

INTRODUCTION

One of the tasks in Creswell's Comprehensive Plan Update is an inventory and analysis of natural resources. The City of Creswell Natural Environment Inventory and Report (Report) provides a basic summary and inventory of these resources, including a broad-level review that will support natural resources-based policies and recommendations to be included in the Comprehensive Plan Update.

Central to this report is consideration of natural resources that are critical to the health, safety, and welfare of Creswell's current and future residents. Critical natural resources are those that are essential or indispensable. These resources provide clean air, water, and food that residents need, while protecting them from floods, landslides, and other natural hazards. These resources are also important economically as they may produce tax revenues, ensure an attractive community setting, and protect development from the costs associated with natural hazards. These critical resources also play a vital role in defining the character of the Creswell community and providing the quality of life its residents value.

Because human populations require healthy and dynamic natural processes and habitats to support them, protection of these processes and habitats are in the public interest and become a function of government. Much of the responsibility for Natural resources planning within the Oregon Land Use Program is given to local governments. Natural resources planning can greatly reduce uncertainty about future development and allow cities to develop more accurate buildable lands inventories and direct urban development.¹

Natural resource protection is a component of several statewide planning goals. This report addresses the resources outlined by Oregon Statewide Planning Goals 6 (Air, Water, and Land Resources Quality) and elements of Goal 5 (Natural Resources, Scenic and Historic Areas, and Open Spaces). The approach of this report will not be as technical and rigorous as Statewide Planning Goal 5 analyses require but will provide a basic inventory of air, water and land resources in Creswell and its surrounding area with special consideration for the future of those resources.

This final product includes a description of the resources that were inventoried, maps displaying the natural resources in the area that support goals related to Creswell's natural environment, policy recommendations specific to Goal 6, and general recommendations specific to the natural resource aspects of Goal 5.

Community Profile - Geography

Creswell is located in central western Oregon, where the foothills of the Coastal and Cascade Mountain ranges blend into one another at the southernmost end of the Willamette Valley. Creswell's city center is located approximately one mile west of the Coast Fork of the Willamette River in the northern portion of the drainage associated with the Willamette River. Creswell is 10 miles south of Eugene-Springfield and a little over seven miles north of Cottage Grove along Interstate-5 (I-5).

The City is approximately 541 feet above sea level and is situated in a relatively flat river valley surrounded by forested hills on both the east and west. The most prominent topographic feature in Creswell is Creswell Butte, which rises above the southern part of town to about 900 feet

¹ Planning for Natural Resources, Oregon Chapter APA, August 2004

above sea level. West of town, the foothills of the Coastal Range rise to over 1,000 feet in elevation, and the foothills of the Cascades to the east rise to over 2,000 feet.²

There are a number of rivers and streams that flow through Creswell and its surroundings. Significant among these are Hill Creek, which flows along the southeastern portion of town and into the Coast Fork of the Willamette, and Camas Swale Creek, which runs along the western edges of town. An additional unnamed creek east of town also provides significant local drainage. Because of the relatively flat nature of the floodplain, Hill Creek is associated with localized ponding and therefore a number of wetlands.

Community Profile - Population and Employment

Population in Creswell grew from 1,199 in 1970 to 4,500 in 2006. Creswell's growth rate has outpaced both Lane County and State of Oregon, and Creswell's share of population in Lane County grew from 0.6 percent in 1970 to 1.3% in 2006. In 2005, Creswell's UGB contained 1,326 acres with 975 of this acreage inside the city limits. Nearly 47 percent of all land inside the UGB is designated for residential use. Thirteen percent is designated for commercial uses, 10 percent is designated for resort commercial uses, and 11 percent is designated for industrial uses.³ Creswell's largest employment industries are in four sectors: Government, Manufacturing, Retail Trade, and Accommodation and Food Service.

