



ENVIRONMENTAL QUALITY

Support Analysis

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INTRODUCTION

The purpose of the Environmental Quality Element is to expand upon the community's commitment to the stewardship of the natural environment, and to provide a basis for policies to guide City decisions which affect the natural environment. The residents of Maple Valley recognize that the quality of life they perceive is directly associated with the quality of the environment. This environment is a complex system of interrelated components upon which the City depends, including air, water, soils, plants and animals. Historically, people have come to Maple Valley because these components have remained relatively pristine. More recently, these components have become increasingly impacted by human activity. The value of understanding the relationship between Maple Valley residents and the natural environment is to realize the importance of maintaining it as a mutually supportive one and to balance competing objectives to the maximum extent possible.

The State Growth Management Act (GMA) contains the following goal: to "protect the environment and enhance the State's high quality of life, including air and water quality, and the availability of water." Moreover, the GMA contains specific requirements for the designation and protection of "**critical areas**," defined by the GMA as *wetlands, areas with critical recharging effect on aquifers used for potable water, fish and wildlife habitat conservation areas, frequently flooded areas, and geologically hazardous areas*. The GMA requires jurisdictions to adopt interim critical areas, and regulations to protect those areas, prior to the adoption of the Comprehensive Plan, and to finalize such regulations following Plan adoption.

This chapter is divided into the following sections for purposes of discussion and mapping:

- Critical Areas
The natural water system (watersheds, subbasins, lakes and wetlands, noxious weed eradication projects, streams, floodplains, and groundwater recharge areas); soils and topography (including geologic hazard areas); and plants and animals (including wildlife habitat).
- Goals and Policies
The policies and strategies to guide the City in protecting the natural environment.

Most of the discussion in this element is about critical areas, because of their vital environmental importance. They include areas which:

- Are subject to natural hazards;
- Contain significant renewable resources;
- Support unique, intrinsic, fragile or valuable elements of the natural environment;
- Contain valuable cultural resources;
- Contain protective buffers necessary to protect public health, safety and welfare; or
- Include state or federal protected species.



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The critical areas located inside the Maple Valley City limits include streams and wetlands, erosion hazard areas, and aquifer recharge areas. Flood plains, landslide areas and seismic hazard areas are located adjacent to or just northeast of the City in the Cedar River Valley, or what is now known as Old Maple Valley. According to the *Tahoma Raven Heights Communities Plan*, sensitive areas that are of significant concern in the Maple Valley area and surrounding communities are stream corridors, flood hazard areas, groundwater recharge areas, and wildlife habitats.¹ Critical areas have been mapped and calculated to determine relative impacts to future land use planning. These areas are listed in the following table:

Undeveloped Critical Areas – City of Maple Valley (in acres)

Geologic Hazard Area			Wetland	Floodplain	Total
Erosion	Landslide	Seismic			
62	7	4	9	0	82

Source: Earth Tech, 1998

Figure - 6.1 Undeveloped Critical Areas

There are a total of 82 acres of critical areas representing nine percent of total undeveloped land in the City. The calculations do not include areas highly susceptible to groundwater contamination (which underlay approximately half of the City's entire area) or the City's lakes and stream corridors.

NATURAL WATER SYSTEM

Water is a powerful force that constantly shapes the form and function of the land. Stream channels by their very nature migrate to accommodate changes in the water, landscape and ecosystem. Heavy rains scour channels out, and re-deposit loose material downstream. Surface chemicals from one location are dissolved and carried to another, usually a wetland or lake where water is filtered. As urban development occurs, native vegetation and absorbent top soils are removed, land becomes compacted and paved, existing site topography is changed, and natural water courses are often realigned. Such landscape changes 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.

The natural water system in Maple Valley exists within two major watersheds (or basins): the Green River (Soos Creek Basin) and the Cedar River watersheds. The watersheds comprise subbasins, streams, wetlands, lakes, and a dynamic exchange between the surface and groundwater flows. The primary sources of water for Maple Valley's lakes and wetlands are direct precipitation, surface water runoff, flows from rivers and streams, and subsurface flows of groundwater. The water leaves the lakes and wetlands primarily through direct evaporation, surface outflows, and seepage into groundwater.

¹ King County Planning Division: *Tahoma Raven Heights Communities Plan*, May, 1982, p. 59.



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Protection of the natural water system is important for many reasons, including flood control and fish/wildlife habitat protection. The protection of surface water is specifically important because it filters through areas of highly permeable soil into the groundwater, or aquifers, which have historically been the primary source of drinking water for Maple Valley.

Watersheds

The southern and western portion of the City of Maple Valley is located in the Soos Creek Basin which drains into the Green River. Tributaries to Big Soos Creek include the Upper Jenkins Creek Subbasin, the Lake Lucerne Subbasin (which includes the Lake Lucerne, Pipe Lake and Lake Wilderness drainage areas), and the Lake Sawyer Subbasin. Most of this area ultimately drains to Jenkins Creek, which flows into Big Soos Creek and ultimately drains to the Green River east of Auburn. The cities of Kent and Tacoma rely upon the Soos Creek Basin for their drinking water supply.

The northern and eastern portion of Maple Valley (the area located between State Highway 169 and the Cedar River) is in the Lower Cedar River Basin. This is a 66-square-mile basin encompassing 15 tributaries from the upland head of the stream at the Landsburg Dam, to the lowland mouth at Lake Washington in Renton. The City of Seattle relies upon the Upper Cedar River Basin for its drinking water.

Lakes and Wetlands

Maple Valley's lakes and wetlands, and associated riparian areas, perform valuable functions within Maple Valley's ecosystem. They receive surface water from the surrounding area and filter pollutants entering the system by a combination of physical, chemical and biological processes. They also provide drainage, flood storage, and wildlife habitat as well as recreational opportunities for local residents. They are an important aesthetic component to the City's quality of life. The historic practice of clearing vegetation in wetlands, or grading, filling, draining, and other land development activities, has often destroyed the wetlands and streams, or in many cases decreased their ability to provide these important functions.

