CHAPTER 4
ENVIRONMENTAL ELEMENT

INTRODUCTION

Clark County contains a diverse mixture of natural resources, parklands, and open spaces. Of the county's 656 square miles, almost half is in forest and agricultural lands, and surface water. Air, water and land resources are essential to the very existence of human development. They influence every aspect of quality of life, from the local climate to the availability of safe drinking water to flood control and drainage patterns to recreational opportunities and to the habitat that we share with plants and animals.

The Environmental Element provides specific environmental goals and requirements as the basis for development regulations and general goals for land use planning and parks acquisition. The Environmental Element addresses land development throughout the entire unincorporated area of the county, and includes various environmental policies that apply to the entire county.

RELATIONSHIP OF THE ENVIRONMENTAL ELEMENT TO OTHER ELEMENTS AND PLANS

The Growth Management Act (GMA) recognizes that environmental protection is important to the citizens of the State of Washington. The GMA contains three goals that relate to the natural environment:

- **Environment** This goal requires protection of the environment and enhancement of the state's high quality of life, including air and water quality, and the availability of water.

- **Open Space and Recreation** This goal encourages the retention of open space, the development of recreational opportunities, the conservation of fish and wildlife habitat, increasing access to natural resource lands and water and the development of parks. (See Chapter 7 for a more complete discussion of county parks, recreation and open space.

- **Natural Resource Industries.** This goal requires the maintenance and enhancement of natural resource-based industries, including productive timber, agricultural, and fisheries industries. The conservation of productive forest lands and productive agricultural lands is encouraged, while incompatible uses are discouraged. (See Chapter 3 for a more complete discussion of the county's natural resource industries).

All development activities create some level of impact on the air, water and land resources of the county. The benefits of development activities are easily measured in terms of economic benefits to the county or its cities. However, there are often unintended consequences of development that are not included in the environmental balance sheet. It is these consequences that are addressed through the programs and policies in the Environmental Element.

The ultimate goal is to recognize the functions and values of the natural environment around us and to maintain or improve those functions and values, independent of the type of development that is proposed. The Environmental Element of the 20-Year Plan is important because protection and enhancement of our environment has the potential to conflict with other 20-Year Plan elements.

ENVIRONMENTAL CONDITIONS AND CONSERVATION PROGRAMS

Critical Areas

The GMA specifically lists five "critical areas" that counties must designate and develop protection and enhancement programs for. These five are fish and wildlife habitat, wetlands, aquifer recharge areas, floodplains, and geologically hazardous areas. Protection of critical areas and resource lands is a key goal and purpose of the GMA, and is a longstanding goal of the Clark County community. The county contains a variety of critical areas, ranging in size and scope from smaller, discrete areas which provide habitat for threatened, sensitive or endangered wildlife species, to broadly based aquifer recharge areas, which encompass most of the undeveloped land area within the county. Many types of critical areas geographically overlap. The soils and terrain in the rural and resource areas create significant environmentally sensitive areas, such as steep, erodable slopes, wetlands and ground water recharge areas.

The benefits that these critical areas yield range from providing wildlife or vegetative ecosystem habitat, to limiting or mitigating human concerns such as water pollution or flood hazards. Vegetation retention is critical to protecting streams and riparian habitat necessary for sustaining healthy fish and wildlife populations. Critical areas also provide the benefits of recreation, aesthetic enjoyment and water supplies. Maintenance of tree cover, natural vegetation and wetlands are critical to prevention of erosion, flooding, property and habitat damage, the continued functioning of the ecosystem and preservation of rural character.

Unlike residential, commercial, industrial, or other uses, critical areas do not typically constitute a separate 20-Year Plan or zoning designation, unless they are under public ownership. Policies and programs used to protect and conserve these areas involve a range of federal, state, and local programs and standards. Most policies used to address critical areas are therefore regulatory or incentive-based and are applied to privately held lands (Figure 1).

One effective way of protecting critical lands is through public ownership. Publicly owned lands within the urban area are largely confined to parks which emphasize recreational opportunities. Outside urban areas, most publicly owned lands emphasize wildlife and other critical land values, although access and passive recreation may be allowed. Protecting sensitive lands through public ownership requires that substantial funds be raised for acquisition and maintenance of the land.

Prohibitions or limitations on structural development also provide critical lands protection. Such programs currently in place in Clark County include the Shoreline Master Program; floodplain, wetlands and habitat conservation ordinances; and prohibitions against placement of structures within designated unstable slope areas. As part of the development

review process, the State Environmental Policy Act (SEPA) authorizes the imposition of a wide range of conditions which can prohibit or limit construction within certain areas or enact other mitigation measures to protect environmentally sensitive areas.

Fish and Wildlife Habitat

Most of the land and water area of Clark County provides some form of potential fish or wildlife habitat. Much of this area is in park land, resource production, or open space. Clark County has several hundred miles of streams and rivers. Under state and federal law, these streams are designated to support a wide range of "beneficial uses" that include water supplies, fish and wildlife habitat, and recreation. The ability of these streams to meet these beneficial uses is more generally considered stream health. Stream health has not been comprehensively measured for all streams in the county, and much of this work is underway but not yet complete. Available data on stream health shows that streams range from near pristine conditions in remote areas of the Cascade Foothills to fair to poor health in urban areas. Most rural streams could be categorized as being in fair to good health.

There are few lakes in Clark County. Aside from small manmade ponds and seasonal wetland ponds, the only significant lakes within or bordering the county are Vancouver Lake, Battle Ground Lake, Lacamas Lake, Shillapoo Lake, Mud Lake, Lake Merwin and Yale Lake. These areas provide essential habitat for a variety of fish, wildlife and plant species.

Clark County has critical habitat for several species listed under the federal Endangered Species Act. Those listed as endangered include upper Columbia River Chinook salmon and steelhead, Snake River sockeye salmon, the Northern spotted owl, and the Aleutian Canada goose. Species listed as threatened include several salmon runs, bull trout, and the bald eagle. In addition, Clark County is habitat for several state listed species, including the western pond turtle and sandhill crane.