Creswell's significant population increase is projected to continue in the upcoming years. Population forecasts show that Creswell is expected to grow faster than any city in Lane County except Coburg over the 2004-2025 period.⁴ Lane County coordinated population projections for the City of Creswell, adopted in February 2005, forecast that 7,300 people will live within Creswell's city limits in 2025. The Buildable Lands Inventory and Transportation System Plan Update are using a projection of 7,572 people in the year 2027.

Creswell's proximity to larger urban areas, I-5, and its small-town character are advantages for economic growth in Creswell. An analysis of national, regional and local economic conditions and trends, and Creswell's comparative advantages imply the following for overall economic development in Creswell⁵:

- The Creswell Airport may help Creswell attract businesses engaged in the manufacture and service of aircraft, avionics, and related equipment.
- Creswell's semi-rural setting, access to I-5, and workforce availability make Creswell attractive for businesses in manufacturing, such as the manufacture of RVs and related equipment, high-tech electronics, food processing, industrial equipment, recreational equipment, and other specialty manufacturing, and businesses in warehousing and transportation.
- Creswell's attractive semi-rural area could make it a location for software design, engineering, research, and other professional services that are attracted to high-quality-of-life settings.

² Creswell Comprehensive Land Use Plan, September 1982

³ Creswell Economic Opportunities Analysis, March 2005

⁴ Coburg will be installing its first sewer system, which is projected to relieve pent-up demand for development and will lead to a substantial population increase

⁵ Creswell Economic Opportunities Analysis, March 2005

Employment is currently dominated by Commercial uses (53 percent), followed by Industrial (33 percent) and Public (14 percent). It is anticipated that Creswell will receive an increasing share of employment growth in Lane County as it becomes a more fully developed community, and growth from spillover caused by increasingly and crowded conditions in Eugene and Springfield. Almost 900 jobs are expected to be added to the Creswell UGB between 2003 and 2025 in Commercial, Industrial and Public land use types:

Community Profile - Growth Patterns and Housing

Current zoning and comprehensive plan designations indicate that 51 percent of land in the Creswell UGB will be used for residential purposes, 25 percent for commercial uses, 14 percent for industrial uses, and the remaining 10 percent for parks or public facilities. A recently completed *Preliminary Evaluation of Potential Urban Growth Boundary Expansion Areas* indicates that the City of Creswell will face some challenging decisions regarding where it expands its UGB.

State statute⁶ requires the City to look at exception land first. The areas that may best meet Creswell's need for land to support employment uses may be located on Highway 99 north of the current UGB. This area may be desirable because of the access provided by Highway 99 and the visibility of these areas from I-5, particularly land east of Highway 99. If the "North" study area (identified as lands north and west of the existing UGB, west of I-5 and Highway 99, contiguous with the existing UGB on the north and west side) is included in a UGB expansion, areas designated for employment use might be extended to the western portion of this study area to create a commercial/industrial district. A transition from existing and new commercial and industrial uses to existing and new residential uses should be provided.

In addition, the Economic Opportunities Analysis (EOA) identified land near the Creswell Airport as providing an opportunity for airport-related uses, which are expected to be a growth industry in Oregon. Inclusion of land near the airport for employment uses may justify inclusion of the exceptions areas at the north end of the Airport East study area for efficiency and serviceability. Interest has been expressed in developing higher end homes with access to the airport for planes owned by these homeowners.

The EOA identified Creswell's small-town character and lifestyle as primary comparative advantages for economic development. In this context, EOA-study areas west of I-5 may be appropriate for residential development as they would extend Creswell's traditional residential areas and allow access to schools without crossing I-5.⁷

Creswell's housing stock today consists primarily of single-family homes. Approximately two-thirds of the housing within the UGB is single-family detached, 15 percent is manufactured dwellings in parks, and 11 percent is multi-family. The median value of owner-occupied units was lower



New homes along the northern edge of Creswell city limits

⁶ ORS 197.298

⁷ Preliminary Evaluation of Potential Urban Growth Boundary Expansion Areas, ECONorthwest, July 2005

than that of Lane County, although these values may reflect the higher percentage of manufactured dwellings in parks, which do not include the value of the land as part of the value of the unit. Development in Creswell since 2000 has included more expensive dwellings in the vicinity of the Emerald Valley resort, east of Interstate 5. The City of Creswell has a higher percentage of owners than renters than Lane County , while having a lower median contract rent .⁸