The State of Washington defines wetlands as:

"Areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions."

Wetlands generally include swamps, marshes, bogs, and similar areas. Wetlands do not include those artificial wetlands intentionally created from non-wetland sites, including, but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm ponds, and landscape amenities, or those wetlands created after July 1, 1990, that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands

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may include those artificial wetlands intentionally created from non-wetland areas created to mitigate conversion of wetlands.

This definition of wetlands is the same as that used by the U.S. Army Corps of Engineers pursuant to Section 404 of the federal Clean Water Act.² The City's lakes are prime focal points for open water and wetland plant and animal species.

Wetlands in Maple Valley were mapped as part of the King County Wetlands inventory, and can be found in the *King County Sensitive Areas Map Folio*. This inventory focused on the larger wetlands of the County. There may also be smaller wetlands in Maple Valley that have yet to be formally identified and mapped (e.g., the Meadows area). The major wetlands in Maple Valley are generally distributed throughout a mile-wide strip that runs from north to south through the middle of the City (northwest and southwest of Lake Wilderness). One of the only wetlands in the City that appears to be undeveloped is located along the west side of Witte Road between SE 259th Street and SE 264th Street. The largest wetland, now partially developed as Elk Run Golf Course, is located further south between S.E. 268th and 276th Street. These wetlands serve as important flood and storm water storage areas during heavy storm events.

Maple Valley's lakes are classified as shorelines. The three main lakes in the City of Maple Valley are Lake Wilderness, Pipe Lake, and Lake Lucerne.³ They are all located in the Jenkins Creek sub-basin of the Green River Watershed. *Lake Wilderness* is a 67-acre lake with associated wetlands. It has a mean depth of 21 feet and a maximum depth of 38 feet, and contains trout. The lake drains via open and underground channel into Jenkins Creek. It is used heavily for swimming and fishing in summer, and has public access for boats. Internal combustion engines are not allowed on the lake. Bald Eagles have been sighted using the shoreline⁴, and the lake is managed for trout.

Pipe Lake

Pipe Lake is a 52-acre lake. The lake has a mean depth of 27 feet and a maximum depth of 65 feet, and drains via open channel to Cranmar Creek. It does not have public access within the City limits of Maple Valley, and is currently not managed for any particular species. The lake also contains confirmed Bald Eagle habitat.

Lake Lucerne

Lake Lucerne is a 16-acre lake. Its mean depth is 18 feet, and its maximum depth is 37 feet. The lake drains by pipe into Jenkins Creek. The lake does not have public access, and is currently not managed for any particular species. The lake has confirmed Bald Eagle habitat.⁵

² King County, December, 1990: *Sensitive Areas Map Folio*.

³ Lake depths and acres are from King County Department of Surface Water Management, 1995: *Lakeside Logic: A Guide to Lake Stewardship in King County*, p. 10-11. Other lake information is from the *King County Wetlands Inventory, March, 1991*.

⁴ King County Wetlands Inventory, March, 1991, Jenkins Creek 22.

⁵ King County Wetlands Inventory, March, 1991, Jenkins Creek 21.



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Noxious Weed Eradication Projects

The King County Water and Land Resource Division's Lakes Program, in cooperation with the cities of Covington and Maple Valley, continues its effort to eradicate noxious weeds in area lakes. Noxious weeds spread by vegetative reproduction and grow quickly once they are established, displacing native species and eventually filling what was once open water with dense plant material. This inhibits swimming, boating, and fishing in the affected areas. It is important to control infestation early before the lakes become too costly to restore.

A noxious weed, the *Eurasian watermilfoil*, is encroaching upon Lake Wilderness. The Lake Wilderness Integrated Aquatic Plant Management Plan, adopted in May 1997, was developed to target eradication of Eurasian watermilfoil. The Lake Wilderness Management District was formed among adjacent lake-side property owners early in 1998 to ensure funding for cleanup of the lake.

The eradication program consists of scheduled spraying of an aquatic herbicide called *Sonar* (fluridone) directly over the lakes' surfaces on an ongoing basis for a period of nine years. After this period, an herbicide called *Aquathol* will need to be sprayed to keep the aquatic plants under control. *Sonar* does not have any documented health hazards if it is used properly.⁶ Its only limitation is that it cannot be sprayed within ¼ mile of a drinking water intake. Lake area residents are notified of the spraying schedule, and asked not to swim during spraying times. However, there are no swimming hazards associated with *Sonar* treatment, and fish are not significantly affected by the chemical.

Streams

A healthy stream network provides 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. The most effective solution for protecting natural drainage systems is to control the amount and quality of surface water runoff. Increases in water velocity, sedimentation, or contaminants can create serious adverse effects on stream habitats for fish and wildlife.

Most of the streams in the Soos Creek Basin have relatively good water quality. Localized water quality degradation has been observed, such as high fecal coliform levels in some small creeks, and invasive non-native plants and concentrated nutrient levels in lakes. These instances occur mostly due to failing septic systems; agricultural runoff from livestock, pets, and terrestrial animals; or where high levels of urban runoff are not properly treated prior to entering the natural surface water system.

Maple Valley is beginning to see the surface water effects of rapid development. These effects are mainly in the form of increased stormwater runoff, but also include flooding, erosion, sedimentation,

⁶ City of Maple Valley, *Maple Valley Leaves*, Issue 2, June, 1998, p. 1.

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destruction of fish habitat, and water quality degradation.⁷ The long term effects of such surface water problems include rising pollutant levels that can pollute domestic water supply wells, especially in areas with coarse gravelly soils.⁸ Under these conditions, the use of streams for water supply recharge, fish habitat and recreation becomes more problematic.