Fish of the lower Columbia River are either resident or migratory species. Most migratory species, such as salmon, shad, smelt, and steelhead, are anadromous, meaning that they hatch in freshwater, migrate to the ocean as fry, mature in the ocean and then return to freshwater streams to spawn. In addition to critical areas, the GMA requires that local jurisdictions address the requirements of anadromous fish species. There are some resident species, such as sturgeon, whitefish, and resident trout, that migrate long distances within freshwater streams to feed or spawn.

Certain areas of critical habitat are readily identifiable because of their protected status under public ownership. The Ridgefield National Wildlife Refuge contains over 5,000 acres of Columbia River floodplain, consisting of marshes, lakes, woodlands, grasslands and croplands, which provide migration and wintering habitat for Pacific Flyway waterfowl, as well as many species of water birds, raptors, shore and songbirds. The concentration and diversity of native and migratory bird species in the Refuge are the largest in the county; and includes sandhill cranes, a state endangered species. Several species of mammals, reptiles and amphibians can also be found in the Refuge.

Steigerwald Lake National Wildlife Refuge, located in the southeast corner of the county, includes 627 acres of Columbia River bottomland, consisting of reed canary grass marshes, riparian woodlands and improved pastures. Among the species inhabiting the Refuge are raptors, geese, and marsh, water, and riparian woodland songbirds. The Vancouver Lake lowlands area provides over 1,000 acres of wildlife habitat within close proximity to Vancouver. Much of this land is owned by the Washington State Department of Fish and Wildlife, which has prepared a management plan to determine how the land will be used.

Wildlife habitat is not restricted to those areas already under public ownership. Riparian corridors and other areas adjacent to or including surface water bodies clearly provide the most wide ranging and significant wildlife habitat. The Washington State Department of Fish and Wildlife has identified 36 sites within the county providing game, non-game or fish habitat; of which, 33 are along riparian corridors or other water bodies. Their program provides management recommendations for both priority species and habitat (Figure 2).

Fish and Wildlife Habitat Conservation Programs

The county's habitat conservation ordinance (CCC Chapter 40.440) was adopted in 1997 and was the result of an effort to strengthen the protective measures contained in the old vegetation clearing regulations. The stated purpose of the ordinance is to protect environmentally distinct, fragile and valuable fish and wildlife habitat areas for present and future generations while also allowing for reasonable use of private property.

Endangered Species Act

Congress passed the Endangered Species Act (ESA) in 1973. It requires the recovery of species that are listed as threatened or endangered. Clark County currently has populations of salmonids that are listed as threatened with extinction under the ESA.

Steelhead were listed in March 1998; Chinook and chum in March 1999. Coastal cutthroat are also currently proposed for listing as threatened. Protecting, conserving and enhancing critical stream and riparian habitat are essential to supporting and recovering salmonid populations throughout the county.

States, counties, and other jurisdictions must comply with the federal Endangered Species Act when species are listed by avoiding harm to any member of the species or the habitat upon which they depend. County policies and regulations must support recovery of those species. The goal is to make Clark County a county where sustainable populations of salmon and other native species are a testimony to a healthy ecosystem; where our well-being is supported by the integrity of the ecosystem we share with other living species; and where, by ensuring healthy habitat for all inhabitants of Clark County, we ensure the quality of life we value. The state has adopted the "Statewide Strategy to Recover Salmon, Extinction is not an Option" document as a guide to statewide salmon recovery efforts.

Subject to federal review and approval, an assessment protocol will be developed to predict when the individual or cumulative effects of land uses might cause a significant negative impact on the environment. The protocol will identify natural watershed-wide processes, their inter-relationships reach by reach, and how they might be degraded by human activities. The protocol will be designed to associate the watershed processes with the various environmental mandates imposed by the state and federal governments on Clark County and the jurisdictions within it. The use of a standardized assessment protocol may streamline permitting, promote efficient monitoring and focus restoration and mitigation projects.

In addition, land use planning will also accommodate state and federally listed wildlife species. Protecting and enhancing critical upland habitat is essential to supporting and recovering terrestrial wildlife populations throughout the county.

Water Quality

Clark County has an abundance of streams and groundwater supplies. Groundwater aquifers are capable of providing huge amounts of water to industry, business, residences and agriculture. The federal Clean Water Act lists the "beneficial uses" of the United States' rivers, streams and lakes. Many beneficial uses are features valued in Clark County and are required to protect and restore under the National Pollutant Discharge Elimination System (NPDES) municipal stormwater permit. These are:

- Surface water supply for **i**ndustrial water supply, agricultural water supply, domestic water supply, and stock watering;
- fish and wildlife production and habitat, including spawning, rearing, migration, and harvesting;
- recreation and enjoyment, including contact recreation (swimming, wading, etc.), non-contact recreation (boating and sport fishing), and aesthetic enjoyment; and
- commerce and navigation.

Urbanization influences stream biological health. The Washington Department of Ecology Stormwater Management Manual for Western Washington (August 2001) describes the effects urbanization has on water bodies. It states that before forests were cleared for farms and towns, rainfall was largely absorbed into the ground, later replenishing streams

as springs and seeps. As settlement occurs, trees are removed and replaced by fields, buildings and roads. Instead of soaking into the ground and returning to streams as springs, rainwater runs off rapidly and greatly increases stream channel erosion and degrades stream habitat. During the summer, stream flow may be reduced to low levels because less water is available to springs and seeps that feed the stream. The manual also states that along with changing stream flows, urbanization adds various pollutants to surface water and groundwater.

The combination of increased runoff and pollutants in stormwater runoff drastically alter stream habitats. Pesticides washed off landscaped areas can do great harm to aquatic insects that feed fish. In recent years, some areas have identified methods to reduce the harm to streams caused by urbanization. One tool is engineered stormwater controls such as large detention ponds to slowly meter out storm runoff and grassy swales to trap pollutants. More recently, research has focused on protecting streams by not removing forest and soils during development and retaining a relatively high proportion of the stream drainage are in forest. Other techniques involve designing projects so that runoff is drained into vegetated areas where it can infiltrate to groundwater.