⁸ U.S. Bureau of Census, 2000 data

PLAN MISSION AND GOALS

Goal Summary and Overview

The purpose of this report is to develop a comprehensive inventory and understanding of the natural resources in Creswell and the surrounding area and recommend measures by which the City can protect these resources as it grows. Visions for the future of Creswell, presented in current and previous city planning documents confirm the important role that the vitality of Creswell's natural resources play in the City's future.

Creswell's current Comprehensive Plan, acknowledged by the Department of Land Conservation and Development in 1982, presents the following goal for growth:

"Creswell's growth and related urbanization objective is to maintain its small community atmosphere and living environment through guided growth"⁹

In 2000, Region 2050 developed a vision for the next fifty years:

"Preserve and strengthen the community's livability and its attractiveness as a small town, while the city takes its place as a major employment center in the regional economy. The City's strategy is to capitalize on its key access to roadways, rail, and local air facilities, while preserving and promoting the city's small town atmosphere and surrounding natural beauty."¹⁰

In 2004, the Creswell Economic Development Plan included the following vision:

"The City of Creswell, with its economically viable downtown; small, clean industries; cohesiveness; and beautiful setting, will continue to serve the commerce, educational and recreational needs of the community and the rural area surrounding Creswell. The City values and will continue to build upon its close-in rural location for economic, cultural and recreational purposes."¹¹

The provision of a healthy natural environment is key to Creswell's goals and visions for the future of the City. Understanding that there are many questions surrounding the legal constraints involved in natural resource planning, the City desires to perform preliminary work that would lay a foundation for more extensive natural resource analysis and policy-making in the future.

Assessment Approach and Methodology

This Report uses existing research and broad level data, such as hydric soil layers, National Wetlands Inventories, and regional water feature data to compile the inventory. Three resource maps present data graphically.

The central consideration of this first phase natural resource inventory is Creswell's future land use activities and how the inventory and analysis will promote and be evidence of compliance in the future. For this reason, staff defined an assessment approach and methodology for

⁹ Creswell Comprehensive Plan, page 76

¹⁰ A Profile of the Creswell Community, Region 2050, page 8

¹¹ City of Creswell and Creswell Region Economic Development Plan, page 31

determining protection priorities. Each resource has a clear methodology outlined. Where provided, federal, state, and local regulations and methodologies are used in the inventory and analysis. This includes resources and information to assist the City government, residents, public and private sector organizations, and others interested in participating in planning for future growth.

Procedural Outline

Preliminary research was conducted by staff to determine a logical approach to the Creswell Natural Environment Inventory and Report. Staff relied heavily on previous Creswell planning documents, related research, and the Oregon Department of Land and Conservation Development. Staff also referenced Natural Resource related plans from other jurisdictions in the state and region. Following this background research, a draft of the Natural Environment Inventory and Report was written and submitted to the members of the Citizen Involvement Committee for review. A public meeting was held for comment on the plan and action items before the plan was finalized and submitted to the Creswell City Council.

Plan Development Participation and Adoption

This Report is a collaborative effort between the City of Creswell and local stakeholders. The Creswell Citizen Involvement Committee was formed to provide guidance and direction on Creswell's comprehensive planning process. The Creswell City Council has the authority to develop and adopt public policy, including natural resources.

Implementation through Existing Programs

The City of Creswell addresses statewide planning goals and legislative requirements through its Comprehensive Plan. This Report provides recommendations that are tied to the goals of the existing plans and programs. The City of Creswell will be able to implement action items through existing programs and procedures, as well as apply for additional assistance for projects requiring funding currently outside existing programs. These programs, plans and policies include among others, the Creswell Parks and Open Space Master Plan, the Creswell TMDL Implementation Plan, and the Creswell Development Code.