Drainage system problems are caused by many types of development actions including the following:

- Filling or siting development in wetlands.
- Stream channelizations.
- Loss of forested stream corridors.
- Fish passage barriers.
- Dewatering.
- High flows and sediment movement.

The State Department of Natural Resources rates streams from Class 1 (shorelines of the State) to Class 5, based on cold water commercial and game value. Classes 1 through 3 usually have spawning salmon. Classes 4-5 may have spawning salmon. Class 5 streams are small and may be seasonal. In detail:

- Class 1 streams are those inventoried as “Shorelines of the State” under King County’s Shoreline Master Program.
- Class 2 streams are those smaller than Class 1 streams that flow year-round during years of normal rainfall or those that are used by salmonids.
- Class 3 streams are those that are intermittent or ephemeral during years of normal rainfall and are not used by salmonids.
- Unclassified streams are those for which a watercourse has been identified but for which the defining characteristics of a Class 1, 2 or 3 stream have not been determined. Further study is necessary to classify these streams.

Cedar River

The Cedar River is a Class 1 stream flowing northwestward just north of the City limits. This is the largest stream in the Maple Valley area. It is the largest and cleanest source of water for Lake Washington, contributing almost 50 percent of the lake’s total inflow. It provides two-thirds of the City of Seattle’s water supply and is home to significant anadromous fish runs, including endangered Chinook Salmon.⁹ The Department of Ecology has designated the length of the Cedar River, from the four-mile point measured from the mouth to the headwaters, with a Class AA water quality rating (extraordinary). This rating prohibits waste discharge into the stream.

Rock Creek is a Class 2 stream with salmonids along the City’s eastern boundary. It flows through *the Rock Creek Natural Area* and drains into the Cedar River. This Natural Area is managed by King County to maintain its pristine qualities.

⁷ King County *Soos Creek Basin Plan* 1990: 1.

⁸ See the discussion on septic tanks, wells and groundwater in the Potable Water section.

⁹ King County Surface Water Division: Lower Cedar River Basin Plan Summary, March, 1996. p. 9.



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Green River

The Green River is a Class 1 stream located several miles south of Maple Valley, connected to many of Maple Valley's streams through Jenkins Creek. The Green River has some of the best water quality in all of Puget Sound. (It is also rated as Class AA in water quality.) The streams in Maple Valley that drain into the Green River are listed and described below.

Cranmar Creek is a Class 2 stream with salmonids, which flows south out of a partially developed wetland in the Elk Run Golf Course.

Jenkins Creek, North Fork

Jenkins Creek, North Fork is a Class 2 stream with salmonids, which drains Lake Wilderness. It was recently "daylighted" through the King County Surface Water Management Program (i.e., restored from a culvert stream to an open channel).

Jenkins Creek, South Fork

Jenkins Creek, South Fork is a Class 2 stream with salmonids, and is connected to Lake Lucerne via one of the only undeveloped wetlands in Maple Valley. A portion of this creek was also "daylighted" by King County.

Floodplains

Flooding is a natural geologic process that helped to shape Maple Valley. It occurs regularly, leaving some areas particularly unsafe for habitation and development. These *Flood Hazard Areas* are defined by the Federal Emergency Management Agency (FEMA) as those areas subject to inundation by the 100-year flood. A 100-year flood has at least a one percent probability of inundation in any given year. This percentage has measurably increased in recent years due to development rapidly reducing the storage capacity of floodplains and increasing the amount of surface runoff. FEMA has developed a program to assist homeowners in relocating their frequently flooded homes out of the floodplain.

The current city limits do not contain any designated 100-year floodplains. The Cedar River Valley is the nearest 100-year floodplain to Maple Valley. It runs just north of the City from southeast to northwest. During flooding, the river overflows its banks and spreads out over the valley floor. Within the City boundaries, streams, lakes, wetlands and closed depressions all have the potential to form floodplain conditions. These areas can overflow their banks during significant storm events. When they do, they usually drain into nearby wetland soils. These overflows can be managed by strategically protecting, as well as constructing, wetlands which provide flood water reservoirs, storing surplus water as groundwater during wet periods and later discharging this stored water into streams to augment base stream flows.



Groundwater Recharge Areas

Much of Maple Valley and its surrounding neighbors rely on groundwater for drinking water supply.¹⁰ This supply is recharged in areas that have high soil permeability, where rainwater percolates into subsurface saturated zones, or aquifers. In fact, the City of Kent owns two significant tracts of land adjacent to the Maple Valley city limits that it utilizes for well fields. The groundwater recharge areas that are of concern are those “areas highly susceptible to groundwater contamination,” as identified and mapped by multiple jurisdictions including King County, Covington Water District, City of Kent, and the City of Maple Valley.

The major concern with recharge areas is maintaining the appropriate density and type or intensity of development that would not threaten groundwater. Susceptibility to groundwater contamination is based on the combined effect of hydrology (such as water table depth, gradient and soil structure) with the potential for contamination based on above and surrounding land uses. Land uses such as waste disposal sites, industry, and even households are potentially harmful if they have chemicals or toxins on sites that can be spilled or otherwise introduced into the groundwater.

Approximately 50 percent of Maple Valley is underlain by areas highly susceptible to groundwater contamination. Urbanization of recharge areas typically reduces groundwater infiltration, due to conversion of permeable soils with pavement and other impervious surfaces. In the last decade, development in the Cedar River Basin is estimated to have reduced groundwater recharge by five to ten percent.¹¹ The Green River Basin has seen similar or even greater levels of development.

All industrial areas in Maple Valley are entirely or partially located above a groundwater recharge area. One is located on the northwest corner of SE 260th Street and SR 169, another one is located on the north side of the Cedar River Pipeline road, east of Witte Road, and another small one is located at SE 240th and SR 169. According to the *Covington Water District 1994 Comprehensive Water System Plan*, several existing land use activities could pose a threat to the aquifers within this area.¹² The City will incorporate these recharge areas into its critical areas regulations.