It has also been recognized in recent years that stormwater (non-point) runoff degrades streams by flushing pollutants from roads, businesses, industrial facilities, and residences. The volumes of water running off paved area also wash away streambed sediments and the creatures that live there. In order to begin to address this problem, a set of regulations was added to the Clean Water Act in 1987 to decrease problems caused by stormwater runoff. The Clark County Stormwater Management Program is a direct response to that mandate.

Clark County performs many activities to meet requirements of a Washington Department of Ecology permit to discharge stormwater to county water bodies and groundwater. The program is broken into five program elements:

- regulatory,
- operation and maintenance of storm sewers and roads,
- monitoring, data management and evaluation,
- public involvement and education, and
- stormwater capital improvements.

The regulatory program element is largely implementing development regulations requiring stormwater control facilities such as ponds and swales for development projects. It also includes enforcement of other water quality ordinances that address everyday activities such as proper disposal of used motor oil and vehicle wash water.

The operation and maintenance program involves maintenance and repair of county stormwater controls such as ponds and grassy swales, cleaning of catch basins, and sweeping of roads. The purpose is to reduce the amount of pollutants from discharged from the system and to make sure it operates as designed. The program also includes a program to inspect and ensure that privately operated stormwater facilities are properly cleaned and maintained.

The NPDES stormwater program also monitors stream health and works to characterize stream health for the entire county. This information helps target projects to

improve water quality and inform the public about stream health. The program also gathers and manages data describing the storm sewer system and its outfall points.

Reducing stormwater pollution requires that individuals prevent their homes and businesses from becoming pollution sources. For that reason, information and education is a major part of the stormwater program.

Much of the county was developed without stormwater control facilities to prevent pollution and excessive amounts of runoff from harming streams. Ultimately, the stormwater program is expected to build stormwater control facilities and stream restoration projects to address the short fall in stormwater control facilities. The program is beginning to plan and build projects using stormwater fees from each home, business and government property in unincorporated Clark County.

Erosion and sediment from land-disturbing activities affect public health, safety, and general welfare. Whereas erosion and sediment are not always related to steep slopes and landslide potential, they can be detrimental in the following ways:

- Increase the risk of flooding because streams and stormwater facilities that receive excessive sediment have a reduced capacity to convey water;
- Damage fisheries when siltation clogs spawning gravel and when excessive turbidity impairs the feeding ability of aquatic animals;
- Increase public expenditures for maintenance of stormwater facilities that receive excessive amounts of sediment;
- Damage adjacent properties, including public right-of-ways, when sediment is deposited on these properties; and
- Promote transport of nutrients to lakes causing algal blooms and oxygen depletion.

To minimize erosion from land development and land-disturbing activities, the county adopted an erosion control ordinance (CCC Chapter 40.380) in July 1993. In July of 1999, the Washington Department of Ecology issued Clark County an NPDES and State Waste Discharge permit. This permit required the county to adopt more stringent erosion control regulations (CCC Chapter 40.380).

In August 2001, the Department of Ecology published its Stormwater Management Manual for Western Washington. Renewal of the county's existing NPDES permit will require an update to the county's Stormwater and Erosion Control Ordinance for substantial equivalence with the new manual.

Wetlands

Wetlands provide valuable wildlife habitat and include marshes, swamps, fens and bogs that perform several other functions. Wetlands can aid hydraulics by moderating water overflow, advancing groundwater recharge, and enhancing water quality. Water quality is enhanced by preventing erosion, removing sediments and filtering nutrients and other pollutants from runoff, and slowing down the flow of water which allows time for pesticides and other chemicals to break down. Wetlands may also provide vegetative habitat and human recreational and open space amenities.

Some mapping of the highest quality wetlands in Clark County has been completed. County-wide mapping covering the full range of wetland classes is available in very generalized form through National Wetland Inventory and hydric soil mapping; these inventories are inaccurate on a site-specific basis. More precise wetland boundaries are not usually known until site specific analyses are conducted, normally during the review of individual development proposals. Most wetland areas are in low elevations areas within relatively close proximity of rivers and streams, or associated floodplains (Figure 3 and Figure 4).

Wetlands Conservation Programs

The county's wetland protection ordinance (CCC Chapter 40.450) was adopted in 1992 and significantly updated in 2000. The stated purpose of the ordinance is to:

- further the goal of no net loss of wetland acreage and functions;
- encourage restoration and enhancement of degraded and low quality wetlands;
- provide a greater level of protection for higher-quality wetlands;
- maintain consistency with federal wetland protective measures;
- avoid over-regulation by limiting regulatory applicability to those development proposals which significantly impact important wetlands; and,
- minimize impacts of wetland regulation on private property rights.

The county has a classification system that rates wetlands from Category 1 to Category 5 based on their characteristics. Development proposals involving wetlands often need review by the Army Corps of Engineers (under Section 404 of the Clean Water Act) and the State Department of Ecology.

Wetlands Mitigation Banking

Wetlands mitigation banking is a method of mitigating a decrease in or loss of wetland function by providing wetland functions and values (e.g. creating, restoring, enhancing and/or protecting wetlands) away from the site of a proposed development project. A wetland mitigation bank generates credits that can be used for wetland mitigation for individual projects with wetland impacts. Mitigation banking has a number of benefits over other mitigation strategies including:

- consolidation of small isolated mitigation projects into larger, more ecologically significant sites;
- higher likelihood of long-term mitigation success; and,
- efficiency in permit review for projects using bank credits.

Wetland Mitigation Banking is not a means of reducing the protection and conservation of wetlands in the urban area. It is only a method to improve mitigation success at a regional scale and streamline permit review for projects that have wetland impacts. The criteria used to evaluate and permit wetland impacts are independent of the type of mitigation proposed and, instead, focus on the benefits and design of the project. A key element to developing an effective wetland mitigation banking program is to maintain a good inventory of existing and historic wetlands in order to allow mitigation bank developers to locate sites that are well suited to bank development. Another key element is to ensure

that the wetland permitting process gives due consideration to the use of mitigation bank credits when they are available. State regulations have been proposed for the program, and the county will pursue a program when the regulations are finalized.