Outcomes

This Report describes the maintenance and improvement of the health of Creswell's natural environment, and future compliance with state and federal laws regarding Natural Resources.

The City of Creswell will continue to involve the community in the natural resources planning process. The public will have the opportunity to submit comments on this report to the Planning Department at any time. Copies of the report will be kept at City Hall, the Creswell Public Library, and online at www.ci.creswell.or.us.

AIR AND NOISE

This section will present and discuss the existing conditions of and future considerations for air quality and noise in the City of Creswell.

Air Pollution

Air pollution has a number of sources. In some cases sources of pollution can be traced to a specific location or point (e.g. factories or mills). Specific point sources are, however, not the only contributors to air pollution. Pollution also results from a number of sources that do not have specific locations, including automobile emissions, road dust, ash particulate from wood stoves, and field burning.

It is a fundamental goal of the City of Creswell to take measures to protect the community from the health effects of air pollution. Sensitive populations such as children and the elderly have a special vulnerability to the health impacts of air pollution. Other vulnerable populations include pregnant women and those with serious health problems affected by air pollution (asthma, heart and respiratory disease).¹²

Understanding the sources of air and noise pollution within a community, as well as the key locations of sensitive populations, can provide critical insight for mitigating the negative impacts of current and future growth.

Existing Conditions

Creswell's primary sources of air pollution are unpaved streets, automobile exhaust, backyard burning, and woodstoves.

Residential open burning of woody yard trimmings, leaves, and grass clippings is permitted.

Specific contributors to transportation-related air pollution in Creswell include I-5 and Highway 99, which run north and south through Creswell. Additionally, the Lane Transit District also provides bus service into Creswell. Point sources of air pollution within the City's UGB include veneer dryers, sawmill operations, grass seed

processing, and fiber production plants that produce suspended solids, smoke, and odors. Until its recent closure, the Foster Farms processing facility north of Creswell was the greatest contributor of point source pollutants in Creswell.¹³

In Lane County, four criteria pollutants are measured: particulate matter, carbon monoxide, ozone, and lead. The Eugene/Springfield area is monitored for all four pollutants. The Lane Regional Air Protection Agency (LRAPA) measures pollutants at five locations in Eugene, one



A mill located on the west side of Creswell

¹² Air Quality and Land Use Handbook, California EPA, July 2005

¹³ Creswell Implementation Plan, ECONorthwest, June 2005

location in Springfield, one location in Saginaw (south of Creswell), and one location in Cottage Grove (south of Saginaw).

The last air quality measurement for the Creswell area specifically was recorded at Creswell High School for the full calendar year of 1977. At that time Creswell's air was found to be well below the maximum annual particulate standard. Since that time Creswell's air quality has not been of sufficient concern to warrant local testing by LRAPA.

Considerations for the Future

In the future, land use decisions should continue to give special consideration in to the proximity of industrial uses around sensitive populations in Creswell. These would include schools, child and senior care centers, as well as hospitals and clinics. Care should also be taken to avoid siting sensitive land uses near Highway 99 or I-5. The Air Features map shows the location of the following sensitive uses, along with a number of transportation and industrial uses.

Sensitive Land Use Locations

- S-1** Awesome Care Incorporated
- S-2** Creswell High School
- S-3** Over in Meadow Child Care Center
- S-4** Creslane Elementary School
- S-5** Growing Place Pre-Sch./Child Care
- S-6** Creswell Middle School
- S-7** Creswell Clinic (PeaceHealth)
- S-8** Cresview Villa
- S-9** Creswell Care Center Nursing Home
- S-10** Creswell Christian Childcare Center

Transportation and Industrial Locations

- P-1** Foster Farms (closed as of summer 2007)
- P-2** Highway 99/Railroad
- P-3** Creswell Airport
- P-4** Interstate 5
- P-5** Bald Knob Lumber Mill
- P-6** LTD Bus Stop
- P-7** Emerald Forest Products (Veneer Mill)

The 1982 Comprehensive Plan provides the following direction regarding Creswell's future air quality concerns.