Wellheads

Wellheads are also points of susceptibility to groundwater contamination. The Covington Water District gets a significant portion of its water supply from two well fields: at Lake Sawyer (just south of SE 288th Street) and at Witte Road (at the intersection with SE 264th Street). The District has adopted wellhead protection programs for these wells that will be incorporated into the City's development regulations.

¹⁰ King County Planning Division: Tahoma Raven Heights Communities Plan, May, 1982, p. 63.

¹¹ King County Surface Water Division: Lower Cedar River Basin Plan Summary, March, 1996. P. 9.

¹² Section 1, “Lake Sawyer Wellhead Protection Plan Executive Summary,” *Covington Water District 1994 Comprehensive Water System Plan*, Volume 2, Selected Appendices.



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Planning Issues of the Natural Water System

Over the last century, the Cedar and Green Rivers, and Cranmar and Jenkins Creeks, have been affected by logging and forest removal, coal mining, agricultural activities, and development – without consideration of long-term consequences. These actions have led to denuded slopes, channelized streams, encroachment on floodplains, and decreased water quality. The cumulative effects of these actions are erosion, sedimentation of stream channels, flooding of homes, and the destruction of fish and wildlife habitats. This is especially important in light of the fact that all of the City's streams contain salmonids which may require further protection measures when listed as threatened or endangered species. How Maple Valley treats its waters today also affects its downstream neighbors.

Past mitigation measures have not always been adequate to protect these basins. In addition to mitigation measures and management plans that exist, this Plan will consider other mitigation measures effective in protecting sensitive drainage basins, including, but not limited to: close cooperation between cities and King County involved in basin planning, revision of stormwater standards, strict enforcement of critical areas ordinances and buffer areas, public involvement and education, and land use and zoning protection. This Plan should adopt by reference the highest applicable Surface Water Management standards. Also, some of the streams identified in Maple Valley have been *daylighted* (transforming a culvert stream to an open channel). Daylighting a stream has proven to be a successful way to restore an underground stream's function and value by bringing it back to the surface.

Environmental education programs will also help Maple Valley to reach its environmental preservation goals. Coordination with the Tahoma School District, as well as with utility districts on such programs as water conservation, wellhead protection programs, and other best management plans could prove to be very effective. Many resource protection and education programs are already in place in the region, and available to Maple Valley's government and citizens. King County offers surface water management advice, training, technical assistance and grant sponsorship to help communities monitor and manage lakes. For example, the impacts of surface water runoff and pollution can be reduced by establishing buffers of filtering native plants around lakes' shorelines and along banks of inflowing streams. Plants also prevent shoreline erosion, and improve fish and wildlife habitat. Developing adequate land clearing, grading, buffering and critical areas policies which protect these resources will be a key challenge to the Plan.

A limited number of residents still rely on private wells for their water supply. These wells rely on the surficial groundwater aquifer. As new development occurs adjacent to properties with private wells, measures should be in place to ensure that adverse impacts to existing wells from new development is avoided or mitigated, or those households on private wells are connected to the Cedar River or Covington Water District systems.



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Wellheads that are susceptible to aquifer contamination are of critical importance to protect. The City and the Covington Water District should work cooperatively to implement the State Wellhead Protection Program and the 1986 Federal Safe Drinking Water Act, which generally requires mapping wellhead protection zones and establishing an interagency wellhead protection plan. The City should work with the water districts to maintain proper management zones around public wells, to detect existing ground water contamination sources, and to manage potential sources of groundwater contamination prior to their entry into the drinking water system.

In summary, policies and regulations that protect and promote groundwater recharge, including wellhead protection programs, should be implemented. Since aquifer recharge areas overlap jurisdictional boundaries local cities, water districts and the County must work together to protect these resources.

SOILS AND TOPOGRAPHY

Soils and topography are important sources of information for determining the degree to which an area is susceptible to geologic hazards such as erosion hazard areas, landslide hazard areas, and seismic hazard areas. Steep slopes, coupled with certain soils and drainage characteristics, indicate potential areas of landslides and other geologic instability which can threaten the public health and safety.

Topography

The City lies in gently rolling terrain perched above the Cedar River Valley. Elevation ranges from 400 to 600 feet above sea level. Most of the geologic hazard areas are associated with the bluffs and ravines that run into the Cedar River Valley immediately north and east of the City.

Erosion Hazard Areas

Erosion hazard areas are those areas containing soils which have historically led to severe, or very severe, erosion hazard. Generally, these problems are either the result of historic poor grading and construction practices or are areas characterized by loose unconsolidated soils subject to scouring. Erosion Hazard Areas are present in Maple Valley. These are areas particularly prone to erosion activity located along the Cedar River or adjacent to and southwest of Lake Wilderness. It is recommended that development in these areas be either clustered, kept at low density, or avoided.

Landslide Hazard Areas

Landslide hazard areas are generally those areas subject to a severe risk of landslide, due to the following combination of factors:

1. Any area with a combination of:
 - a) Slopes 15 percent or greater; and



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- b) Impermeable subsurface material (typically silt and clay), frequently interbedded with granular soils (predominantly sand and gravel); and
- c) Presence of springs or seeping ground water during the wet season.
2. Steep slopes of 40 percent or greater.
3. Any areas located on a landslide feature that has shown movement during the past 10,000 years or which is underlain by mass wastage debris.

Landslide hazard areas are located north of the City boundaries and generally follow the bend of the Cedar River. A portion of the City extends into a landslide hazard area between the Cedar River Pipeline Road and the northern City limit in the area occupied by the gravel mining operation. The mining reclamation plans and future land uses for this area will need to be considered in light of this limitation.

Seismic Hazard Areas

Seismic hazard areas are those areas subject to severe risk of earthquake damage as a result of seismically induced settlement or soil liquefaction. These conditions occur in areas underlain by "cohesionless" soils of low density, usually in association with a shallow groundwater table.

