

## ***CHAPTER 2: CRITICAL AREAS ELEMENT***

### **A. Introduction**

### **B. Water and Related Resources**

B.1 Drainage Basin

B.2 Water Quality and Quantity

B.3 Critical Aquifer Recharge Areas

B.4 River and Stream Corridors

B.5 Frequently Flooded Areas

B.6 Channel Migration

B.7 Wetlands

### **C. Fish and Wildlife Habitat**

### **D. Geologically Hazardous Areas**

D.1 Erosion Hazards

D.2 Landslide and Steep Slope Hazard Areas

D.3 Seismic Hazards

### **E. Air Quality and Other Environmental Issues**

### **F. Critical Area Map Series (adopted by reference)**

## ***CHAPTER 2: CRITICAL AREAS ELEMENT***



### **A. INTRODUCTION**

A significant part of the quality of life in North Bend and the Upper Snoqualmie Valley lies in the area's abundance of dominant natural features. The geology, hydrology, flora and fauna systems characteristic of the area are intricately connected components of the natural environment. A disturbance in one system can have direct or indirect effects on the others, including the human system.

The quality of life experienced by city residents and visitors is directly associated with the quality of the environment. North Bend has historically been attractive to live in because of the high-quality natural environment: clean air and water, lush forest areas, and a beautiful physical setting. Protection of these elements is essential if residents are to maintain their healthy lifestyle. Conversely, the contamination or reduction of these resources where people reside, and work negatively impacts the quality of life fundamental to the very reasons that people choose to live here.

King County Countywide Policies (CWP) were updated on December 21, 2021, under Ordinance 19384, and ratified on April 6, 2022. The full list of the 2021 CWP is available on King County's website.

The environment-related goals and policies in the 2021 CWP now include Environmental Sustainability (EN-1 through EN-5), Earth and Habitat (EN-6 through EN-11), Flood Hazards (EN-12 through EN-14), Water Resources (EN-15 through EN-19), Open Space (EN-20 through EN-22), Restoration and Pollution (EN-23 through EN-26), Climate Change (EN-27 through EN-33). The City's Comprehensive Plan appears consistent with 2021 CWPP.

The overarching Environment Goal of the CWP is to restore and protect the quality of the natural environment in King County for future generations. The vision for King County 2050 is characterized by Protected Critical Areas providing beneficial functions and values for reducing flooding, protecting water quality, supporting biodiversity, and enriching our quality of life for future generations as the region's population continues to grow.

Together, North Bend's Vision Statement and the King County Countywide Policies (CWP) guide this Critical Areas Element.

## **Growth Management Detail**

The Growth Management Act calls upon local government to protect the environment and enhance the state's high quality of life including air and water quality and the availability of water. To implement this goal the GMA required local governments to protect critical areas and ecosystems.

In designating and protecting critical areas cities shall include the best available science when preparing policies and development regulations to protect the functions and values of critical areas. In addition, cities shall give special consideration to conservation or protection measures necessary to preserve or enhance anadromous fisheries. Pursuant to GMA wetlands regulated under development regulations shall be delineated in accordance with the wetland manual adopted pursuant to RCW [90.58.380](#).

In addition to the GMA mandate to protect critical areas there are related State mandates to evaluate the impacts of policy decisions or actions that could have a significant impact on the environment under the State Environmental Policy Act (SEPA), to protect the shoreline environment in the Shoreline Management Act (SMA) and various directives to protect surface water and ground water. These state mandates have companion federal mandates to achieve similar goals for federally funded actions or projects occurring on federal lands. Finally, at the federal level, there is a mandate to protect threatened or endangered species of animals through the Endangered Species Act (ESA). The North Bend area is known as a contributing environment for two threatened species including in the Chinook salmon (water quality and quantity in the Snoqualmie River only) and the Bull Trout, though none have been found in the immediate North Bend area.

The State and Federal environmental protection mandates give clear direction to guide the policy actions the City must take to protect the environment. Natural features which represent limitations to the scope or scale of physical development that can occur within North Bend and its UGA are critical areas which include:

### **Water and Related Resources:**

- River and Stream Corridors
- Frequently Flooded Areas
- Channel Migration areas
- Wetlands
- Aquifer Recharge Areas
- Wellhead Protection Areas

### **Fish and Wildlife Habitat Areas**

### **Geologically Hazardous Areas:**

- Erosion Hazards
- Landslide and Steep Slope Hazards
- Seismic Hazard Areas

While this chapter contains policies intended to protect critical areas in North Bend and influence the protection of areas outside local control, these policies recognize the qualitative differences between various critical areas and the fact that not all areas are constrained for the same reasons. Some are critical because of the hazard they present to public health and safety. Others are critical because of the intrinsic values they represent to the welfare of the North Bend community and/or the region. In some cases, the risk posed to the public, natural system or natural process by the use or development of a critical area can be mitigated or reduced by engineering or site design. In other cases, the risk or impact potential cannot be effectively reduced except by avoiding development within the critical area.

This chapter's intent is to assure long term sustenance of natural features and processes by limiting development in areas where it may interrupt or degrade natural ecological functions and values, subject persons and property to unsafe or hazardous conditions, or affect the perceived quality of life in the North Bend community. Sustainable management of North Bend's environmentally critical areas is considered a high priority action to successfully implement the Comprehensive Plan.

**Goal 1: Use Best Available Science (BAS) as defined by the Growth Management Act to define and protect Critical Areas**

**Policies:**

- 1.1 Collect and evaluate BAS to identify the appropriate level of protection for critical areas.
- 1.2 Recognize limitations on critical area function and value created by existing development and design critical area regulations to provide optimal protection to the remaining higher value critical areas, including areas where high value functions can be restored.
- 1.3 Utilize the risk assessment method prescribed by the GMA to evaluate the potential impact of not using BAS to protect critical areas where it is determined to be unfeasible to fully protect the functions and values because of existing development patterns.
- 1.4 Evaluate state and federal protection mandates when developing local critical area protection and land use development regulations.

**B. WATER AND RELATED RESOURCES**

Water is a powerful physical and chemical force, whose movement can shape the form and function of the landscape. Heavy rains typical of the Northwest, and North Bend in particular, can scour out river and stream channels, inundate valley floodplains, and flood wetlands. Soil and loose material picked up in one area is often transported by rivers, streams, and floods and deposited to other parts of the Snoqualmie Valley, and ultimately to Puget Sound. Likewise, chemicals dissolved in rainwater are carried to wetlands, over floodplains and downstream. Both

surface runoff and groundwater flows of water may combine to create landslides or other earth movement that further alters the physical environment and poses hazards to people and property.

As development occurs, native vegetation and absorbent topsoils are removed, land becomes compacted and paved, and existing site topography is changed. Such landscape changes can alter the way water moves, add to existing hazards associated with natural drainage systems and affect the habitat, recreational, and scenic value of water resources.

### **B.1 Drainage Basin**

The South and Middle Forks of the Snoqualmie River and its tributaries are the dominant watercourses in the North Bend area. Originating from the western slopes of the Cascades, the Middle Fork drains 171 square miles and the South Fork drains 85 square miles for a total of 256 square miles.

### **B.2 Water Quality and Quantity**

In addition to contributing significantly to the area's natural beauty and quality of life, the rivers, streams, and wetlands in the Upper Snoqualmie Valley store, purify, and convey surface waters. Stormwater runoff is a significant contributor to water pollution in urbanized areas. Development of homes, farms, and businesses may result in runoff that pollutes these surface waters and groundwater and threatens habitat, recreation value, and/or drinking water supplies. Sedimentation from ground disturbed by grading, construction, farming, and logging can reduce river or stream channel capacity, fill wetlands, and destroy aquatic life and habitat. Surface water runoff from developed areas can carry pollutants such as oils, heavy metals, fertilizers, and pesticides into streams. Changes caused by development can alter or reduce the quantity of water in the ground, streams and rivers. Protection of both water quality and quantity is important to protect fish habitat and provide adequate supplies of potable drinking water. The City has adopted stormwater management regulations and a stormwater utility to implement state and federal stormwater protection standards. Low impact development approaches for managing stormwater and protecting water quality are a critical component of the stormwater standards.

### **Regional Groundwater Protection Planning**

Guidance for aquifers notes that the city is required to implement the East King County Ground Water Management Plan per WAC 173-100-120 and directs a series of actions to implement the plans. In April 1990, the Department of Ecology designated East King County, including the North Bend planning area, as Groundwater Management Area No. 14, pursuant to RCW 90.44. The designation authorized King County to develop a Groundwater Management Plan (GWMP) for the area. The GWMP process was overseen by a Groundwater Advisory Committee and included representatives of cities, health agencies, state and federal agencies, and public and special interest groups. The City of North Bend participated as a member of the Advisory Committee.

The first phase of the GWMP process included reviewing technical studies of existing groundwater resources in the area. The U.S. Geological Survey had recently completed a comprehensive inventory of 600-800 wells in the area was conducted to identify aquifers and other geologic features. Of those wells, approximately 150 were sampled for a variety of water

quality data. The East King County Groundwater Advisory Committee continued the monitoring of the technical studies to develop the Groundwater Management Plan. The East King County Ground Water Management Plan was completed by the East King County Ground Water Advisory Committee in December 1998 then subsequently approved by the King County Council and certified by the Washington Department of Ecology in 2000. In 2001, the King County Council has passed an ordinance establishing a new East King County Ground Water Management Committee for three years. The East King County Groundwater Management Committee monitored progress made under the plan, charted out subsequent groundwater protection efforts and reviewed / revised the plan as necessary. The East King County Groundwater Management Committee did not renew their charter within the county code and became inactive by 2005.