Due to the proximity [of Creswell] to the Eugene-Springfield Air Quality Maintenance area, any major sources of particulate pollution locating in or near Creswell should receive careful scrutiny for potential impact on the Eugene-Springfield airshed.¹⁴

The Eugene/Springfield area has been designated PM10 "non-attainment" area, there is however, no indication that the level of air pollutants in Lane County will pose a constraint on economic development in Creswell over the planning period. ¹⁵

Noise Pollution

Existing Conditions

Transportation activities and industry are the primary sources of noise in the Creswell area, including aircraft operation from the Creswell Airport, rail traffic on the railroad, vehicular traffic along Highway 99 and I-5, and local mills in the City's industrial areas.

The Creswell Development Code contains an Airport Overlay Zone (see Air Features Map). This overlay includes provisions to ensure that land uses consistent with airport noise levels are

¹⁴ Creswell Comprehensive Plan, 1982, page 17

¹⁵ City of Creswell and Creswell Region Economic Development Plan, August 2004

established. For example, a declaration of all of the anticipated noise levels must be attached for all subdivision and partition approvals. In addition, issuance of building permits in the zone is partially contingent upon the inclusion of building design measures that ensure an indoor noise level of 55 Ldn (Day-Night Average Sound Level).¹⁶

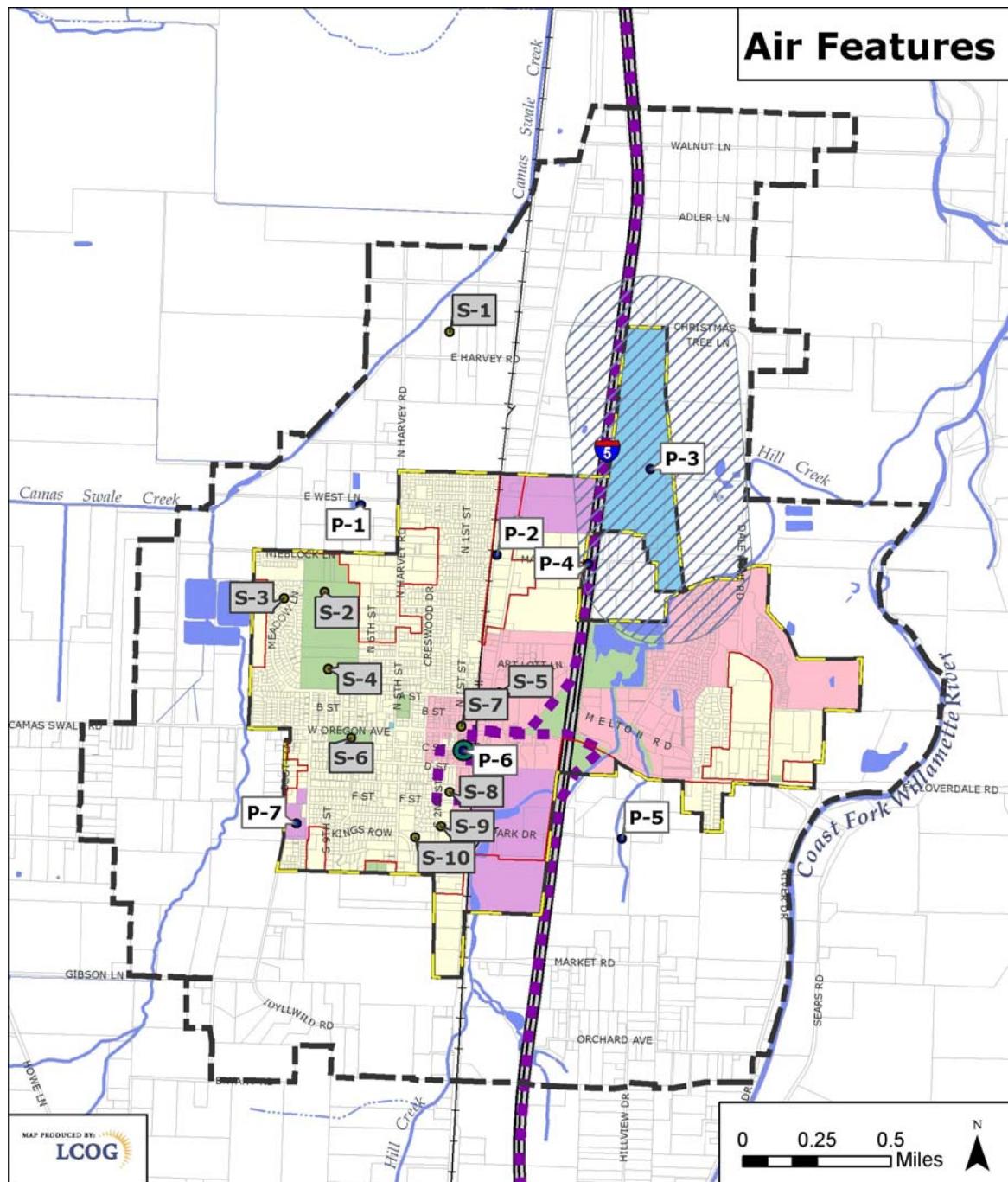
Considerations for the Future

Limitations exist to what can be done to eliminate current noise situations, especially those caused by transportation. Key to the prevention of future noise problems depends upon separating noise-generating areas from noise-sensitive areas, limiting noise emissions, and emphasizing noise insulation techniques in new construction. The Department of Environmental Quality encourages local governments to consider noise factors in their planning and zoning decisions. In the future, Creswell should review proposed development to determine if land use plans would result in a violation of statewide standards. Review would include the siting of