The seismic hazard area in Maple Valley is associated with the Cedar River Valley, and extends into the northeastern portion of the City.

Soils

The geology of Maple Valley is largely the result of prehistoric glacial activity and subsequent ice retreats. The United States Department of Agriculture and the Soil Survey of King County mapped and analyzed the soils in the area. The most common soil type in the area is known as the Alderwood series, which includes moderately well drained, gravelly sandy loams that are 24 to 40 inches deep over consolidated glacial till. The next most common type is the Everett series. Everett soils are gravelly and are underlain by sand and gravel. In certain areas, principally basins and lowlands, organic materials, including peat, occur in depths up to ten feet.¹³

Planning Issues of Soil and Topography

The climb to Maple Valley's higher elevations from the Cedar River or Black Diamond brings a person to overlooks within the City which provide excellent views along forested greenbelts. Because of their desirability, these views are highly susceptible to development. However, these areas are also characterized by steep slopes with unstable soil layers prone to liquifaction or slide. According to Maple Valley citizens, these rolling forested greenbelts provide the aesthetic rural quality of life they prefer. If they are developed, Maple Valley could lose the very qualities that the residents hold dear.

¹³ Soos Creek Water and Sewer District: *1997 Sewer Comprehensive Plan*. p. 2-3.



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Mitigation measures available to prevent the degradation of the valley walls and greenbelts from clearing and development should include, but not necessarily be limited to: ordinances to protect vegetation and critical areas, mapping and protecting critical viewsheds, design standards for steep slopes and revegetation projects, and limitation of development in geologic hazard areas through land-use restrictions.

To be prepared for the hazards associated with severe seismic activity, Maple Valley should continue to update their Emergency Management Plan. This plan should include an earthquake disaster response element that assigns specific responsibilities to City officials in a seismic event, and should define the relationship between Maple Valley and other jurisdictions and their plans, and between Maple Valley and the Federal Emergency Management Agency. This plan should also identify structures in the City, which are particularly hazardous in these situations.

PLANTS AND ANIMALS

Maple Valley is known for its abundance of trees and freshwater lakes. Lake Wilderness, Pipe Lake, and Lake Lucerne provide habitat for a variety of plant and animal species. Wildlife habitats are very important to the community and the future of wildlife in the area. They are located throughout the community as pockets of open space, forested greenbelts, lakes, wetlands, trails, and stream corridors.

These features may be protected through a number of techniques ranging from site-specific land use restrictions, critical area regulations, Native Growth Protection Easements, or one of the many public open space protection programs such as King County's Public Benefit Rating System (PBRs).

Plant Life

Dense third-growth stands of Vine maple, Douglas fir, and Western hemlock are the most common plant community in Maple Valley. Much of the natural vegetation in Maple Valley consists of plant species associated with these lowland coniferous forests, including shrubs, herbs, and sedges. Meadows and wetland species are also common in Maple Valley.

Fish and Wildlife

Of the many species of fish and wildlife living in Maple valley, salmon are perhaps the most fragile and endangered. Both the Cedar and Green Rivers, and their tributaries, contain Chinook, Coho, and Sockeye Salmon. The National Marine Fisheries Service has listed several of these species as threatened or endangered under the Endangered Species Act. Lake Wilderness is managed for trout. Large and small mouth bass are also found in Lake Lucerne and Pipe Lake.

Considering that Maple Valley comprises the easternmost point of King County's urban growth boundary, it is not surprising that large mammals are commonly seen. Black bear have been sited



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recently near Lake Lucerne, and cougars live north and east of the City in the higher elevations. Deer and elk also frequent the City.

The designation of wildlife corridors is a successful way to manage and preserve wildlife. Maintaining these areas in their natural state reduces the threat of human intrusion. These animals usually only enter urban areas when their habitats are displaced by urban development. One wildlife corridor is located inside the eastern boundary of the Belmont Woods development between S.E. 244th and S.E. 248th Streets. This area, near the Rock Creek Natural Area, contains valuable wildlife habitat. (See Figure CF.1 in the Capital Facilities element.)¹⁴ Another much larger wildlife corridor, designated in the 1994 King County Comprehensive Plan, runs in a northeast to southwest direction immediately southeast of the Maple Valley city limits.

Small fur animals typically found in Maple Valley include opossum, skunk, and cottontail rabbit. Along waterways, it is not uncommon to find beaver, river otter, raccoon, and muskrat.

Common bird species include passerines, or perching birds, woodpeckers, waterfowl, and raptors. These birds may be either year-round residents or present during specific breeding, nesting, or migratory seasons. Typical passerine species would include sparrows, finches, grosbeaks and warblers, among others. Cavity nesting birds such as woodpeckers, tree swallows and nuthatches are typically present in the remaining forested tracts of land. Waterfowl include wood duck, common coot, Canada goose, mallard and mergansers. Other water- and wetland-dependent species include great blue heron, marsh hawk, and red-winged blackbird. The most common types of raptors include red-tailed hawk, osprey, bald eagle, and great horned owl.

Planning Issues of Plant and Animal Management

Maple Valley's natural environment warrants close consideration as the City continues to urbanize. Critical area regulations will be particularly important in protecting the functions of environmentally sensitive areas in the future. All of the City's critical areas, whether mapped in this element or determined in the future on a site-specific basis, should have their environmental functions protected from urban development, and adverse impacts mitigated.

Development pressures indicate that only strict mitigation measures will slow the degradation of plant and animal habitat. These mitigation measures should include, but not necessarily be limited to: residential and commercial design standards, vegetative protection requirements, land use and zoning restrictions, critical area regulations, incentives for open space and stream corridor preservation and revegetation projects, and public education and involvement programs.