### **Recharge Areas - Susceptibility and Vulnerability**

The Growth Management Act requires cities to classify aquifer recharge areas according to vulnerability. Vulnerability is the combined effect of the (1) hydrogeological susceptibility to contamination and (2) the potential for contamination. A highly vulnerable recharge area would be one where land uses could contribute contamination that might degrade groundwater quality, and hydro geologic conditions (e.g. very porous, well drained soils) that facilitate such contamination. Low vulnerability is indicated by land uses that do not contribute contaminants that will degrade groundwater, and susceptibility conditions that do not facilitate degradation.

The susceptibility of a recharge area to contamination is a function of several physical characteristics including but not limited to: depth to groundwater, aquifer properties such as hydraulic conductivity and gradients and soil structure. Factors relevant to the contaminant loading potential side of the vulnerability equation include general land use, waste disposal sites and practices, and agricultural activities.

The potential for contamination includes a number of factors such as the amount of contaminant present, toxicity, mobility and persistence.

Classification, identification and regulation of critical aquifer recharge areas in the North Bend and the surrounding area will be founded on the available technical studies completed by the City of North Bend and Groundwater Protection Program through the East King County Groundwater Management Committee process. See the policies regarding aquifer recharge areas are general concerns relative to long term protection of groundwater resources below.

### **B.3 Critical Aquifer Recharge Areas**

Under the GMA, the City is required to create a Critical Aquifer Recharge Area (CARA) designation and apply city regulations to protect the aquifer consistent with the East King County Ground Water Management Plan.

Groundwater is an important source of domestic water supply for the North Bend planning area. It is contained in underground aquifers and delivered through such means as springs and wells. Most aquifers are replenished, or recharged, by rainwater. Development can threaten the quantity as well as quality of groundwater by contamination and reducing recharge. Preventing

contamination is necessary to avoid potential risks to public health, significant costs, and hardship. The quality of groundwater in an aquifer is directly linked to its recharge area. Intensive development can deplete groundwater or seriously threaten groundwater quality if not properly managed. North Bend's ability to identify the potential impacts to groundwater from new or existing development and recommend mitigating measures depends on the quality of data available on local groundwater resources.

Groundwater management plans have been developed for the county, including the North Bend UGA. The protection of groundwater requires an understanding of (1) the quantity of water replenishing aquifers relative to the quantity being withdrawn from them, and (2) the potential for contamination. These issues are functions of related, but different factors and cannot adequately be addressed by the same designation. The areas highly susceptible to groundwater contamination are mapped and updated by the city. Wellhead protection studies provide additional information about contamination susceptibility and vulnerability of water purveyor's wells. They also increase understanding of where the wells are being recharged. The City of North Bend will update their Wellhead Protection Plan and Critical Aquifer Recharge Areas as required and necessary.

**Goal 2:            Maintain the long-term quality of groundwater resources in North Bend and its growth area by prevention of contamination.**

**Policies:**

- 2.1     Protect critical groundwater recharge and wellhead protection areas, and develop planning and regulatory measures to ensure that groundwater resources are protected from potential pollution.
- 2.2     The City of North Bend shall implement goals and policies outlined in the East King County Groundwater Management Plan as required per WAC 173-100-120.
- 2.3     Take corrective action for failing septic systems by requiring failed systems to hook up to the City sewer system consistent with NBMC.
- 2.4     Require filing with the City of a hazardous materials emergency plan for industries identified as using, transporting, or storing known hazardous materials.
- 2.5     Continue to work with other governmental agencies to identify and control the use of hazardous materials in aquifer recharge areas and wellhead protection areas.
- 2.6     Provide education and technical assistance on the use of pesticides and fertilizers to homeowners and businesses in North Bend.
- 2.7     Implement land use regulations that prohibit uses that pose a significant threat to contamination of a groundwater aquifer in areas defined as high susceptibility wellhead protection and aquifer recharge areas.

- 2.8 Work cooperatively with State, County and environmental resources to identify and develop strategies to clean up contaminated properties (brownfields) that present a threat to groundwater quality or redevelopment of the contaminated properties.

#### **B.4 River and Stream Corridors**

The City of North Bend is located upstream from Snoqualmie Falls, which functions as a barrier to the upstream migration of anadromous fish. However, the Snoqualmie River above Snoqualmie Falls with its three main branches and its many tributaries provide valuable habitat to resident fish species. **Figure 3 of the Critical Area Map Series** depicts streams within the North Bend Planning Area.

Natural drainage systems provide important and beneficial functions including storing and regulating stormwater flow, purifying surface water, recharging groundwater, conveying water, providing important aquatic habitat and supporting important biological activities. Alteration of natural drainage systems results in public costs and can disrupt natural processes, leading to environmental degradation including flooding, erosion, sedimentation, and damage to infrastructure, water quality and habitat.

The most effective solution for protecting natural drainage systems and water quality is to control the amount and quality of surface water runoff. New development can be designed to prevent significant runoff and water quality problems, protect the integrity of natural channels, preserve the habitat functions and values of riparian corridors, and maintain the scenic character provided by local watercourses. North Bend Goals and Policies for Regulated Shoreline Environments are contained in the Shoreline Element of the Comprehensive Plan.

**Goal 3: Protect the natural hydraulic, hydrologic and habitat functions, scenic as well as recreational values of streams.**

#### **Policies:**

- 3.1 Control the quality and quantity of stormwater runoff to protect natural drainage systems. New development should not increase peak stormwater flows.
- 3.2 Require mitigation measures on all public improvements and private development which proposes to alter natural drainage systems.
- 3.3 Ensure the implementation of Best Management and Low Impact Development Practices to reduce the impacts of construction and construction-related activities that may affect streams.
- 3.4 Minimize stream crossings; where authorized, stream crossing should consist of bridges rather than culverts.
- 3.5 Evaluate state and federal stream habitat protection mandates when developing local critical area protection and land use development regulations.



- 3.6 Utilize restoration guidance manuals such as the Stream Habitat Restoration Guidelines or Water Crossing Design Guidelines prepared by WDFW and other State agencies, or as updated for projects in the City of North Bend.
- 3.7 Implement best management practices for the treatment of wastewater that removes the river as the primary and secondary discharge point while accommodating target growth.
- 3.8 Discharge from the Wastewater Treatment Plant shall meet or exceed Department of Ecology Class A standards.

### **B.5 Frequently Flooded Areas**

Flooding is a natural geologic process which has shaped the Upper Snoqualmie Valley, providing habitat for wildlife, and creating rich agricultural lands. Human development often interferes with the natural processes of floodplains, affecting the distribution and timing of drainage and resulting in inconvenience or catastrophe. Flood problems can increase as human activities encroach upon floodplains.

North Bend is located on the floor of the Upper Snoqualmie Valley, upstream of Snoqualmie Falls and near the confluence of the three forks of the Snoqualmie River. Upstream of North Bend and this confluence is a river basin with an area of approximately 256 square miles. A combination of high annual precipitation and melting snow in the Upper Snoqualmie Basin contribute to the potential for significant winter flooding from November through February. Rivers that carry runoff out of the upper basin are constricted downstream and collect on the flat valley floor where North Bend is located. Although incorporated North Bend with its developed areas occupy a very small percentage of the entire river basin, its location on the valley floor close to the outlet of the basin makes it vulnerable to flooding, which can damage residences or other property.

Flooding of lowland areas by excessive stormwater runoff and snowmelt is one of North Bend's most common and costly natural hazards. The built environment also creates localized flooding problems outside of natural floodplains by altering and confining historic drainage channels, thereby reducing their capacity to contain flows. Flooding has been part of the history of North Bend and the entire Snoqualmie Valley. High flow events occurred in 1932, 1933, 1943, 1947, 1951, 1959, 1964, 1975, 1986, 1989, 1990, 1995, and 1996, 2006, 2009, 2011 and 2015 in the Valley. North Bend flood hazard areas are defined by the Federal Emergency Management Agency (FEMA) as those areas subject to inundation by the 100-year flood (i.e. the 100-year floodplain). The 100-year floodplain is that area that has at least a 1 percent probability of inundation in any given year. Streams, lakes, wetlands, and closed depressions all have floodplains that may also qualify as flood hazard areas. The Critical Area Map Series depicts flood hazard areas within the North Bend planning area. The goal and related policies of this plan provide guidance in protecting the public from flood hazard and at the same time protect the environment by discouraging development within flood areas. Primary planning policies and implementation measures to reduce the hazards of flooding in North Bend are provided in the North Bend Floodplain Management Plan.