noise-generating facilities, and noise-sensitive development (such as residential development), transportation corridors and facilities, and public facilities such as the sewage treatment plant. Technical and monetary assistance may be available from the U.S. Environmental Protection Agency to develop and implement sound quality maintenance programs utilizing sound measurement.

The Air Features map that follows shows the location of the following sensitive uses, along with a number of transportation and industrial uses (Note: this table is also presented on the previous page).

Sensitive Land Use Locations	Transportation and Industrial Locations
S-1 Awesome Care Incorporated	P-1 Foster Farms (closed as of summer 2007)
S-2 Creswell High School	P-2 Highway 99/Railroad
S-3 Over in Meadow Child Care Center	P-3 Creswell Airport
S-4 Creslane Elementary School	P-4 Interstate 5
S-5 Growing Place Pre-Sch./Child Care	P-5 Bald Knob Lumber Mill
S-6 Creswell Middle School	P-6 LTD Bus Stop
S-7 Creswell Clinic (PeaceHealth)	P-7 Emerald Forest Products (Veneer Mill)
S-8 Cresview Villa	
S-9 Creswell Care Center Nursing Home	
S-10 Creswell Christian Childcare Center	

¹⁶ City of Creswell Development Code, page 2-91



Legend

Study Area	Air Quality Features	Comprehensive Plan Designations
Urban Growth Boundary	Sensitive Assets	Residential
City Limits	LTD Bus Stops	Commercial
Tax Lots	2005 Ltd routes	Industrial
	Airport_Noise	Park, Recreation, Open Space
		Public Facilities / Government

WATER

This section discusses the existing conditions and future recommendations regarding water features in Creswell. The most fundamental feature of hydrologic systems is a watershed, which is defined as the land area that catches rain or snow (precipitation) and drains to a common point. A system of drainage pathways, either underground or on the surface, move the water. Often these pathways come together into a river which gets larger as it progresses downstream.

While Creswell contains a number of streams, canals, and rivers, and therefore a number of drainages, all of the streams and canals within the Creswell study area are within the Coast Fork sub-basin of the Willamette River Watershed.