Ground-disturbing projects require consultation with the City in order to reduce the cumulative impacts on natural resources. For example, the City of Maple Valley Zoning Code regulates clearing and grading along the edges of lakes or streams, within wetlands, or inside the buffer zones of these and other sensitive areas. Typically, buffers extend 25 to 100 feet from the outer edge of a sensitive

¹⁴ King County Assessor's Section Map.

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area. Approved permits are required for activities within these areas. Depending on the nature of the project, additional coordination may be required such as the Shoreline Management Master Program or clearing and grading permits.

Public and private land owners can achieve their common goal of open space, wildlife habitat and critical area preservation if they develop their plans together to provide continuous corridors and necessary links in the open space system. Where these reserves are located on private lands, incentives should be considered to protect highly valued forest tracts remaining in the City. King County offers an incentive to preserve open space on private property by providing a tax reduction if the land contains one or more open space resources. This tax incentive establishes a “current use taxation” property tax assessment for the approved open space land. This taxation is lower than “the highest and best use” tax assessment level that usually applies on most land. The reduction in taxable value ranges from 50 percent to 90 percent for the portion of the property in “current use.”¹⁵ There are other widely accepted financial incentives for preserving open spaces, streams and wildlife areas such as the Community Stewardship Grants which can be obtained from King County’s Water and Land Resources Division.¹⁶

¹⁵ The King County Current Use Taxation Program. Application can be obtained from the King County Department of Natural Resources.

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ENVIRONMENTAL QUALITY

Goals & Policies

GOALS & POLICIES

The goals and policies in this section provide the basis for Maple Valley to protect critical areas and natural features. In the past several decades, the quality of the natural environment has become an increasingly important consideration in developing Comprehensive Plans. The constraints of the landscape to development, and the environmental impacts associated with proposed development, should be evaluated before land is allocated to specific uses. This allows more detailed information to be gathered and analyzed at the building construction or permit application stages, thus more effectively determining the compatibility of the proposed use with the natural environment, the probable environmental impacts, and measures that can be employed to mitigate or reduce such impacts.

The most effective way to plan for a healthy environment in Maple Valley is to coordinate the planning of its interrelated components. Planning for the provision of one feature will likely improve the provision of another. For example, increasing the amount of vegetation in the community improves air quality. And improving air quality will encourage people to enjoy the parks and greenbelts, which they created.

Open Space

The main goal for open space planning is to create a Comprehensive Plan which links open space features of many kinds. These could wind through and between neighborhoods and commercial areas to link trails, habitat conservation areas, native growth protection easements, and vegetative buffers. (See the Capital Facilities element for a complete discussion of parks, trails and open space.)

Air Quality

Air quality is a growing problem in the Northwest. The automobile is the number one contributor of air pollution, and Maple Valley is a growing automobile-dependent community. Other sources of air pollution are wood-burning stoves, and certain commercial and industrial operations. The City should engage in efforts to reduce auto dependency by providing pedestrian trails, efficient public transportation, and education about carpools and trip efficiency.



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Goals & Policies

GOALS

- EQ-G1 Protect and enhance Maple Valley's natural environment, including air quality, water resources, natural features that contribute to the City's scenic beauty, and critical areas as defined by the GMA.
- EQ-G2 Manage the natural and built environments to protect, enhance, and sustain environmental quality, while minimizing public and private costs.
- EQ-G3 Promote community-wide stewardship of the natural environment to preserve environmental quality for future generations including environmentally friendly and energy efficient buildings and projects that promote water conservation and reuse as well as alternative energy resources.
- EQ-G4 Preserve significant areas of native vegetation along major roadways.

POLICIES

CRITICAL AREAS

- EQ-P1 The City should designate and protect the critical areas as mapped and adopted in the Maple Valley Comprehensive Plan, as well as coordinate with King County and adjacent cities for the long term preservation of surrounding natural areas, such as the Rock Creek Natural Area. Public access to critical areas for scientific, educational, and recreational use is desirable provided the public access trails are carefully sited, sensitive habitats and species are protected, and hydrologic continuity is maintained.
- EQ-P2 The City designates the following environmental features as "critical areas" in accordance with the State Growth Management Act:
 - a. Wetlands
 - b. Fish and wildlife habitat conservation areas, including lakes and streams
 - c. Areas with a critical recharging effect on groundwater used for water supply
 - d. Frequently flooded areas
 - e. Geologically hazardous areas, including erosion hazard areas, landslide hazard areas, and seismic hazard areas, (and coal mine hazard areas)

INCENTIVES, EDUCATION, PLANNING AND REGULATIONS

- EQ-P3 In addition to its regulatory authority, the City of Maple Valley should use incentives to protect or enhance the natural environment whenever practicable. Incentives may include

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buffer averaging, density bonuses, lower tax assessment for land preserved in open space (King County Public Benefit Rating System), and appropriate non-regulatory measures. Incentives should be monitored to determine their effectiveness. Additionally the City should promote water conservation, reclamation and reuse, renewable energy and alternative energy resources in all sectors.

- EQ-P4** The City should promote environmental stewardship by educating its citizens and establishing partnerships with other entities (e.g., the Tahoma School District) that share similar environmental concerns or stewardship opportunities.
- EQ-P5** The City should coordinate with its citizens and with other jurisdictions (federal, tribal, State, and local) in protecting and enhancing the natural environment.
- EQ-P6** The City should use acquisition, enhancement, incentive programs, and appropriate regulations to preserve critical areas as permanent open space where development may pose hazards to health, property, important ecological functions, or environmental quality.
- EQ-P7** Best available science should be included in the development of critical areas protection regulations to ensure the protection of critical areas functions and values.

AIR QUALITY

- EQ-P8** The City should reduce air pollution associated with land uses by:
- Requiring measures to minimize particulate emissions associated with land clearing and construction activities.
 - Promoting the use of clean-burning fuels
 - Educating people in the health risks and environmental effects of air pollutants, and what each person can do to improve air quality.
 - Encouraging the proper use of wood stoves and fireplaces.
 - Promoting land use patterns and public facility sitings that reduce the quantity and length of single-occupancy vehicle trips.