**Goal 4:            Protect public safety by discouraging development within the river floodway and its natural systems and by preserving the flood storage function of floodplains.**

**Policies:**

- 4.1     Reserve flood hazard areas for less-intensive activities such as public open space and recreation. Uses permitted in the regulated flood areas shall not change flood elevation or obstruct or divert the natural flow.
- 4.2     Support non-structural methods for flood prevention and flood damage reduction measures that do not increase upstream or downstream flooding.
- 4.3     Prohibit construction of permanent structures in the floodway (FEMA).
- 4.4     Locate roads at grade level and build structures at least one foot above the 100 year flood elevation to maintain existing flood storage capacity where development is allowed in the floodplain.
- 4.5     Work with the City of Snoqualmie, King County and the Snoqualmie Watershed Forum to establish criteria for joint review of significant projects which may have flood related issues.
- 4.6     Preserve the natural functions of drainage systems, including vegetation and channel corridors, and control runoff from new development in terms of peak flows, total quantity and location of discharge.
- 4.7     Review and revise the policies relating to flood protection as necessary for consistency with the North Bend Floodplain Management Plan.

**B.6 Channel Migration**

The upper Snoqualmie River and its three forks, near the City of North Bend, is one of several rapidly migrating river systems in King County. These rivers have a tendency to move large distances across the floodplain in a short period, sometimes during a single flood. Channel migration hazard areas are not shown on Federal Emergency Management Agency (FEMA) flood insurance maps, which only show areas subject to inundation. The FEMA maps are used by regulatory agencies, landowners, and developers to determine where development can be allowed along rivers. The City of North Bend has approved zoning for potential residential development in accordance with flood insurance maps in areas where a change of river course has been mapped by King County. In many cases, landowners buy the property with little awareness of the potential hazard from bank erosion. An additional complication arises because FEMA maps are based on fixed base hydraulic analyses. Because of channel migration, the floodplain and floodway boundaries shown on the maps are in some cases only reliable for short periods after the maps are completed.

King County's historic approach to bank erosion problems has been to try to control rivers through extensive construction of levees and revetments. However, few new projects of this type have been built since the 1970's, due to lack of funds and the adverse effects of these projects on flooding and aquatic habitat. Projects that have been constructed more recently tend to protect specific small areas such as roads or houses. Levees and revetments are expensive to build and maintain, can aggravate flooding or erosion problems off-site, and are subject to failure due to channel migration upstream or downstream from the project. Traditional rock levees and revetments have degraded in-stream and riparian habitats by eliminating side channels and riparian vegetation and reducing recruitment of gravels and woody debris into rivers.

In order to regulate development in hazardous zones along rapidly migrating rivers, the King County Flood Hazard Reduction Plan recommended conducting channel migration hazard mapping and studies. The 1996 report on Channel Migration in the Three Forks of the Snoqualmie River report is a result of such a study. The study includes a determination of historic limits and rates of channel migration, estimation of probable future limits of channel migration, and development of maps that show channel migration hazard zones. Hazard maps produced by these studies have been adopted by King County to use in regulating development under the Critical Areas Code.

The Three Forks of the Snoqualmie River report covers the upper Snoqualmie River mainstream from Snoqualmie Falls upstream to the confluence of the three river forks of the Snoqualmie, and each river fork upstream to a stable section of the channel. Within the study area, levees, and revetments (rock-armored banks) are discontinuous and subject to damage by channel migration upstream or downstream of the armored site. On the South Fork Snoqualmie River upstream from the Burlington Northern right-of-way in North Bend, channel migration has been effectively prevented for 30 years by channelization of the river between narrowly spaced levees. Although the levee system requires frequent maintenance due to toe scour (Shannon & Wilson, 1993; King County, 1993), the channel is not expected to migrate. Little channel migration occurs on the north Fork upstream from Ernie's Grove or on the Middle Fork upstream from Tanner, where the channels are relatively steep and stable. However, downstream from Tanner on the Middle Fork and north of the Snoqualmie Valley Trail (old Milwaukee railroad) on the South Fork, the river has potential to migrate in conjunction with a flood event placing portions of the Silver Creek Neighborhood at risk for an avulsion channel migration.

CMZs refer to a river's likely lateral movement, based on evidence of active movement over the past. North Bend's CMZs have been mapped by King County depicting areas of potential, moderate and severe hazard for channel migration. The goal and related policies of this plan provide guidance in protecting the public from flood hazard and at the same time protect the environment by discouraging development within flood prone areas, including channel migration or avulsion areas. The Critical Area Map Series shows the North Bend UGA River Channel Migration Hazards.

## **B.7 Wetlands**

Wetlands are defined as those areas that are inundated or saturated by ground or surface water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands include marshes, swamps, bogs, and similar areas. They occur both in association with rivers, streams, lakes or ponds, and as isolated wetlands which exist due to saturated soil conditions. Wetlands are classified into various types. Each type has its own characteristics and related development constraints. Wetlands located in the 100-year floodplain are part of the “shoreline” environment regulated under the State Shoreline Management Act and also receive Federal protection from the US Army Corps of Engineers.

### **Historical Wetland Detail**

Wetlands are a valuable natural resource, which serve many important ecological and social functions. Wetlands are among the most productive biological systems for they provide important habitat for fish and wildlife, including essential nesting, feeding, breeding, and hiding places. Because of the rich biological environment they contain, wetlands provide unique educational and scientific research opportunities. An important quality of wetlands is their value as a scenic resource, providing pleasant visual contrast to manage forest uplands, agricultural lands, and developed areas. In addition, wetlands provide recreational and educational opportunities. Wetlands also improve water quality by filtering out sediments, excess nutrients, and toxic chemicals. They can support agricultural activities and provide a rearing habitat for fish. Wetland vegetation can help stabilize shorelines and effectively reduce stream bank erosion from river currents. In many cases, wetlands help recharge groundwater supplies and maintain stream flows. Finally, they play an important role in flood reduction by slowing and storing flood waters.

Wetland preservation and protection can significantly reduce public and private costs associated with downstream flooding, poor water quality, and diminishing wildlife habitat. North Bend has recognized the value of natural wetlands. The city has mapped probable wetland areas within the planning area using a 1991 survey of “potential wetlands” using aerial photography and U.S. Soil Conservation Service Soil Survey maps, site specific data from projects on delineated wetlands, and the King County mapped wetlands. The Critical Area Map Series depicts wetland resource areas within the North Bend planning area. Since the scale of this map does not allow the depiction of all wetlands, the North Bend Wetlands Inventory Map should be consulted for additional detail.

**Goal 5:                Preserve, protect, restore and enhance wetlands for their hydraulic, ecological, visual and cultural values.**

#### **Policies:**

- 5.1      Encourage no net loss of remaining wetlands acreage, functions and values within the North Bend and its UGA.
- 5.2      Encourage the creation and restoration of wetlands to increase the quantity and quality of wetlands in North Bend.
- 5.3      Protect and buffer wetland functions from significant human impact.

- 5.4 Allow for and incorporate public access to wetlands in development plans when the city determines such access will not degrade the resource and is desirable for establishing interpretive facilities and/or providing links to existing or proposed parks, open space or scenic areas.
- 5.5 Maintain the natural hydrology to wetlands while identifying methods to remove potentially harmful contaminants from stormwater discharge.
- 5.6 Promote the use of property tax reductions, conservation easements and other techniques as incentives to preserve wetlands as a public benefit.
- 5.7 Mitigation projects requiring the replacement of wetlands functions and values should, when feasible, contribute to existing wetland system or restore an area that was historically a wetland in accordance with the most recent federal and state interagency guidance or as amended. The interagency mitigation guidance manual was updated in 2021, available on Department of Ecology's website. Wetland mitigation banking within our watershed may be allowed.
- 5.8 Design critical area regulations to recognize limitations on wetland function, value and habitat created by existing development and focus greater protection to the remaining higher value wetland habitat areas.
- 5.9 Evaluate the effect of state and federal wetland protection mandates when developing local critical area protection and land use development regulations.

### **C. FISH AND WILDLIFE HABITAT**

The natural environment plays an important role in the health of the entire ecosystem and the overall high quality of life found in North Bend. The preservation of critical areas for habitat use is critical in sustaining wildlife and in retaining the City's rural character. Wildlife habitat areas associated with streams and wetlands and their buffers can be protected by regulations and enhanced by innovative and critical site design. The preservation of wildlife habitat and priority species with jurisdictional goals, policies, and regulations is mandated by the Growth Management Act. The development of the Critical Areas plan element for the protection and integration of wildlife habitat in the City of North Bend relates to various issues in regard to wildlife and its recognized importance to the city and its citizens. This plan includes goals and policies to provide guidance for integrating the needs of wildlife and protecting wildlife habitat as well as respecting property owner's rights.

**Goal 6: Strive to protect and enhance wildlife habitat areas within the City and its UGA.**

**Policies:**

- 6.1 Work with the state and county to identify, protect, and enhance important wildlife corridors within North Bend and its surrounding area to create a network of wildlife corridors which link habitat areas together to encourage the natural movement of plant and animal species.
- 6.2 Encourage community involvement and education in the creation, enhancement, management, interpretation and enjoyment of wildlife habitat areas.
- 6.3 Encourage access to sites of wildlife interest when not in conflict with wildlife protection goals.
- 6.4 Support and encourage the development of nature conservation programs within the Snoqualmie Valley School District.
- 6.5 Work with other agencies to develop a comprehensive fish and wildlife habitat and management plan for North Bend and its UGA.
- 6.6 Work with the Snoqualmie Watershed Forum and other stakeholders to develop and implement measures to preserve and restore protected fish populations in the Snoqualmie Watershed consistent with the WRIA 7 Salmon Recovery Plan, Near Term Action Agenda, and similar basin-wide action plans for salmon recovery.
- 6.7 Apply for restoration grants to ensure that the quality of the natural environment and its contribution to human health and vitality are sustained now and for future generations.