Aquifer Recharge Areas

An aquifer is a body of rock (generally sand, gravel, or fractured basalt in Clark County) that transmits groundwater in useable quantities to wells. Almost all of the county's industrial water needs and about 47 percent of public water needs are met by wells located near the Columbia River, where the overlying deposits consist mostly of coarse sand and gravel. Water infiltrates the soil and percolates through surface rocks into the water table, and then travels deeper downward into aquifers, which are water sources in most parts of the county. Recharge of aquifers is often greatly reduced in urban areas because most surfaces are impervious, preventing rainfall from entering the soil. Some aquifer recharge occurs in urban areas through dry wells and septic system drain fields, but these methods may decrease groundwater quality by allowing contaminants to enter the soil.

Since much of the county is covered with permeable alluvial, or sand, gravel, and silt deposits, there is no one identifiable point of recharge, and virtually the entire county pervious area may function as an aquifer to a certain extent. In the county, entire aquifers may function as an aquifer recharge area. The most critical aquifer recharge areas are those located near production wells. (Figure 5 and Figure 6)

Aquifer Protection Programs

Clark County residents and commerce are almost totally dependent on water pumped from relatively shallow aquifers. Both the quantity and quality of this water is critical. The county has several programs to protect aquifer recharge amounts and water quality.

The Stormwater and Erosion Control Ordinance (CCC Chapter 40.380) for development projects require stormwater infiltration wherever soil conditions make it feasible. This preserves recharge when sites are covered with buildings and pavement. Stormwater regulations also require that this infiltrated stormwater be treated to remove pollutants.

The Water Quality Ordinance (CCC Chapter 13.26A) prohibits discharging pollutants to surface water and groundwater. The county implements the ordinance by actively educating businesses and the public on acceptable ways to manage everyday pollutants such used oil, paint and dirty wash water.

The Critical Aquifer Recharge Area Ordinance (CCC Chapter 40.410) identifies critical areas and places special requirements on higher risk development projects in those areas.

Source-based policies are typically used to provide protection to larger and less clearly defined critical areas, such as aquifer recharge areas, or to address other concerns related to ground or surface water quality. Sewage regulations, particularly those regarding septic system uses, are administered by the Clark County Department of Health, and are directed toward the protection of critical areas which are not necessarily at the site of the potential pollutant source. Stormwater management policies and programs administered by

Clark County are similarly intended to address potential adverse water quality impacts beyond the source site.

Floodplains

Another critical area associated with riparian corridors are floodplains. Floodplains are defined and delineated by the Federal Emergency Management Agency (FEMA) to include all areas subject to flooding at 100-year intervals. This definition encompasses areas along most rivers in the county. In addition to the wildlife habitat and hydraulic functions that floodplains serve because of their location, building limitations in these areas limit damage to persons and property from the periodic floods (Figure 5).

Floodplain Protection Programs

Flood and erosion control is an integral part of land zone changes and building ordinance updates in the most recent urban boundary update areas, which are incorporating many vulnerable environmentally critical areas. It is recognized that approximately 90% of all disasters in the US are flood related. The National Flood Insurance Program (NFIP) was created by Congress in 1968, and significantly amended in 1973 to:

- reduce loss of life and property caused by flooding;
- reduce rising disaster relief costs caused by flooding; and
- make federally-backed flood insurance coverage available to property owners.

The program was designed to achieve these goals by:

- requiring that new and substantially improved buildings be constructed to resist flood damages;
- guiding future development away from flood hazard areas;
- transferring the costs of flood losses from the American taxpayers to floodplain property owners through flood insurance premiums; and
- prohibiting new development in designated floodways that would aggravate flooding.

The National Flood Insurance Program is a voluntary program based on mutual agreement between the federal government and the local community. In exchange for adopting and enforcing a flood plain management ordinance, federally-backed flood insurance is made available to property owners throughout the community.

The National Flood Insurance Act of 1968 created the Federal Insurance Administration and directed it to conduct Flood Insurance Studies (FIS) that identify flood-prone areas within the US, and establish and map flood risk zones within those areas. The studies provide technical data for the adoption of floodplain management measures required for NFIP participation by a community and for development of flood-risk information needed to establish flood insurance premiums.

In March of 1977, the county adopted a flood plain management ordinance (CCC Chapter 18.327). Of the county's 86 Flood Rate Insurance Maps (FIRM), more than half were prepared in 1982. Nearly 90% of the maps are dated prior to 1986. Clark County, in partnership with FEMA is currently working on updating these flood maps and expects to

complete this work within the next 2 to 5 years depending on federal funding availability. Recent changes were made to (CCC Chapter 40.420) at the suggestion of DOE to bring the ordinance into compliance with federal requirements.

Geologically Hazardous Areas

Geologically hazardous areas are not environmentally-valued critical areas such as wetlands or wildlife habitat, even though many contain critical fish and wildlife habitat protected by other ordinances. The primary function of development limitations within geologically hazardous areas is to limit potential adverse impacts to persons and property. The primary geologically hazardous areas are those of steep and or unstable slopes, which are often, but not exclusively, found along the stream corridors. (Figure 7 and Figure 8).

Geohazard Protection Programs

The county's Geologic Hazard Areas Ordinance was enacted in 1997 (CCC Chapter 40.430). Maps have been produced showing earthquake potential and steep slopes with the susceptibility to landslides and erosion. Seismic hazard vulnerabilities throughout the county are to be mapped and updated, utilizing new science technology in the identification of specific types of seismic activity, and the damages that could occur. New, more stringent and relevant seismic codes will be incorporated into the permitting and building ordinances as necessary.