WATER RESOURCES**General Water Resources**

- EQ-P9** The City should coordinate the management of its surface water with other agencies who provide or impact the City's drinking water and wastewater treatment. This should include playing a responsible role in the Countywide effort to protect and enhance surface waters on a watershed basis by working with the State Department of Fish and Wildlife to analyze water quality and quantity problems and their impacts on fish and wildlife habitat, as well as to control stormwater runoff problems in the Soos Creek and Cedar River watersheds.
- EQ-P10** The City will seek to work cooperatively with King County Surface Water Management

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Division, the Washington Department of Ecology, and other affected jurisdictions and tribes to implement water quality management strategies and to comply with *Municipal National Pollutant Discharge Elimination System* regulations to address non-point pollution.

- EQ-P11** The City should use incentives, regulations, and programs to manage its water resources (groundwater, streams, lakes, and wetlands) and to protect and enhance their multiple beneficial uses, including flood and erosion hazard reduction, aesthetics, recreation, water supply, gardening, and fish and wildlife habitat. Use of water resources for one purpose should, to the fullest extent practicable, preserve opportunities for other uses.
- EQ-P12** Development should occur in a manner that maintains the ecological and hydrologic function of water resources based on pre-development quality and quantity measurements. This includes avoiding negative adverse impacts on water quality or water quantity. Surface water management facilities that use natural streams and lakes for storage should ensure that those natural features are not adversely impacted by their inclusion in the surface water system.

In addition to mitigation and management plans that exist, Maple Valley will consider other mitigation measures that are effective in protecting sensitive drainage basins including, but not limited to: close cooperation between cities and King County, revision of stormwater standards, strict enforcement of critical areas ordinances and buffer areas, public involvement and education, and land use and zoning protection.

- EQ-P13** The City should actively promote conservation of water resources. To the maximum extent practicable, water conservation measures (e.g., low-flow shower heads, lawn watering schedules) should be incorporated in new development, including City parks and other civic projects.
- EQ-P14** The City should continue to restrict stream relocation projects, the placing of streams in culverts, and the crossing of streams for both public and private projects. Where applicable in stream corridors, the City should give consideration to structures that are designed to promote fish migration and the propagation of wildlife habitat.
- EQ-P15** Erosion control measures should be used for grading and any work in or adjacent to stream or lake buffers.
- EQ-P16** Appropriate mitigation for detrimental impacts may be required for construction work within the buffer area associated with a stream channel or a lake. Furthermore, the City and project developer or water purveyor should work in cooperation with the Department of Fish and Wildlife through the Hydraulic Project Approval permit process for all development proposals which involve streams.
- EQ-P17** Essential public facilities and utilities may cross lakes where no other feasible alternatives exist. The amount of intrusion should be the minimum necessary to complete the project.

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Groundwater

- EQ-P18** The City should take into account the potential impacts of its land use actions on aquifers that serve as potable water supplies. The depletion or degradation of aquifers needed for potable water supply should be avoided. Otherwise, if the *potential* for aquifer contamination is identified, a detailed mitigation plan should be developed and implemented to compensate for the potential lost supply. Water contamination potential will be determined through coordination with King County's Water and Land Resources Divisions' clean water program.
- EQ-P19** The City should protect groundwater recharge quantity by promoting methods that infiltrate runoff where site conditions permit, except where potential groundwater contamination cannot be prevented by pollution source controls and stormwater pretreatment.

Streams

- EQ-P20** Stream channels should be protected and restored, where possible for their hydraulic and ecological functions, as well as their aesthetic value. Stream channels should not be diverted through culverts or undergrounded for excessive distances unless absolutely necessary for property or utility access and where no other alternative can be reasonably implemented. Where culverts are used, the installation and type of culvert should allow passage by, and not be injurious to, migratory fish.
- EQ-P21** When development or redevelopment is proposed on property that contains streams that have been degraded, contained in culverts, channelized or undergrounded, streams should be restored, daylighted and/or natural functions improved to the maximum extent possible.
- EQ-P22** The City, in partnership with King County and other jurisdictions, should promote restoration of stream channels and associated riparian areas to enhance water quality and fish and wildlife habitat and to mitigate flooding and erosion. The City should encourage such restoration as a condition of development adjacent to streams.
- EQ-P23** The City should require vegetative buffers of developments to protect the ecological functions and habitat associated with streams. Greater protection should be provided to streams that are used by salmon during any part of their life-cycle. Native vegetation should be protected or planted wherever possible.

Lakes

- EQ-P24** The City should protect Lake Wilderness, Pipe Lake, and Lake Lucerne through management of their watersheds and shorelines, including management of nutrients that stimulate algae growth and aquatic plant growth. The City should work with King County,

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the Lake Wilderness Management District, adjacent jurisdictions, special purpose districts, and other interested citizens in the preparation of management plans for the lakes, including the existing noxious weed eradication projects.

EQ-P25 The City should utilize its Shoreline Master Program as one implementation measure for the protection of the City's lakes.

EQ-26 Lakes should be protected and enhanced by proper management of watersheds and shorelines, by improvements in water quality, by removal of invasive plant species, and by restoration of fish and wildlife habitat.

Wetlands

EQ-P27 The City should work with King County, the State, and other jurisdictions, tribes and citizen groups to utilize the most current and appropriate Countywide wetlands policies and classification system. Standards for delineating wetlands should use scientifically accepted technical criteria and field indicators which meet, at minimum, the most current *Washington State Wetlands Identification and Delineation Manual*.