### **Regional and National Environmental Compliance**

The City of North Bend works closely with federal and state agencies, cities, and other counties to integrate and streamline compliance with federal mandates like the Clean Water Act, Clean Air Act, and Endangered Species Act (ESA). The City will also work with the Snoqualmie Watershed Forum and the Puget Sound Partnership to define and implement measures to protect habitats identified by WDFW. Programmatic actions taken in conjunction with the Watershed Forum to date include development of the Near Term Action Agenda (NTAA) to protect Chinook Salmon, participation in development of the Long Term Salmon Conservation Plan for Chinook Salmon completed in 2004 and development of the joint Model Critical Area Protection Ordinance to incorporate the applicable recommendations of the NTAA and “Best Available Science” as defined by the GMA. Capital projects to date include acquisition and restoration of significant critical areas on the Tollgate and Meadowbrook Farms. Storm drainage projects outlined in the Capital Improvement Plan will improve storm drainage, water quality and habitat. The Puget Sound Partnership was created by the Washington State Legislature and Governor in July 2007 to achieve salmon recovery. The Partnership's goal is to consolidate and significantly strengthen the federal, state, local, and private efforts undertaken to date to protect and restore the health of Puget Sound and its watersheds. The City’s 2018 Critical Areas Ordinance or as amended reflects the “Best available Science” for fish and wildlife habitat protection.

## **D. GEOLOGICALLY HAZARDOUS AREAS**

Geologically hazardous areas are defined by WAC 365-190-120 as “erosion; landslide hazards; seismic hazards; volcanoes; tsunamis; areas subject to other geological events such as coal mine hazards and volcanic hazards, including: mass wasting, debris flows, rock falls, and differential settlement. Seismic hazard areas must include areas subject to severe risk of damage as a result of earthquake induced ground shaking, slope failure, settlement or subsidence, soil liquefaction, surface faulting, or tsunamis.”

A number of geologic hazards exist within the vicinity of North Bend. For example, landslide and erosion hazards are common in hillside areas with steep and unstable slopes. In addition, these lands are at great risk in the event of an earthquake. Regulations include, at a minimum, provisions for vegetation retention, seasonal clearing and grading limits, setbacks, and drainage and erosion controls.

To address geologic hazards jurisdictions shall regulate development on lands with:

- a. Slopes with a grade greater than 40 percent;
- b. Severe landslide hazard areas;
- c. Erosion hazard areas;
- d. Mine hazard areas; and
- e. Seismic hazards.

### **D.1 Erosion Hazards**

Erosion is a natural process of the wearing away of land surfaces by water, wind and ice. While erosion and sedimentation are natural processes at work in the landscape, they are frequently accelerated by land use modifications and urban development.

The susceptibility of soil to surface erosion depends on its physical and chemical characteristics, slope, vegetative cover, the intensity of rainfall, and runoff velocity. Eroded material is moved by surface flows and deposited elsewhere as sediment. The negative effects of increased sedimentation are most pronounced where erosion of soils is connected to the surface drainage network. Through sedimentation, soil erosion can result in degradation of surface water quality and/or aquatic habitats.

The Critical Area Map Series depicts Erosion and Debris Flow, depicts areas of potential landslide hazard within North Bend and its surrounding area. The map shows areas where soils are particularly susceptible to increased erosion as a result of development. It is important to note that while the map does not show any areas within the city which are characterized by erosion hazards, these conditions do exist here on a site specific or local scale. Soils mapped include those which may experience severe to very severe erosion (soil particle movement) according to the USDA Soil Conservation Service. This definition is consistent with erosion hazard areas as designated in the King County Critical Areas Ordinance and meets the minimum guidelines for erosion hazard areas outlined in the Growth Management Act.

**Goal 7:           Protect people, property, water quality and habitat from the negative effects of accelerated erosion and sedimentation.**

**Policies:**

- 7.1 Work with property owners to restore vegetative cover and natural drainage features on identified degraded sites where degradation has led to accelerated erosion and sedimentation.
- 7.2 Work with the County to restrict the scope and scale of development in erosion hazard areas which impact the city and its growth area.
- 7.3 Seek to retain as open space those areas where the soils have been identified as having severe or very severe erosion potential.
- 7.4 Minimize grading and require the restoration of native vegetation on development sites which are known to have a high probability of erosion.
- 7.5 Ensure the implementation of Best Management Practices to reduce the impacts of construction and construction-related activities by utilizing WDFW's Integrated Streambank Protection Guidelines (2002 or as amended).
- 7.6 Ensure usage of proper sedimentation controls and staged clearing and grading to minimize impacts to soil, understory vegetation or downslope conditions through permits and inspections of development sites.

**D.2 Landslide and Steep Slopes Hazard Areas**

These critical areas can include: Erosion hazard areas, landslide hazard areas, seismic hazard areas, and local geological events. The identification of these geologic hazard areas is necessary for informed land use planning and to support land development regulations which reduce the risk of property damage, personal injury, and environmental degradation. Landslide hazard areas lie principally outside the existing city limits but are evident in areas surrounding the City. Landslide flow paths however can directly impact the incorporated city. Landslide hazard areas are defined by alternate or co-existing landscape conditions, which are based on well-established geotechnical determinations of slope stability and considerable experience and research in the Puget Sound area. Earthquakes in the past have caused large rocks and boulders to fall from Mt. Si in 1949 and 2008.

The stability of slopes in landslide hazard areas is highly dependent on the water content of the underlying soils. Water readily percolates through sand and gravel, but ponds above less permeable silt, clay and till layers, thus saturating the overlying deposits. Where a less permeable layer (silt or clay) intersects a slope, water often seeps from the layers above. This combination of sedimentary deposits, topography, and local groundwater flow results in a high potential for landslides. An event that increases groundwater levels and flow, such as a rainstorm or discharge of surface water above a slope, can saturate sediments near the surface and cause failure of a slope that is stable under dryer conditions. Likewise, erosion along a stream channel can steepen a slope



or expose deposits which may become water saturated, increasing the potential for landslides on a previously stable slope.

Most landslide hazard areas outside of the City of North Bend involve a few feet of relatively loose soil on slopes underlain by denser and typically less permeable till or bedrock. All areas with surface soils underlain with relatively impermeable soils on slopes of 15 percent or greater and with drainage from topographically higher areas, and all areas with steep slopes greater than 40 percent (except consolidated rock), are depicted in the Critical Area Map Series available on the City's website. These unstable slopes represent a major hazard to people and structures and have limited development potential. The plan's goal and policies provide guidance in decreasing the hazards of developing within landslide hazard and steep slope areas.

**Goal 8:            Avoid development in identified hazard areas to protect people and property from the risk and negative effects of unstable slopes and landslide hazards.**

**Policies:**

- 8.1      Encourage use of landslide hazard areas and their alluvial fans as open space and maintain such sites in their natural condition, including preservation of vegetation.
- 8.2      Permit developments in landslide hazard areas only if it can be shown that it development not decrease slope stability, or the hazard can be eliminated or mitigated.
- 8.3      Seek to retain areas with slopes in excess of 40 percent as open space areas in order to protect against geologic hazards.
- 8.4      Work with the County in order to restrict development in landslide hazard areas and their flow paths.

**D.3 Seismic Hazards**

Seismic hazard areas are defined as those areas subject to severe risk of earthquake damage as a result of seismically induced settlement or soil liquefaction. Loose, water-saturated soils tend to experience the most severe ground shaking during an earthquake. When shaken by an earthquake, such soils lose their ability to support a load; some soils will actually flow like a fluid. Loss of soil strength can result in failure of the ground surface (settlement, surface cracking, and landslides) and damage to structures. Most of the floor of the upper Snoqualmie Valley has been identified as a seismic hazard area.

Since the entire valley floor is a seismic hazard area it is unreasonable to restrict remaining undeveloped valley properties to agricultural or open space uses for seismic safety purposes. However, land use planning strategies and building code regulations can be used to reduce the health and safety risk due to seismic hazards in hillside areas where landslides and rock fall are possible. It is essential for the city to have an earthquake disaster response plan as part of the emergency response plan. This plan designates specific responsibilities to various city officials in the event a significant earthquake occurs and would outline the relationship between the City's

disaster preparedness plan and other jurisdictional disaster response plans. The plan was developed in 2023 and is on file with the city.

**Goal 9: North Bend seeks to diminish the risks to human life and property associated with earthquake activity in the Puget Sound Region.**

**Policies:**

- 9.1 Maintain and enforce the latest seismic standards within the City's building codes.
- 9.2 Work with the County to develop informational materials for property owners and occupants about seismic hazards.
- 9.3 Require additional setbacks for new buildings which lie below steep hillsides critical to earthquake-related subsidence, rockfall hazards or which lie in the path of potential landslides.
- 9.4 Maintain and update the City of North Bend's disaster emergency response plan.