Other Hazard Mitigation Programs

Natural hazards (such as floods & landslides, earthquakes, winter storms and wildfires) to Clark County's natural resources, parklands and other environmentally critical areas cause millions of dollars of damage every year. The Federal Emergency Management Agency (FEMA), working collaboratively with the State of Washington Emergency Management Division, the county, and its jurisdictions have been designated a Project Impact Community with grant initiative monies coming from Congress. The Project Impact initiative is a comprehensive natural hazard mitigation program aimed at Building Disaster Resistant Communities throughout the nation. This initial public education/awareness program is short term, but the principals and lessons are of such value they are to be incorporated into the ordinances and codes of the county in order to make natural hazard mitigation a sustainable part of everyday life.

The inclusion of lessons and methods of natural hazard mitigation that have been identified in order to safeguard the county's natural resources, are an important part of the 20-Year Plan. The county and its incorporated jurisdictions will include proven mitigation steps as one of the primary methods of alleviating damages from future natural disaster hazards. The programs and techniques for hazard mitigation are to be enforceable, sustainable and maintainable for the protection of the land and its residents.

Other Designated Areas

Shorelines

The shorelines of rivers, streams, and lakes of Clark County are important and sensitive natural resources, and encompass other critical areas such as wildlife areas, wetlands and flood areas. They provide habitat, drainage, recreational opportunities,

transportation and economic opportunities, some of which may conflict with each other. The State Shoreline Management Act of 1971 (SMA) defines shorelines as being within 200 feet of the ordinary high water mark or associated wetlands of all rivers with mean annual flow of 20 cubic feet per second (cfs) or more, or lakes greater than 20 acres in size. This definition encompasses the majority of shorelines for most of the rivers and lakes within Clark County, although shorelines of smaller water bodies also provide many of the same functions.

Clark County's Shoreline Master Plan was prepared in 1974. The Department of Ecology is in the process of developing new shoreline rules, and when they are issued the county will update its master plan.

Columbia River Gorge National Scenic Area

Clark County contains a variety of scenic areas, typically located near major river systems. The most prominent is in southeast corner of the county, where approximately 6,000 acres east of the City of Washougal was designated by Congress as part of the Columbia River Gorge National Scenic Area (NSA) in 1986. From 1988 to 1996 specific land use regulations intended to foster the scenic, natural, cultural and recreational functions of these and other similarly designated areas within the Gorge were administered by the US Forest Service and an appointed Columbia River Gorge Commission and staff. In 2002, Clark County adopted an implementing ordinance, which was deemed consistent with the management plan for the NSA by the Gorge Commission and the Secretary of Agriculture. This approval allows for county administration and jurisdiction over these lands.

Gorge Commission staff are in the process of updating the gorge management plan, and this may result in changes to the Clark County implementing ordinance, (CCC Chapter 40.240). An additional effort underway in the NSA is a program to improve air quality in the gorge.

Regional Conservation and Greenway Systems

Regional Conservation and Greenway Systems are the "resource-based" open space land types identified in the Clark County Open Space Commission Final Report (August 1992). The Open Space Commission identified 17 functions for open space that were divided into economic, resource, urban-based and other categories, and subsequently identified a number of "open space categories" as being of greater importance including the following:

- river systems and associated flood plains, which provide low-intensity recreation, natural vegetation, shore-lines, fisheries, and wildlife habitat (for example, the North and East Forks of the Lewis River, Lacamas Lake and Creek, Washougal River, Burnt Bridge Creek, and Salmon Creek);

- Columbia River lowlands, providing benefits similar to river systems and flood plains, but of a much larger scale than other county river systems;
- Cascade foothills, providing significant wildlife habitat and vegetation, sensitive water features, remote/low intensity recreation; and,
- dispersed open space areas which are site specific and combine resource, economic and urban based areas.

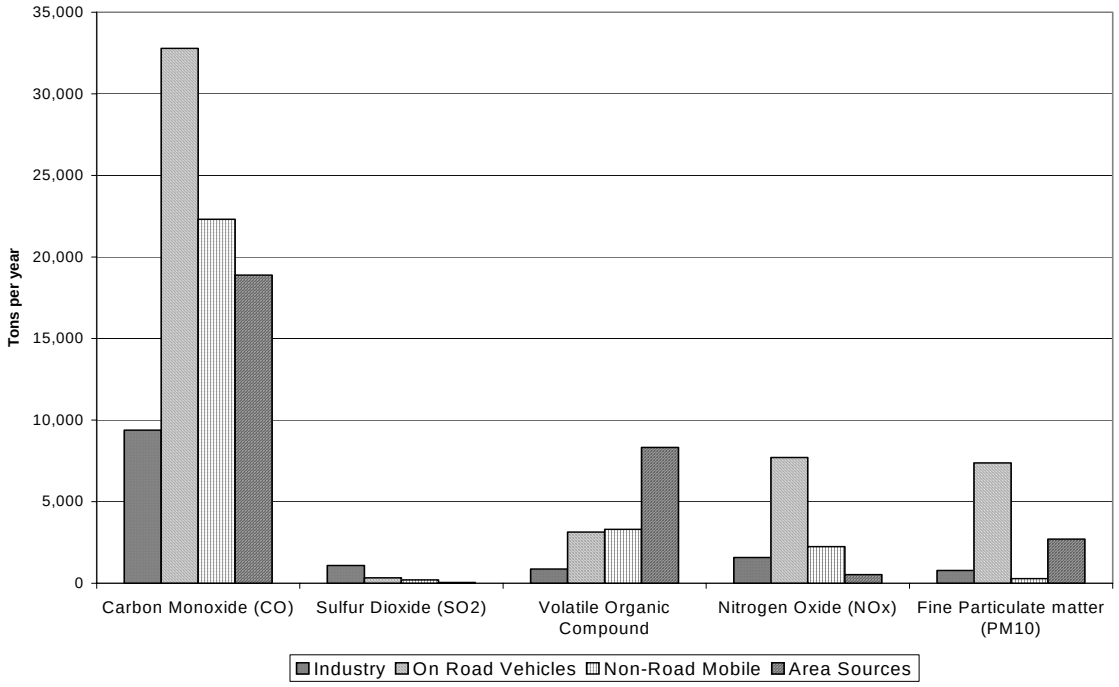
Conservation and greenway systems may be managed for a variety of uses, depending on the attributes of the site. Potential uses include wildlife habitat, low impact access for wildlife viewing and environmental education, regional trails, and where appropriate, picnic areas, boat ramps, fishing areas and regional parks. The County Parks and Recreation Division coordinates development of management scenarios with the state and federal wildlife agencies. Planning for and developing a park and recreation system which serves the diverse recreational interests of the residents of Clark County and fosters an environmentally sensitive approach toward preservation and enhancement of the county's valuable natural resources such as fish and wildlife habitat, wetlands and water quality. (See Chapter 7 for more details.)