Creswell's water features capture, store, and release water, filter sediments and pollutants, cycle nutrients through the environment, and support many living organisms, including humans. These functions are dependent upon the climate, topography, soil, and vegetation within the watershed. When a function in any part of a watershed is disturbed, the effects are felt throughout the watershed.¹⁷



The Coast Fork of the Willamette east of Creswell

The Water Features Map shows water features within the Creswell Study Area as documented by the National Wetlands Inventory. Currently Creswell does not have a Local Wetlands Inventory (LWI). Each feature and its mapped representation will be discussed in greater detail in the following section.

Groundwater Resources

Groundwater is the water below the earth's surface. More specifically, it is the water from precipitation that is found underground in the spaces and cracks in soil, rock, and sands. Concerns about groundwater include two elements: the additions to and withdrawals from the system. Management of the quantity and quality of these elements is crucial to the health of a groundwater system.

Groundwater is vulnerable to contamination that occurs when pollutants seep into the groundwater. Sources of contamination include landfills, hazardous waste sites, leaking storage tanks containing gasoline, oil or other chemicals, road salts, insecticides and pesticides from lawns and farms, and septic systems. Restoring contaminated groundwater is not only time consuming, but costly as well. Millions of dollars can be spent removing contaminants from the water to make it drinkable. This cleanup can double or triple the cost of water. Preventing contamination is the most cost-effective practice.¹⁸

¹⁷ California Forest Stewardship Program, December 2004

¹⁸ The Groundwater Foundation, December 2004

Existing Conditions

The City of Creswell has two water sources: surface water from the Coast Fork of the Willamette River, and groundwater from two well fields located at Garden Lake Park and Emerald Valley. These wells draw off of two separate aquifers and are at depths from 54 to 197 feet deep. These aquifers, Willamette Alluvium and Fisher Formation, are part of the Willamette Basin Water Reserve.

Wells in Central Lane County that are associated with the Fischer Formation are known to produce arsenic rich water. Health problems have been associated with consumption of arsenic-rich water including cancer (at high concentrations) as well as skin damage and circulatory problems.

The City of Creswell recently reported levels of arsenic above the U.S. Environmental Protection Agency's (EPA) drinking water standards in the City's system. The EPA maximum standard for Arsenic was recently reduced from 0.050 mg/L to 0.010 mg/L. The average level of Arsenic in the Creswell system over the last year has been 0.013 mg/L.

Considerations for the Future

The City has plans to incorporate a new Membrane Treatment Plant by fall 2008. This new facility will be capable of removing arsenic from the City's system, a critical step in ensuring the future use of Creswell's groundwater resources.

The principle concerns for Creswell's groundwater as identified by the 1982 Comprehensive Plan include: (a) Over development of an area that relies on groundwater, which could result in loss of water supply and degradation of quality; and (b) protection of aquifer recharge areas from intensive land uses.¹⁹ These concerns, along with concerns regarding arsenic levels in the City's groundwater, remain.

The City must adopt land use policies and programs to protect significant groundwater resources, ensure that reliable groundwater is available to areas planned for development, and provide a reasonable level of certainty that the carrying capacity of groundwater resources will not be exceeded in the future.

Groundwater contamination can be controlled by ensuring septic systems outside the city service area are properly sited and constructed, regulating development in groundwater recharge areas, reducing the amount of paved surfaces, removing leaking tanks, and educating the public about the proper way to dispose of oil and other chemicals.

Water Bodies

The Creswell Development Code defines water bodies as permanently or temporary flooded lands that may lie below the deepwater boundary of wetlands. Water bodies include rivers, streams, creeks, sloughs, drainage ways, lakes, and ponds. Ponds, lakes, and streams are often popular for development as natural amenities. This same attractiveness to development also threatens the health of these areas. The Water Features Map identifies the specific features discussed in the following section (W-1, W-2,...).

¹⁹ Creswell Comprehensive Land Use Plan, September 1982

Lakes

Lakes are large bodies of normally fresh water, which may be formed by river drainage, surface water runoff, glaciers, ground water seepage, or human construction. Lakes provide important habitat for fish, wildlife, and migratory birds. They are also valuable areas for recreational activities such as water sports, fishing, and hunting.²⁰ The Creswell study area includes one named lake and a number of ponds.