**E. AIR QUALITY AND OTHER ENVIRONMENTAL ISSUES**

All people contribute to air pollution problems by using automobiles, burning wood in wood stoves, burning yard waste, or numerous other actions. Commercial and industrial operations can also contribute significantly to air quality problems. As the population continues to grow, the city will face an increasing challenge to maintain its air quality.

Quality of life is affected by environmental issues such as noise or light pollution. The city can work with its citizens and other governmental agencies to solve these issues.

Air quality is addressed by development of policies, methodologies and standards that promote regional air quality, in coordination with the Puget Sound Air Pollution Control Agency and the Puget Sound Regional Council.

**Goal 10: Strive for the best available solutions to air quality and other environmental issues.**

**Policies:**

- 10.1 Adopt local regulations to require compliance with applicable state and federal standards for installation and operation woodstoves and fireplaces.
- 10.2 Improve air quality by supporting transportation modes that reduce reliance on Single Occupancy Vehicles (SOVs).
- 10.3 Work to support and promote public information strategies that focus on air quality issues and identifies measures that each person can take to improve air quality.

- 10.4 Continue to provide yard waste recycling and collection events as an alternative to open burning.
- 10.5 Develop and implement idling measures that reduce or prohibit the idling of vehicles, consistent with the Transportation Element and its underlying policies.

## **F. CRITICAL AREA MAPPING**

The Critical Area mapping referenced in this element includes those areas within North Bend and its UGA that are defined as: Special Flood Hazard Area (SFHA), River Channel Migration Hazard, Streams and other Fish and Wildlife Habitat Areas, associated buffers, Wetlands, Critical Aquifer Recharge Area and Seismic Hazards Areas and Erosion, Debris Flow and Landslide Hazards. The purpose of these maps is to identify the potential boundaries of the environmentally critical areas that present severe constraints to development. Additionally other maps may be available through other agencies such as Department of Natural Resources who maintains Geologic Planning page and a WGS Geologic Information Portal which may be accessed from their website.

### **Goal 11: Maintain Critical Area Base Maps**

#### **Policies:**

- 11.1 Use Best Available Science (BAS) as defined by the Growth Management Act to define and protect Critical Areas
- 11.2 Collect and evaluate BAS to identify the appropriate level of protection for critical areas.
- 11.3 Recognize limitations on critical area function and value created by existing development and design critical area regulations to provide optimal protection to the remaining higher value critical areas, including areas where high value functions can be restored.
- 11.4 Utilize the risk assessment method prescribed by the GMA to evaluate the potential impact of not using BAS to protect critical areas where it is determined to be unfeasible to fully protect the functions and values because of existing development patterns.

# ***Chapter 10: Shoreline Element***

## **A. Introduction**

### **A.1 Purpose and Relationship to GMA**

Washington State's citizens voted to approve the Shoreline Management Act (SMA) of 1971 in November 1972. The SMA seeks to provide environmental protection for shorelines, preserve and enhance shoreline public access, and encourage appropriate development that supports water-oriented uses, particularly on shorelines of statewide significance, such as the Middle Fork Snoqualmie River, with a flow greater than 1,000 cubic feet per second (cfs).

A Shoreline Master Program (SMP) contains goals, policies, regulations, and a use map that guide the development of shorelines in accordance with the SMA (RCW 90.58), Washington State Department of Ecology (Ecology) SMP Guidelines (WAC 173-26), and Shoreline Management Permit and Enforcement Procedures (WAC 173-27).

The provisions of this element implement the requirements of the SMA. The City's SMP is integrated with the City's land use regulation system. Consistent with RCW 36.70A.480, the goals and policies contained in this SMP shall be considered an element of the City's comprehensive plan required by the Growth Management Act. All other portions of this SMP, including the use regulations, are considered a part of the City's development regulations required by the Growth Management Act.

### **A.2 Profile of the Shoreline Jurisdiction in North Bend**

In accordance with state law, the jurisdiction of North Bend's SMP encompasses the South Fork Snoqualmie River and the Middle Fork Snoqualmie River; their floodways; land within 200 feet of the ordinary high water mark (OHWM) of these waterways and associated wetlands within the 100-year floodplain. In addition, North Bend has adopted the floodway for plus 200 feet of the floodplain, as mapped by the Federal Emergency Management Agency (FEMA) and shown on the Preliminary FIRM dated November 6, 2010. The North Bend shoreline jurisdiction including the City and its Urban Growth Area (UGA), not including aquatic area, is approximately 647 acres (1.01 square miles) and encompasses approximately 7.96 miles of shoreline. The City is pre-designating shorelines in its unincorporated UGA such that if and when the areas are annexed they would be subject to the City of North Bend's SMP. The Silver Creek area is not considered floodway for shoreline jurisdiction purposes since it was determined to be outside the range of "reasonable regularity" per RCW 90.58.030 (2) (b) floodway definition. A thorough analysis was provided to Ecology and is documented in Appendix A (Assessment of Shoreline Jurisdiction) within the final *Shoreline Analysis Report for the City of North Bend's Shorelines: South Fork and Middle Fork Snoqualmie River*.

Current land uses in the shoreline jurisdiction tend to be public parks/open space, low-density residential, and vacant land. Based upon a review of the North Bend Comprehensive Plan land use designations, most shoreline acres are planned for residential, public, or employment purposes.

## **B. Goals and Policies**

Goals express broad value statements that reflect the City's vision of its shorelines. Goals also provide a framework upon which the more detailed SMP shoreline use environments, policies, regulations, and administrative procedures are based in subsequent chapters. Policies are more detailed statements reflecting the City's vision for its shorelines. Policies provide detail to the broader goals with which they are associated and act as a bridge between the goals and implementing regulations.

The goals and policies of the SMP described in this element are categorized according to the Master Program elements mandated in the SMA. The general goal and policy statements found within each element of the Master Program are intended to provide the policy basis for administration of the City's SMP.

Preserving and maintaining Snoqualmie Valley's aquatic and riparian ecosystem is an important goal, and the spirit behind this Shoreline Master Program. We envision that our SMP will be used as a guide to bring forth this common initiative; and to be successful, both public and private interests must be represented and protected. Thus, when the need arises to adopt or interpret policy, procedure, or best practice models from this instrument, it is vital that a balance can be struck between public interest and the environment, and private property owners. The North Bend SMP provides the groundwork for a cooperative roadmap that leads us towards a collective good – preservation, protection, and a healthy utilization of our unique and treasured landscape- *North Bend Planning Commission 2011*.

### **Public Access and Recreation**

#### **Goal 1. Enhance North Bend's river shore recreation value by creating a natural linked greenway system.**

##### **Policies**

1.1 Recognize shoreline public access opportunities and recommendations contained in the City's adopted Parks, Recreation, Wildlife Habitat and Open Space Plan and the Si View Metropolitan Park District Comprehensive Plan.

1.2 Public access should be located and designed to respect private property rights, maintain privacy of private property, be compatible with the shoreline environment, protect ecological functions and processes for all critical areas, and protect aesthetic values of the shoreline.

1.3 Acquire or obtain access rights, dedications, and easements to riverfront parcels, including levees and dikes, as available. Such rights should be pursued as opportunities and funding becomes available. Partner with other jurisdictions for funding and obtaining easements.

1.4 Where appropriate, promote the development and enhancement of public access to the river to increase fishing, kayaking and other water-related recreational opportunities.

1.5 Develop guidelines informed by best available science for creating contiguous greenways that protect the riparian environment and related wildlife habitat when opportunities arise.

1.6 As a part of the SMP, prepare and implement a Shoreline Restoration Plan that includes identification of key areas for public access, restoring habitat connectivity of critical areas, protection and improvement projects, consistent with the City of North Bend Shoreline Analysis Report.

1.7 Provide public access in the shoreline jurisdiction in association with the following uses: developments with five or more dwellings; commercial development; industrial development; and public agency development. Ensure public access is consistent with the City's adopted Parks, Recreation, Wildlife Habitat and Open Space Plan.

1.8 Ensure developments, uses, and activities on or near the shoreline do not impair or detract from the public's access to the water or the rights of navigation.

1.9 Provide public access as close as possible to the water's edge of the Middle and South Forks of the Snoqualmie River without causing significant ecological impacts and consistent with appropriate trail standards.

1.10 Identify opportunities for public access on publicly owned shorelines. Preserve, maintain and enhance public access afforded by shoreline street ends, public utilities and rights-of-way.

1.11 Design public access to provide for public safety and comfort and to minimize potential impacts on private property and individual privacy.

1.12 Provide public access and interpretive displays as part of publicly funded restoration projects where significant ecological impacts are addressed.

1.13 Maintain and enhance City parks, trails and public access facilities adjacent to shorelines in accordance with City and County plans.

1.14 Encourage waterfront development to provide a means for visual and pedestrian access to the shoreline area wherever feasible.

1.15 Encourage the acquisition of suitable upland shoreline properties to provide access to publicly owned shorelands. Encourage public access to the South Fork Snoqualmie and Middle Fork Snoqualmie on shoreline street ends, public utilities and rights of way.