Air Resources

Clark County is located in an air shed that is bounded on the south by West Linn, Oregon, on the north by Woodland, Washington, on the west first by the west Portland hills and then further west by the Coast Range, and on the east by the Cascade Mountains. The area experiences mild-wet winters and warm-dry summers. This region is susceptible to concentrations of air pollution near human activity centers. The Vancouver/Portland metropolitan area is considered to be a single interstate air shed by the U.S. Environmental Protection Agency. In topographic terms, the area is located within a bowl fully surrounded by mountains. The region also experiences strong atmospheric summertime inversions that can result in stagnant air conditions and the risk of incurring high air pollution levels. Air pollutants come from a wide variety of sources. Pollutants are often placed into specific source categories:

- Point sources, which are traditionally stationary facilities like rock quarries, lumber mills, and other manufacturing plants and processes. These emit relatively large volumes of air pollutants from a single location. Clark County's industry contributes about nine percent of the county's total summertime ozone air pollutants (e.g., volatile organic compounds (VOCs) and nitrogen oxides (NOx)).
- Area sources, such as gasoline-powered lawnmowers, household paints, dry cleaning chemicals, commercial or industrial solvents, and wood stoves or fireplace emissions, come from relatively small, individual sources of pollution, which are usually spread over a broad geographic area. Area sources collectively contribute significant levels of emissions, about 32% of the county's total summertime VOCs and NOx.
- Mobile sources include trucks, cars, and other vehicles. In Clark County, transportation generated pollutants in 2000 produced 59% of the ground level VOCs and NOx, and ~~are~~ were also responsible for 67 percent of the carbon monoxide problem. In addition, mobile sources emit significant quantities of fine particulate matter and other toxic compounds. Motor vehicles are Clark County's largest producer of air pollution as shown in Table 13.1.

Table 4.1. SWCAA 2000 Clark County Criteria Pollutants



Air Quality Conservation Programs

Clark County in the past has exceeded federally defined threshold pollution levels more frequently than allowed by federal air quality standards (e.g., more than once per year). On March 15, 1991, the Governor of Washington designated the urban area of the Vancouver portion of the Portland-Vancouver Interstate Air Quality Maintenance Area as a non-attainment area for ozone (O_3) and carbon monoxide (CO).

The Southwest Clean Air Agency (SWCAA) developed an air quality maintenance plan to address CO and ozone problems and submitted it to the state in 1995. The maintenance plan, with the identification and implementation of transportation control measures based on the land use assumptions of the 20-Year Plans, had to demonstrate that there would be no violations of national ambient air quality standards. Within the non-attainment area, state and federal regulations require limitations on outdoor burning of brush and using wood stoves or fireplaces for heating. All new woodstoves purchased in Clark County are required to be certified as meeting stringent statewide emission standards. Also, nearly all vehicles are subject to regular emission inspection and maintenance tests. These mitigation measures have helped to keep air pollution levels below federal thresholds in recent years.

Summertime ozone air quality was good during the summers of 1999, 2000 and 2001 primarily because cooler than normal temperatures were being recorded. The last summer in which hot temperatures were recorded was 1998. During the summer of 1998, the Vancouver/Portland region experienced three exceedances of the air quality health standard for ground level ozone. This 1998 circumstance nearly caused the region to fall into a dirty air status. Clark County's continued population growth from 1998 through 2001 suggests a negligible buffer for maintaining clean, healthy air within the metropolitan area once the region experiences hot summers. Scenic panoramas of Mount St. Helens and Mount Hood also degrade when high ground level ozone readings are measured. For the

other pollutants being monitored in Clark County such as carbon monoxide and fine particulate matter ($PM_{2.5}$), the county appears to have a reasonably adequate buffer for maintaining clean, healthy air with these air pollutants.

Transportation sources continue to be the major source of Clark County's air quality problem. The next closest category involves the air pollution activities of individual citizens carrying out their daily activities. Air pollution from individual citizens are collectively lumped into a category called "area sources" because they are individually small sources of air pollution. However, because there are so many citizens the emissions are collectively significant. Examples of these sources of air pollution include gasoline lawnmowers and household paint usage. Industry's air pollution emissions follow behind the transportation and area source categories. Under existing air quality regulations, new industry locating in the county is required to use the best available control technology to reduce its own emissions.

Land use planning decisions need to incorporate air quality impacts as one of the decision making tools when making land use designations. Computer software exists to perform this activity (e.g., quantify and incorporate air quality impacts into land use planning decisions). Ensuring clean, healthy air for Clark County and preserving our scenic panoramas on hot summer days means it needs to be possible for citizens to perform their daily activities without ever turning on their gasoline powered motor vehicle. Once the citizen has made the decision to turn on their motor vehicle, a high percentage of the vehicle's air pollution emissions are emitted in those first few minutes of vehicle usage. Designing land use so that it is possible for residents to not have to turn on their motor vehicle needs to be a goal. A combination of walking, using a bicycle or riding a bus needs to be a convenient possibility for performing short shopping trips and getting from home to work. Similarly, integrating bus stops and schedules with the needs of major employers in the Downtown, east Clark County and eventually north Clark County areas is a key to minimizing air pollution emissions from the transportation sector. Ultimately, planning for a transportation system where bus stops also connect to light rail for transportation throughout the region is the single most important means to improve air quality in the county.