EQ-P28 The City's overall goal for the protection of wetlands is, by requirement, *no net loss of wetland functions or values within each drainage basin*. **Wetland functions** are natural processes performed by wetlands. Wetlands promote food chain production, provide fish and wildlife habitat, maintain and improve water quality, retain water for recharge and discharge into groundwater aquifers, moderate surface water and storm water flows. Other functions include, but are not limited to those discussed in U.S. Army Corps of Engineers regulations (33 CFR 320.4(b)(2), 1988). **Wetland values** are estimates, usually subjective, of the benefits of wetlands to society, and include aesthetics, education, scientific research, and recreation.

EQ-P29 Acquisition, enhancement, and incentive programs should be used independently or in combination to designate wetlands as permanent open space, and to protect and to enhance wetland functions.

EQ-P30 Development adjacent to wetlands should be sited such that wetland functions are protected, an adequate buffer around the wetlands is provided, and significant adverse impacts to wetlands are prevented or mitigated.

EQ-P31 Alterations to wetlands should be allowed to:

- a. Accomplish a public agency or utility development, utilizing the necessary mitigation measures as detailed in the agency's or utility's approved Best Management Practices Plan
- b. Provide necessary utility and road crossings, utilizing the necessary mitigation measures as detailed in the agency's or utility's approved Best Management Practices Plan

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- c. Avoid denial of reasonable use of the property, provided that all wetland functions are evaluated, the least harmful reasonable alternatives are pursued, and affected significant functions are appropriately mitigated
- d. Otherwise modify property for development only in compliance with the City's wetland regulations and policies

- EQ-P32** Public access to wetlands for scientific, educational, and recreational use is desirable, provided the public access trails are carefully sited, sensitive habitats and species are protected, and hydrologic continuity is maintained.
- EQ-P33** Wherever possible, areas of native vegetation that connect wetland systems should be protected, preferably through incentives and appropriate non-regulatory mechanisms.
- EQ-P34** Mitigation proposals for wetland functions lost due to development should replace or enhance the lost functions. The goal for these mitigation projects should be no net loss of wetland functions per drainage basin. Mitigation sites should be located strategically to alleviate habitat fragmentation.
- EQ-P35** Mitigation projects should contribute to an existing wetland system or restore an area that was historically a wetland. Where restoration or enhancement of an existing degraded wetland system is proposed, it must result in a net improvement to the functions of the wetland system.
- EQ-P36** The should provide flexibility in its wetland mitigation requirements to allow for protection of systems or corridors of connected wetlands. A tradeoff of small, isolated wetlands in exchange for a larger connected wetland system can achieve greater resource protection and reduce isolation and fragmentation of wetland habitat.
- EQ-P37** Developers of projects for which wetland mitigation is required should provide monitoring and maintenance until the success of the site is established. Land used for wetland mitigation should be preserved in perpetuity. If conditions change such that wetlands can no longer be maintained on the land, it should be preserved as open space.

Floodplains

- EQ-P38** Any floodplain land use and floodplain management activities should be carried out in accordance with the *King County Flood Hazard Reduction Plan* or its successor.

VEGETATION

- EQ-P39** Lakes should be protected and enhanced by proper management of watersheds and shorelines, by improvements in water quality, by removal of invasive plant species, and by restoration of fish and wildlife habitat.
- EQ-P40** The use of native plants should be required in landscaping and erosion control projects, and in the restoration of stream banks, lakes, shorelines, and wetlands.



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EQ-P41 The City should adopt vegetation protection standards to implement its goals of preserving native plant species, forested greenbelts, and maintaining a healthy environment. This approach would outline guidelines and standards to follow for the retention of trees, the preservation of forested lots, and incentives for implementation, especially along major roadways.

FISH AND WILDLIFE HABITAT

EQ-P42 The City should strive to maintain habitats that support the greatest diversity of fish and wildlife species consistent with the City's land use objectives. Fish and wildlife habitat should be maintained through conservation and enhancement of terrestrial, air, and aquatic habitats, preferably in open spaces and sensitive areas.

EQ-P43 Habitats for species which have been identified as endangered, threatened, or sensitive by the State or federal government should not be reduced and should be preserved. When development is proposed that is adjacent to or likely to adversely impact habitat, the proponent should be required to assess the impacts of the proposal on the habitat and provide measures necessary to minimize or avoid any adverse impacts on these areas. Stream and wetland buffer requirements may be widened to protect such habitats, as appropriate. Whenever possible, density transfers, and/or buffer averaging should be allowed.

EQ-P44 Salmonid habitats located in regulated shoreline areas should be protected in accordance with the Maple Valley Shoreline Master Program.

EQ-P45 The City should be a good steward of public lands, and should incorporate fish and wildlife habitats into capital improvement projects whenever feasible.

GEOLOGIC HAZARD AREAS

Steep Slopes, Erosion and Landslide Hazard Areas

EQ-P46 Land uses and development on or near steep slopes should be designed to prevent property damage and environmental degradation, and to enhance open space and wildlife habitat consistent with adopted zoning and building regulations. In general, as slope increases, development intensity, site coverage, and vegetation removal should decrease and thereby minimize drainage problems, soil erosion, siltation, and landslides. Slopes of 40 percent or more should be retained in a natural state, free of structures, and other land surface modifications.

EQ-P47 Grading and construction activities should incorporate erosion control Best Management Practices and other development controls as necessary to reduce sediment discharge from



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construction sites to minimal levels. Development controls should include seasonal restrictions on clearing and grading.

EQ-P48 Land uses permitted in Erosion and Landslide Hazard Areas should minimize soil disturbance and maximize retention and replacement of native vegetative cover.

EQ-P49 Landslide Hazard Areas and areas with slopes of 40 percent or greater should not be developed unless the risks and adverse impacts associated with such development can be reduced to a negligible level.

Seismic Hazard Areas

EQ-P50 In areas with severe seismic hazards, special building design and construction measures should be used to minimize the risk of structural damage, fire, and injury to occupants during a seismic event and to prevent post-seismic collapse.