**Goal 2. Implement a public access system in accordance with the City's Parks, Recreation, Wildlife Habitat and Open Space Plan that increases the amount and diversity of public access consistent with private property rights, public safety and the natural shoreline character.**

## **Policies**

2.1 Allow for passive and active shoreline recreation that emphasizes location along shorelines in association with the City's Parks, Recreation, Wildlife Habitat and Open Space Plan and Si View Metropolitan Park District Comprehensive Plan.

2.2 Give priority to shoreline recreational development in order to provide access, use, and enjoyment of North Bend's shorelines.

2.3 Encourage the coordination of local, state, and federal recreation planning to satisfy recreational needs.

2.4 Promote recreational developments and plans that conserve the shoreline's natural character, ecological functions, and processes.

2.5 Encourage a variety of compatible recreational experiences and activities to satisfy diverse recreational needs.

2.6 Give water-dependent recreation priority over water-enjoyment recreation uses. Give water-enjoyment recreational uses priority over non-water-oriented recreational uses.

2.7 Integrate and link recreation facilities with linear systems, such as hiking paths, bicycle paths, easements, and scenic drives.

2.8 Pursue opportunities to expand the public's ability to enjoy the shoreline in public parks or public open spaces through dining or other water-enjoyment activities.

2.9 Promote non-intensive recreational uses which avoid adverse effects to the natural hydrology of aquatic systems, do not contribute to flood hazards, and avoid damage to the shoreline environment through modifications such as structural shoreline stabilization or native vegetation removal.

## **Circulation**

### **Goal 3. Implement multi-modal transportation improvements that provide for mobility and access and that minimize adverse impacts on the shoreline environment.**

#### **Policies**

3.1 Allow for maintenance and improvements to existing roads and parking areas. Allow for necessary new roads and parking areas where other locations outside of shoreline jurisdiction are not feasible.

3.2 Plan and develop a circulation network which is compatible with the shoreline environment, and respects and protects ecological and aesthetic values in the shoreline of the state as well as private property rights.

3.3 Include in circulation system planning systems for pedestrian, bicycle, and public transportation where appropriate. Circulation planning and projects should support existing and proposed shoreline uses that are consistent with the SMP.

3.4 Where possible, locate new roads, railroads, and parking as far from the shoreline as feasible to reduce interference with natural shoreline resources or appropriate shoreline uses.

3.5 Ensure, when existing transportation corridors are abandoned, they are reused for water-dependent uses or public access.

3.6 Encourage relocation or improvement of those circulation elements that are functionally or aesthetically disruptive to the shoreline, public waterfront access, and ecological functions.

3.7 Plan parking to achieve optimum use. Where possible, parking should serve more than one use (e.g. serving recreational use on weekends, commercial uses on weekdays).

3.8 Where feasible, provide parking outside shoreline jurisdiction.

3.9 Encourage low-impact parking facilities, such as those with permeable pavements and bio-swales.

3.10 Encourage trail and bicycle paths along shorelines in a manner compatible with the natural character, resources, and ecology of the shoreline.

3.11 Utilize the City's pedestrian and bicycle network which links commercial areas, employment centers, neighborhoods, public facilities, parks, recreation and open space properties, and regional and state-wide trails.

- A. As funding and opportunities permit, protect critical trail linkages and design, construct and/or enhance trail segments identified in the Trail Plan.
- B. Develop links between off-road and on-road pedestrian and bicycle facilities to provide an interconnecting system of trails.
- C. Design portions of the trail system to accommodate a variety of non-motorized users, including pedestrians, road and mountain bicyclists, equestrians, skaters, wheelchair users, and others, recognizing that not all trails will accommodate all users.
- D. Development shall be required to provide connections, or payment in lieu, to the City's bicycle/walkway trails system.
- E. New residential development shall provide for construction of new trails as identified in the Trail Plan Map as part of the development's recreational and common space requirements.
- F. Pursue obtaining trail easements from owners of existing developed lots located within trail corridors identified on the Trail Plan Map for construction of missing trail linkages.
- G. Promote separated walkways and bikeways within new residential developments that can be linked to existing or proposed trails or walkways.



## **Shoreline Uses and Modifications**

### **Goal 4. Encourage shoreline development that recognizes North Bend's natural and cultural values and its unique aesthetic qualities offered by its riverine environment.**

#### **Policies**

#### **Shoreline Environment Designations**

4.1 Designate properties as Natural in order to protect and restore those shoreline areas that are relatively free of human influence or that include intact or minimally degraded shoreline functions that are sensitive to potential impacts from human use. Natural areas should be managed consistent with the following policies:

4.1A. Any use or development activity that would potentially degrade the ecological functions or significantly alter the natural character of the shoreline area should be severely limited or prohibited.

4.1B. Development activity in the Natural environment should only be permitted when no suitable alternative site is available on the subject property outside of shoreline jurisdiction and shall result in no net loss of ecological function.

4.1C. The improvement or alterations of existing roads or creations of new roads to meet public safety needs are allowed when no other location is feasible.

4.1D. When development within the floodplain is unavoidable, projects shall be designed and located to preclude the need for shoreline stabilization, flood control measures, native vegetation removal, or other shoreline modifications.

4.1E. Development activity or significant vegetation removal that would reduce the capability of vegetation to perform relevant ecological functions should be prohibited.

4.1F. Limited access may be permitted for scientific, historical, cultural, educational and low-intensity water-oriented recreational purposes, provided there are no significant adverse ecological impacts.

4.2 Designate properties as Urban Conservancy to protect and restore ecological functions of open space, parks, floodplains and floodways, other critical areas, and other undeveloped areas with low levels of alteration, while allowing a variety of compatible uses. This designation is appropriate for lands such as parks, open space, public property or high-functioning areas of private property, and low-density residential areas, provided specific management policies to guide development and use of these areas are created. The Urban Conservancy environment contains two sub-environments - Urban Conservancy-Residential for areas with moderate to high levels of ecological function that can or do appropriately accommodate shoreline priority residential uses, or Urban Conservancy-Recreation/Open Space for areas that are highly valued for recreation and public access, contain critical areas such as wetlands or floodplains, and/or have low levels of alteration

corresponding to moderate to high ecological function. All Urban Conservancy environments should be managed consistent with the following policies:

4.2A. Allowed uses should be those that preserve the natural character of the area and/or promote preservation and restoration within critical areas, public and private open spaces, and other moderate- to high-functioning areas, either directly or over the long term.

4.2B. Restoration of shoreline ecological functions should be a priority.

4.2C. Development, when feasible, should be designed to ensure that any necessary shoreline stabilization, flood control measures, native vegetation removal, or other shoreline modifications do not result in a net loss of shoreline ecological function or further degrade other shoreline values.

4.2D. Public access and public recreation objectives should be implemented whenever feasible and significant ecological impacts can be mitigated.

4.2E. Water-oriented uses should be given priority over non-water-oriented uses.

4.2F. Recognize that single-family residential development is a preferred use.

4.2G. Commercial and industrial uses, other than limited commercial activities conducted accessory to a public park, should be limited.

4.3 Designate properties as Shoreline Residential to accommodate higher-density residential development and recognize existing and proposed land uses. This designation is appropriate for residential uses on lands with zoning classifications for detached and attached residential. The following management policies should guide development within these areas:

4.3A. Standards for buffers, lot coverage limitations, shoreline stabilization, vegetation conservation, critical area protection, and water quality should mitigate adverse impacts and maintain no net loss of shoreline ecological functions.

4.3B. Access, utilities, and public services should be available and adequate to serve existing needs and/or planned future development.

4.3C. Visual and physical access should be implemented whenever feasible and adverse ecological impacts can be avoided. Within attached residential developments, continuous public access along the shoreline should be provided, preserved or enhanced.

4.3D. Water-dependent recreational uses should be permitted.

4.3 Limited water-oriented commercial uses which depend on or benefit from a shoreline location should also be permitted provided the underlying zoning classifications permit such uses.

4.4 Designate properties as Commercial Conservancy to accommodate intensive land uses, such as commercial, office, retail, transportation, warehouse, manufacturing, and mixed-use developments. The following management policies should guide development within these areas:

4.4A. Manage development so that it enhances and maintains the shorelines for a variety of urban uses, with priority given to water-dependent, water-related and water-enjoyment uses. Non-water-oriented uses should not be allowed except as part of an existing development unless such uses would not conflict with or limit opportunities for water-oriented uses or on sites where there is no direct access to the shoreline.

4.4B. Visual and physical access should be implemented whenever feasible and adverse ecological impacts can be avoided. Continuous public access along the shoreline should be provided, preserved or enhanced when feasible.

4.4C. Aesthetic objectives should be implemented by means such as sign control regulations, appropriate development siting, screening and architectural standards, and maintenance of natural vegetative buffers.

4.5 Designate properties as Aquatic to protect, restore, and manage the unique characteristics and resources of the areas waterward of the OHWM. The following management policies should guide development within these areas:

4.5A. Provisions for the management of the Aquatic environment should be directed towards maintaining and restoring shoreline ecological functions.

4.5B. Shoreline uses and modifications should be designed and managed to prevent degradation of water quality and alteration of natural hydrographic conditions.

4.5C. All developments and uses should be located and designed to protect public recreational uses of the water; to minimize adverse visual impacts; and to allow for the safe, unobstructed passage of fish and wildlife, particularly those species dependent on migration.