GOALS AND POLICIES

A variety of programs and policies exist for the protection and conservation of environmentally critical areas. Due to the geographical overlap of many of the types of critical areas, there is a functional overlap of many of the policies. A program to address one type of critical area, such as a building limitation within a floodplain, may often offer some additional protection for other critical areas, such as wildlife habitat or wetland functions.

The following goals and policies reflect the county's interest in protecting the environmental quality of life in the county. Many, if not most, of the goals and policies stem from and are intended to complement federal and state mandates. The critical areas ordinances found in Title 40 of the Clark County Code derive from the goals and policies listed below.

Washington State Goals and Mandates

As noted earlier, the GMA requires the identification and protection of critical areas (RCW 36.70A.170 and 172). Critical areas can be found within the urban areas and within the rural and resource areas of the county. These critical areas include: flood hazard areas, geological hazard areas, wetlands, shoreline and surface waters, habitat conservation areas, aquifer recharge areas and scenic areas. Mapped critical areas can be found in Figures 1-8. In addition, the GMA requires that jurisdictions give special attention to the preservation and enhancement of anadromous fisheries. Policies outlined below are designed to meet the requirements of the GMA.

4.1 County-wide Planning Policies

4.1.1 Urban growth areas shall be established consistent with the protection of the environment and the enhancement of the county's high quality of life, including air and water quality, and the availability of water. The establishment of urban growth areas shall also be done in a manner consistent with the preservation of land, sites and structures that have historical or archeological significance.

4.1.2 The county and each municipality shall cooperate to ensure the preservation and protection of natural resources, critical areas, open space, and recreational lands within and near the urban area through adequate and compatible policies and regulations. These policies and regulations shall provide for the long-term viability of terrestrial habitat functions and natural watershed processes identified by scientifically-based assessment.

20-year Planning Policies

GOAL: Protect and conserve environmentally critical areas.

4.2 Policies

4.2.1 Clearly define and update maps of environmentally critical areas throughout the county and its cities, using federal, state or other accepted definitions where appropriate. Identify watershed processes on the maps and describe the reach-by-reach relationships among them. In particular, update Priority Habitat Species data as it becomes available from the Department of Wildlife or other sources.

4.2.2 Incorporate ways to respond to watershed processes and Priority Habitat Species data in local planning processes, such as SEPA review and the Habitat Conservation Ordinance.

4.2.3 Update regulatory and incentive programs for the protection and conservation of environmentally critical areas, including wildlife habitat areas, wetlands and shorelines, and the underlying watershed processes. Emphasis should be given to policies and standards to protect and conserve critical areas as larger blocks, corridors or interconnected areas rather than in isolated parcels.

4.2.4 Encourage consistency among Clark County and its cities regarding methods of critical area definition, mapping, mitigation strategies, and policy treatment.

4.2.5 Coordinate with other jurisdictions and agencies to protect environmentally critical lands, particularly ecosystems and watershed processes that span jurisdictional boundaries.

4.2.6 Facilitate public education and outreach programs explaining the variety of critical area and habitat resources that exist in Clark County and the benefits and opportunities for conservation, protection, and hazard mitigation.

4.2.7 Encourage the use of northwest native plants in landscaping, particularly adjacent to critical areas, and discourage the use of invasive non-natives (e.g., English ivy).

4.2.8 Protect groundwater and surface water as a resource for drinking water, commerce, recreation and for wildlife based on the following:

- minimize the amount of impervious area created by developments;
- promote the use of non-toxic pesticides and fertilizers;
- minimize potential application of sludge or animal waste material in or near sensitive areas such as aquifer recharge areas or surface water bodies as required by state law;
- provide stormwater management service as specified in the Capital Facilities and Utilities Element (Chapter 6) of the 20-Year Plan; and
- provide stream bank erosion control using biological engineering methods.

4.2.9 Reduce risk to life and property from hazards associated with development in geologically hazardous and floodplain areas by:

- prohibiting, discouraging, or mitigating development in areas of steep slopes or other areas with high potential for geological hazards;
- limiting the removal of vegetation during development in order to reduce storm runoff and erosion;
- requiring geotechnical studies to determine construction methods and technologies necessary to further public safety in geologically hazardous areas including landslide areas and steep slopes. Development design and construction technology used shall be appropriate to the soil limitations of the particular site; and,
- continuing to prohibit development in the floodway. In the flood fringe, development impacts shall be mitigated through the use of appropriate construction designs, methods and timing. Floodplain functions will be protected to the extent possible.

4.2.10 Encourage habitat protection that will provide a diverse and sustainable population of fish and wildlife.

4.2.11 Solicit review assistance from the Washington Department of Fish and Wildlife (WDFW) for development proposals directly affecting state or federal sensitive, threatened, or endangered species.

4.2.12 Limit clearing of vegetation from stream banks, and restores the integrity of stream banks where degraded by development.

GOAL: Protect and recover endangered species within Clark County.

4.3 Policies

4.3.1 The county will update and implement the Habitat Conservation Ordinance (HCO) with regard to the preservation of state and federally listed fish and wildlife species and their habitats.

4.3.2 Consult with the WDFW when future land uses have a probable impact on listed species and their habitat.

4.3.3 In cooperation with WDFW, establish appropriate avoidance, minimization, and mitigation measures that functionally replace or improve affected species habitat.

GOAL: Protect, conserve, and recover salmonids within Clark County.

4.4 Policies

4.4.1 Salmonids cannot distinguish between urban and rural boundaries. Resource protections in both areas should be applied using scientifically based recovery strategies.

4.4.2 The county shall consider salmonids and their needs as defined by Best Available Science when siting and modifying county or municipal capital facilities.

4.4.3 Restore and maintain properly functioning ecosystem conditions for salmonids in all county waters. Embrace and implement recovery plans adopted by the National Marine Fisheries Service (NMFS) and the Lower Columbia Fish Recovery Board.

