structures (i.e. for hydroelectric generation, irrigation, water supply, flood control, transportation, utility service transmission, fish habitat enhancement) shall give due consideration to public interests, watershed functions and processes, environmental concerns and protecting and restoring priority habitat and species.

Recreation

- The SMP should give shoreline riverfront recreational development priority and assure the activities are primarily related to access and enjoyment of the water and shoreline area.
- In addition to emphasizing water-oriented recreational uses, appropriate limits should be established for non-water oriented activities and facilities, such as the proximity and location of parking areas and ball fields.
- Policies and regulations that address the development of active facilities should ensure that the development of such facilities result in no net loss of ecological function. Regulations should address upland concerns, such as the location of parking facilities and active play areas, as well as the development of nearshore structures.

Residential Development

- Further residential development in the shoreline area will be minimal because the area is located in the floodway/floodplain. Management should be focused towards acquisition of floodprone riverfront properties in the floodway; elevation of existing homes; and limited higher-density redevelopment in floodplain areas near the historic downtown core.
- The SMP should include provisions which address shoreline armoring, storm water runoff, septic systems, introduction of pollutants and vegetation modification and removal. The SMP should address existing residential areas of the shoreline management area that are not connected to sewer.

Commercial Development

- Generally, the SMP must give preference to water-dependent commercial uses over non-water dependent commercial uses; and second, give preference to water-related and water-enjoyment commercial uses over non-water oriented commercial uses.
- The SMP should allow for visual and physical public access to the Snoqualmie River within the historic downtown commercial area to promote water-oriented uses.

7.2 RESTORATION PLAN

The Restoration Plan should be prepared consistent with 173-26-201(2) (f) (i-vi) by addressing the following six subjects:

- Identify degraded areas, impaired ecological functions, and sites with potential for ecological restoration;
- Establish overall goals and priorities for restoration of degraded areas and impaired ecological functions;
- Identify existing and ongoing projects and programs that are currently being implemented, or are reasonably assured of being implemented (based on an evaluation of funding likely in the foreseeable future), which are designed to contribute to local restoration goals;
- Identify additional projects and programs needed to achieve local restoration goals, and implementation strategies including identifying prospective funding sources for those projects and programs;
- Identify timelines and benchmarks for implementing restoration projects and programs and achieving local restoration goals; and
- Provide for mechanisms or strategies to ensure that restoration projects and programs will be implemented according to plans and to appropriately review the effectiveness of the projects and programs in meeting the overall restoration goals.

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APPENDIX A

Information Request Letter and Distribution List

APPENDIX B

Photographs

APPENDIX C

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APPENDIX D

Ecological Processes and Performance of Functions