4.5D. New overwater structures for public access and public infrastructure are permitted provided they are the minimum size necessary to support the structure's intended use and will not preclude attainment of ecological restoration.

4.5E. Underwater pipelines and cables should not be permitted unless demonstrated that there is no feasible alternative location based on an analysis of technology and system efficiency, and that the adverse environmental impacts are not significant or can be shown to be less than the impact of upland alternatives.

## **Agriculture**

4.6 Allow existing agricultural activities as part of the community's heritage.

4.7 Design new agricultural uses and expansions of existing uses consistent with the SMP to minimize impacts on shoreline environments.

4.8 Prohibit the creation of agricultural land by diking, draining, or filling wetlands or channel migration zones.

4.9 Maintain a vegetative buffer between agricultural lands and waterbodies or wetlands in order to reduce harmful bank erosion and resulting sedimentation, enhance water quality, reduce flood hazard, and maintain habitat for fish and wildlife.

4.10 Use appropriate farm management techniques to prevent contamination of nearby waterbodies and adverse effects on valuable plant, fish, and animal life from fertilizer and pesticide use and application.

4.11 Encourage agricultural-recreation activities on the Tollgate and Meadowbrook Farms.

#### **Aquaculture**

4.12 Give preference to aquaculture operations that minimize environmental impacts through use of fewer visible structures or less extensive substrate and vegetation modifications.

4.13 Do not allow aquaculture in areas where it would degrade water quality, result in a loss of shoreline ecological function, impair navigation, or conflict with other water-dependent uses.

4.14 Design aquaculture facilities to minimize nuisance odors and noise, as well as visual impacts on surrounding shoreline development.

#### **Boating Facilities (Boat Launches)**

4.15 Limit new boating facilities to public or community launches for canoes, kayaks or other hand-powered vessels.

4.16 Locate new boating facilities and allow expansion of existing facilities at sites with suitable environmental conditions, shoreline configuration, access, and neighboring upland and aquatic uses.

4.17 Require restoration activities when substantial improvements or repair to existing boating facilities is planned.

4.18 Boating facilities that minimize the amount of shoreline modification are preferred.

4.19 Over-water boating facilities are prohibited.

4.20 Boat moorage is prohibited.

#### **Breakwaters, Jetties, Groins and Weirs**

4.21 To the extent feasible, limit the use of breakwaters, jetties, groins, weirs or other similar structures to those projects providing ecological restoration or other public benefits.

### **Dredging and Dredge Material Disposal**

4.22 Dredging and dredge material disposal should avoid and minimize significant ecological impacts. Impacts which cannot be avoided should be mitigated and result in no net loss of ecological function.

4.23 Design and locate new shoreline development to avoid the need for dredging.

4.24 Limit dredging and dredge material disposal to the minimum necessary to allow for shoreline restoration, flood hazard reduction, and maintenance of existing legal moorage and navigation. Dredging to provide for new navigation uses is prohibited.

4.25 Allow dredging for the primary purposes of flood hazard reduction only as part of a long-term management strategy consistent with an approved flood hazard management plan.

### **Fill**

4.26 Limit fill waterward of the OHWM to support ecological restoration or to facilitate water-dependent or public access uses. All impacts shall result in no net loss of ecological function.

4.27 Allow fill consistent with floodplain regulations upland of the OHWM provided it is located, designed and constructed to protect shoreline ecological functions and ecosystem-wide processes, including channel migration, and is the minimum necessary to implement an approved project.

### **Forest Practices**

4.28 Ensure compliance with the State's Forest Practices Act for all forest management activities including Class IV, general forest practices, where shorelines are being converted or are expected to be converted to non-forest uses.

4.29 Ensure all forest practices within shoreline areas adhere to buffer distance and mitigation standards, and result in no net loss of ecological function by consulting Best Available Science and following Best Management Practices.

4.30 When forest lands are converted to another use, assure no net loss of shoreline ecological functions or significant adverse impacts on other shoreline uses, resources and values such as navigation, recreation and public access.

### **In-Stream Structures**

4.31 Locate, plan and permit in-stream structures only when consistent with the full range of public interests, ecological functions and processes, and environmental concerns, with special emphasis on protecting and restoring priority habitats and species.

## **Mining**

4.32 Locate mining facilities outside shoreline jurisdiction whenever feasible.

4.33 Do not allow mining in any location waterward of the OHWM.

4.34 Design and locate mining facilities and associated activities to prevent loss of ecological function. Give preference to mining uses that result in the creation, restoration, or enhancement of habitat for priority species.

## **Residential Development**

4.35 Consider single-family residential development as a priority use only when developed in a manner consistent with the control of pollution and prevention of damage to the natural environment. These goals can be achieved by, but are not limited to:

- A. maintaining the natural hydrologic cycle and minimizing alterations of natural drainage patterns;
- B. encouraging alternative impervious surface techniques that yield low runoff potential;
- C. providing for the retention and replanting of native vegetation for ecological and erosional stability;
- D. developing and implementing watershed management plans that protect water quality and address nonpoint pollution and the cumulative effects of land management on ecological systems;
- E. utilizing low impact development (LID) techniques and site planning;
- and
- F. promoting innovative and environmentally sensitive development practices in siting, design, materials selection, construction, and maintenance.

4.36 Locate and construct residential development in a manner that assures no net loss of shoreline ecological functions.

4.37 Ensure the overall density of development, lot coverage, and height of structures is appropriate to the physical capabilities of the site and consistent with the comprehensive plan.

4.38 Ensure new residential development provides adequate buffers or open space from the water to protect or restore ecological functions and ecosystem-wide processes, to preserve views, to preserve shoreline aesthetic characteristics, to protect the privacy of nearby residences, and to minimize use conflicts.

4.39 Make adequate provisions for services and infrastructure necessary to support residential development.

4.40 Design and locate new residences so that shoreline stabilization will not be necessary to protect the structure. The creation of new residential lots should not be allowed unless it is demonstrated the lots can be developed without:

- A. Constructing shoreline stabilization structures (such as bulkheads).
- B. Causing significant erosion or slope instability.
- C. Removing existing native vegetation within shoreline buffers.

### **Shoreline Habitat and Natural Systems Enhancement Projects**

**Goal 5. Protect and restore the natural hydraulic, hydrologic, and habitat functions, scenic as well as recreation values of North Bend's shorelines.**

#### **Policies**

5.1 Include provisions for shoreline vegetation restoration, fish and wildlife habitat enhancement, and low impact development techniques in projects located within shoreline jurisdiction, where feasible and informed by Best Available Science.

5.2 Encourage and facilitate implementation of projects and programs included in the Shoreline Master Program Shoreline Restoration Plan.

5.3 Protect shoreline processes and ecological functions through regulatory and non-regulatory means that may include acquisition of key properties, conservation easements, regulation of development within shoreline jurisdiction, and incentives to private property owners to encourage ecologically sound design.

5.4 Work with other jurisdictional agencies in the region and with the private sector to deal effectively with regional and watershed-wide natural environment issues and the protection, preservation, and enhancement of all shorelines and adjacent critical areas.

5.5 Enhance and restore areas which are biologically and aesthetically degraded to the greatest extent feasible while maintaining appropriate use of, and public access to, the shoreline.

5.6 Conserve and protect critical areas within shoreline jurisdiction from loss or degradation.

5.7 Protect and restore critical freshwater habitat and other areas that provide habitat for endangered, threatened or sensitive fish and wildlife species using methods informed by Best Available Science.

5.8 Protect and restore vegetation to maintain and enhance habitat, aesthetic and recreational values. Retention and planting of conifers is particularly desired as a source of future large woody debris recruitment.

5.9 Protect and preserve water quality in the South Fork and Middle Fork Snoqualmie Rivers.

5.10 Preserve and enhance public access opportunities to and along the shoreline consistent with protecting shoreline processes and ecological functions.

### **Shoreline Stabilization**

5.11 Locate and design new development, including subdivisions, to eliminate the need for new shoreline modification or stabilization.

5.12 Design, locate, size and construct new or replacement structural shoreline stabilization measures to minimize and mitigate the impact of these modifications on the City's shorelines.

5.13 Give preference to non-structural shoreline stabilization measures over structural shoreline stabilization and give preference to soft structural shoreline stabilization over hard structural shoreline stabilization.

5.14 Encourage fish-friendly shoreline design during new construction and redevelopment by offering incentives and regulatory flexibility.

### **Utilities**

5.15 Allow for utility maintenance and extension with criteria for location and vegetation restoration as appropriate.

5.16 Plan, design, and locate utility facilities to minimize harm to shoreline functions, preserve the natural landscape, and minimize conflicts with present and future planned land and shoreline uses while meeting the needs of future populations in areas planned to accommodate growth.

5.17 Do not permit new primary utility production and processing facilities, or parts of those facilities, such as power plants, solid waste storage or disposal facilities that are non-water-oriented within shoreline jurisdiction unless no other options are feasible. Primary utility facilities, such as wastewater treatment plants and including expansion of existing facilities, should be located in shoreline jurisdiction only if no practical upland alternative or location exists. Such facilities and expansions should be designed and located to minimize impacts on shoreline ecological functions, including riparian and aquatic areas, and to the natural landscape and aesthetics. Public health and safety should be the highest priority for the planning, development and operation of primary utility facilities.