4.4.4 Consolidate regulations and the permitting process to achieve the salmon-friendly vision for the county, incorporating adaptive management principles.

4.4.5 Provide incentives for salmon-friendly development and land use activities, including the installation of culverts in rural sub-basins.

4.4.6 Restore streams and fish passageways in urban sub-basins and other appropriate watershed basins.

GOAL: Require sewer service within urban growth areas and discourage septic use.

4.5 Policies

4.5.1 Require regular inspections of existing on-site sewage disposal systems in wellhead protection areas.

4.5.2 Establish mandatory subsurface sewage disposal septic inspection/ maintenance programs for existing septic systems, particularly areas needing environmental health guarantees.

4.5.3 Wastewater treatment, in rural areas, shall be provided by individual on-site treatment systems or approved alternative sewage treatment technologies. Sewer lines shall not be extended except to correct existing health hazards and provided that other means for treatment, such as state approved alternative technologies, have been assessed and determined not to be feasible due to environmental constraints.

GOAL: Provide a long-range stormwater management program to minimize impacts from stormwater discharge from existing and new development.

4.6 Policies

4.6.1 Implement stormwater basin planning to effectively address stormwater management in developed and urbanizing areas.

4.6.2 Adopt stormwater standards substantially equivalent to those in the Washington DOE Stormwater Management Manual, and continue to monitor and update the stormwater control ordinance and related policies and standards to implement and enhance stormwater management.

4.6.3 Maintain clear development review standards for the control of the quantity and quality of storm water discharge from development projects which emphasize on-site retention, treatment and infiltration of run-off to streams, rivers, wetlands, and lakes.

4.6.4 Limit the removal of vegetation during development in order to reduce storm water run off and erosion.

4.6.5 Establish a coordinated approach with local jurisdictions to solve both surface water and groundwater issues.

GOAL: Protect and enhance the shorelines of Clark County.

4.7 Policies

4.7.1 Clark County's Shoreline Master Program shall be reevaluated for consistency with the Growth Management legislation and the county's 20-Year Plan. Any areas of inconsistency shall be reviewed and resolved with either modification

of the Shoreline Master Program or Comprehensive Plan policies, which ever is more appropriate.

GOAL: Manage the parks and open space of Clark County consistent with protecting water quality and critical areas, and with enhancing the recovery of listed species.

4.8 Policies

4.8.1 County Parks will be managed to meet the compliance and recovery objectives as identified through the ESA process and the regional recovery plan.

GOAL: It is important for Clark County citizens' health and the community's economic development prospects to have the region achieve and maintain clean healthy air.

4.9 Policies

4.9.1 Clark County's air resource is to be managed to preserve and enhance air quality.

4.9.2 Land use planning needs to incorporate air quality impacts as an additional land use planning decision criteria.

GOAL: Minimize property damage from geological hazards and flooding.

4.10 Policies

4.10.1 Develop and implement a comprehensive Hazard Mitigation Plan as required by FEMA in order to meet the federal and state Disaster Recovery Act 2000.

4.10.2 Establish and coordinate a sustainable approach to natural hazard mitigation with all local jurisdictions on identified critical areas, open space and recreational lands to lessen or eliminate hazards before an emergency happens.

4.10.3 Provide incentives for hazard reduction development and land use techniques. Develop methods for leveraging state and federal competitive mitigation funds with local development fees.

GOAL: Clark County will conduct its operations in a manner that meets all NPDES and ESA requirements.

4.11 Policies

4.11.1 County operations shall be conducted to meet the requirements outlined in the National Pollutant Discharge Elimination System permit.

4.11.2 Clark County will adopt and comply with the Regional BMP manual.

GOAL: Clark County shall carry out its activities in a manner that can serve as an example of environmentally sustainable practices.

4.12 Policies

4.12.1 County resources and purchasing power will be used to the extent practicable to support environmentally sustainable business practices.

4.12.2 County activities shall be periodically reviewed and updated to reflect best management practices.

STRATEGIES

The following strategies are proposed as a means to achieve the goals and policies of the Environmental Element. These are a range of strategies that the county is considering and some of these should be implemented over time.

- Incentives should be developed that encourage open space, recreation, and protection of the natural environment.
- Evaluate a variety of funding sources and their feasibility for acquisition of land and other programs to implement the policies within the Environmental, Rural and Natural Resource Elements and to comply with regional salmon recovery goals and objectives.
- Develop and implement comprehensive stormwater management plans, including funding provisions, for all watersheds in the county that comply with recovery objectives.
- Develop a watershed protection implementation program that is salmon-friendly with the goals of resolving and preventing deterioration of all local water resources within identified watersheds. Develop watershed plans that recognize watershed processes and that address impacts to wildlife habitat. The program shall:
    - protect groundwater;
    - safeguard drinking water quality;
    - protect surface water quality;
    - insure groundwater recharge;
    - control urban flooding;
    - enhance wetland habitat; and
    - establish local funding mechanisms for water quality and water resource protection.
- Develop a protocol to identify natural watershed-wide processes, their inter-relationships reach by reach, and how they might be degraded by human activities. The protocol will be designed to associate the watershed processes with the various environmental mandates imposed by the state and federal governments on Clark County and the jurisdictions within it. The use of a standardized assessment protocol should streamline permitting, promote efficient monitoring and focus restoration and mitigation projects.
- Clearly articulate a long-term salmon-friendly vision for the future of the county. Update the Habitat Conservation Ordinance and other ordinances to meet salmon recovery goals. Update other regulations to encourage innovative solutions to achieve a salmon-friendly vision.
- Investigate the use of a Public Benefit Rating System of property taxation to encourage development, recording and implementation of Stewardship Plans on parcels essential to salmon recovery or other watershed processes.
- Develop measures county-wide to ensure erosion and sediment control for new development, re-development, and excavation projects.
- Adopt the use of land use planning software that analyzes air quality impacts of proposed land use actions.