5.18 Locate utility transmission facilities for the conveyance of services, such as power lines, cables, and pipelines, outside of shoreline jurisdiction where feasible. Where permitted within shoreline jurisdiction, such facilities should be located within existing or approved road crossings or in such a way as to minimize potential adverse impacts on shoreline areas.

5.19 Locate new utility facilities so as not to require extensive shoreline protection works.

5.20 Locate utility facilities and corridors to protect scenic views from public parks and trails. Whenever possible, such facilities should be placed underground, or alongside or under bridges.

5.21 Design utility facilities and rights-of-way to preserve the natural landscape and to minimize conflicts with present and planned land uses.

### **Existing Uses**

5.22 Allow nonconforming existing legal uses and structures to continue in accordance with this SMP. Residential structures and appurtenant structures that were legally established and are used for a conforming use, but that do not meet standards for the following should be considered a conforming structure: setbacks, buffers, or yards; area; bulk; height; or density.

5.23 Allow alterations of nonconforming structures, uses, and lots in consideration of historic development patterns, when occupied by preferred uses, and when consistent with public safety and other public purposes.

5.24 Encourage transitions from nonconforming uses to conforming uses.

5.25 Allow for nonconforming structures to expand when they do not increase the nonconformity according to SMP requirements.

5.26 Allow for existing roads, driveways and utility lines to continue and expand when they do not increase the nonconformity according to SMP requirements.

5.27 Consider the no-net-loss of ecological function objective to guide review of proposed expansions or other changes to nonconforming uses and new development on nonconforming vacant lots. This objective may be addressed in an areawide manner consistent with the SMP cumulative impacts analysis.

### **Critical Areas**

5.27 Conserve and protect critical areas within shoreline jurisdiction from loss or degradation.

5.28 Locate and design public access within and adjacent to critical areas to ensure that ecological functions are not adversely impacted.

5.29 Protect and manage shoreline-associated wetlands, including maintenance of sufficient volumes of surface and subsurface drainage into wetlands, to sustain existing vegetation and wildlife habitat.

5.30 Protect critical freshwater habitat, including channel migration zones, and other areas that provide habitat for endangered, threatened or sensitive fish and wildlife species.

5.31 Manage development in geologically hazardous areas, including channel migration zones, to avoid risk and damage to property and loss of life from geological conditions.

5.32 Regulate development within the 100-year floodplain to avoid risk and damage to property and loss of life.

5.33 Protect Critical Aquifer Recharge Areas (CARA's) for their importance in recharging aquifers which North Bend uses for potable water. All surface water generated by development should be treated per current stormwater regulations adopted by the City to ensure no hazardous substances enter the groundwater.

#### **Shoreline Vegetation Conservation**

5.34 Protect and restore vegetation to maintain and enhance habitat, aesthetic and recreational values. Retention and planting of conifers is particularly desired as a source of future large woody debris recruitment.

5.35 Plan and design new development or substantial redevelopment to retain or provide shoreline vegetation.

5.36 Prohibit the introduction of invasive plant species along shorelines and encourage the removal of noxious and invasive weeds.

5.37 Protect, enhance, and maintain healthy trees and vegetation consistent with the value North Bend places on trees and other vegetation as integral to community character and quality of life. Minimize tree clearing and thinning activities in shoreline jurisdiction and require mitigation for trees that are removed. Selective pruning of trees for safety and view protection may be allowed.

5.38 Recognize the most recent inter-agency guidance on levee vegetation management to maintain levee safety and address aquatic habitat needs.

#### **Water Quality, Stormwater Management, and Nonpoint Pollution**

5.39 Protect and preserve water quality in the South Fork and Middle Fork Snoqualmie Rivers.

5.40 Manage stormwater quantity to ensure protection of natural hydrology patterns and avoid or minimize impacts on streams.

5.41 Encourage use of low impact development techniques in all new development and redevelopment proposals.

5.42 Support public education efforts to protect and improve water quality.

## **Historic, Cultural, Scientific, and Educational Resources**

### **Goal 6. Recognize cultural and historical resources as an essential part of North Bend's identity and heritage.**

#### **Policies**

6.1 Encourage educational and scientific projects and programs that foster a greater appreciation of the importance of shoreline management, river-oriented activities, environmental conservation and local historic connections with North Bend's rivers.

6.2 Due to the limited and irreplaceable nature of the resource, prevent public or private uses, activities, and development from destroying or damaging any site having historic, cultural, scientific or educational value as identified by the appropriate authorities and deemed worthy of protection and preservation.

6.3 Protect, preserve, or restore buildings, sites, and areas of shoreline having scientific or educational values or significance.

## **Flood Hazard Management**

### **Goal 7. Protect public safety within river floodways and floodplains and protect natural systems by preserving the flood storage function of floodplains.**

#### **Policies**

7.1 Manage development proposed within floodplains, floodways and channel migration zones consistent with the Shoreline Management Act, the Federal Emergency Management Agency (FEMA) standards, and this SMP, including the Critical Areas Regulations for frequently flooded areas and geologically hazardous areas.

7.2 Work with other cities, King County, and state and federal agencies to deal effectively with regional flooding issues.

7.3 Control stormwater runoff in a manner consistent with low impact development practices which utilize natural detention, retention and recharge techniques to the maximum extent possible.

7.4 Prohibit any development within the floodplain which would individually or cumulatively cause any increase in the base flood elevation. Encourage purchase of properties that have experienced repetitive loss.

## **Climate Change**

**Goal 8. Recognize that shorelines are impacted by climate change and encourage adaptation to promote resiliency.**

### **Policies**

8.1 Support development regulations for vegetated areas along streams, which once supported or could in the future support mature trees, that include buffers of sufficient width to facilitate the growth of mature trees and periodic recruitment of woody vegetation into the water body to support vegetation-related shoreline functions.

8.2 Regulate uses and development as necessary within and along stream channels, associated channel migration zones, wetlands, and floodplains within the shoreline jurisdiction, to assure that no net loss of shoreline ecological processes and functions results from new development near freshwaters of the state, including associated hyporheic zones.

8.3 Continue to support the goals of no net loss of wetland functions and values within each drainage basin in the face of climate change. Acquisition, enhancement, regulations, and incentive programs such as the City's water conservation ordinance shall be used independently or in combination with one another to protect and enhance critical area functions and values.

8.4 The city may wish to evaluate in the future and map all low-lying areas susceptible to flooding, focusing on areas impacted by increases in water levels exacerbated by climate change. This effort shall include consideration for current and future environmental conditions.

8.5 The city should consider developing plans to address increased storm frequency and intensity to build resilience in stormwater management, flood management, and drainage management. These plans should incorporate integrated floodplain management wherever possible.

8.6 The city shall employ a comprehensive approach to managing low flow conditions and drought response, taking into consideration the needs of the environment, agriculture, and vulnerable communities.

## **Economic Development**

**Goal 9. Support the development of water-oriented commercial services and attractions that serve tourism and support the community's economy and river environment.**

Policies

- 9.1 Promote the South and Middle Forks of the Snoqualmie River as a community economic asset.
- 9.2 Develop a means of identifying, restoring and maintaining the additional economic benefit gained by shoreline location such as recreational or tourism benefits. Emphasis should be placed on shorelines with cultural and environmental significance to help residents and visitors acquire knowledge, attitudes, and skills necessary to connect culturally and recreationally with their surroundings.
- 9.3 Give preference to economic activities which either leave natural shoreline features and adjacent critical areas such as trees, shrubs, grasses and wildlife habitat unmodified, or which modify them in a way which enhances human awareness and appreciation of the river's beauty and relation to other natural and non-natural surroundings.
- 9.4 Give first preference to water-dependent ecological processes uses, second preference to water-related or water-enjoyment economic activities, and last preference to non-water-oriented uses in areas where limited commercial or industrial development space along shorelines is in demand for a number of competing uses.
- 9.5 Where possible, developments are encouraged to incorporate low impact development techniques into new and existing projects and integrate architectural and landscape elements that recognize the river environment. Development in critical areas and areas that provide habitat connectivity is discouraged.
- 9.6 Require non-water-oriented commercial or industrial development to provide for ecological restoration and public access as appropriate.
- 9.7 Assure that commercial and industrial development will not result in a net loss of shoreline ecological functions or have significant adverse impacts on navigation, recreation and public access.

**Goal 10. Allow for commercial, industrial and manufacturing uses designed with sensitivity to the environment and aesthetic character that incorporate low impact technologies and provide opportunities for public enjoyment of the shoreline.**

Policies

- 10.1 Promote water-oriented commercial uses in shoreline areas with current or planned commercial uses, such as Downtown North Bend.

- 10.2 Explore ways in which the downtown retail shopping area might be further enhanced and linked to the South Fork Snoqualmie River.
- 10.3 Encourage multi-use commercial projects that include some combination of ecological restoration, public access, open space, and recreation.
- 2.4 Allow for infill or new industrial development when consistent with shoreline master program guidelines. As mitigation for impacts on shoreline resources and values, ensure industrial development incorporates shoreline restoration or public access where feasible and consistent with security needs.
- 10.4 Avoid designating lands for industrial. Promote limited development in all designated Shorelines of the State within North Bend. that include shoreline areas with severe environmental limitations.