Garden Lake (W-6). Garden Lake is part of an area known as the Creswell Ponds. The lake and its surroundings (34 acres) are part of the Creswell park system. These water features are the by-product of quarry pits created during the construction of I-5 in the late 1950s and early 1960s. Four ponds were created in line with the flow from Hill Creek.

The National Wetlands Inventory also includes a number of unnamed bodies of water. Most of these are associated with Hill Creek and the Coast Fork of the Willamette River. Significant among these is a ten-acre lake just east of the City's UGB that is associated with Lane County-owned Cinderella Park (**W-7**).

Existing Conditions

Garden Lake Park is a beautiful area offering walking trails, birding, fishing, and a boat launch. The park is primarily used for fishing, but is an excellent locale for canoeing and bird watching.

Garden Lake is surrounded by commercial and residential land to the south and east, and I-5 to the west. The north edge of the park forms the edge of the UGB. With help from city officials and conservation partners, the park is currently undergoing restoration activities to ensure its continued health as a habitat for many native plant and animal species.²¹



Garden Lake Park, looking eastward

Considerations for the Future

With development nearby, the Garden Lake system, along with other lakes and ponds in the area, will require additional attention and consideration. The Environmental Evaluation and Strategies section of the Region 2050 project suggests that whereas there were 3.6 miles of river, stream, or lake frontage within 500 feet of developed lands within Creswell's UGB in the year 2000, that number could potentially more than double to 8.8 miles in 2050, given the growth scenarios suggested in the Region 2050 project. It will be important to protect the Garden Lake area from the additional resource degradation that can arise from development (e.g. increased runoff, loss of riparian vegetation).

Streams

Streams are defined in the Creswell Development Code as an area where enough surface water flows to produce a stream channel, such as a river or creek that carries flowing surface water either intermittently or during most of the year. Streams form complex ecosystems that provide water, a variety of aesthetic values, and important wildlife habitat. The Creswell study

²⁰ Environmental Protection Agency, December 2004

²¹ Coast Fork Willamette Watershed website

area contains a number of rivers, creeks, and other waterways. These are described in the following sections.

Coast Fork of the Willamette River (W-1)

The Coast Fork is the most significant body of flowing water in the Creswell area. The Coast Fork Watershed forms the southern edge of the larger Willamette River Watershed. The Willamette River is an important tributary of the Columbia River, one of the largest in the U.S. The region around the Coast Fork drainage basin is ecologically and economically important.²² The area's mild climate and fertile soils have long been a place of human habitation.



Coast Fork of the Willamette River

The Coast Fork and associated greenway run towards Eugene east of Creswell. The river serves as the eastern border for much of the Creswell study area. Historically, dense riparian forests lined the Willamette River with Douglas fir, Oregon ash, black cottonwood, big leaf maple, alder, Western red cedar, and willow. These riparian forests grew abundantly on the river floodplain, which was composed of a network of braided channels and was subject to frequent flooding.

Streams in the Creswell area include:

Camas Swale Creek (W-3)

Camas Swale Creek is approximately 15 miles long and generally runs along the northwest edge of Creswell's UGB. There are two significant forks of what is considered to be Camas Swale Creek. One fork flows eastward from the Coast Range directly to the west. A second fork of the Creek flows northward into Creswell from the hills southwest of the City. The two forks of Camas Swale Creek come together just northwest of Creswell near West Lane. The entire area of this creek is located in the flood plain. Mature poplars and willows, as well as invasive non-native species, grow on the creek's banks.²³

Hill Creek (W-2)

Hill Creek is fed from natural sources at its origin in Lynx Hollow, south of Creswell. The Creek is also fed by flows from a "push up" dam on the Coast Fork Willamette River. Hill Creek meanders from Lynx Hollow and then runs closely adjacent to Highway 99 northward through the eastern portions of Creswell. The Creek is associated with a number of ponds in the Creswell area including Garden Lake. The Oregon Department of Fish & Wildlife observed cutthroat trout and other exotic fish species in Hill Creek.



Hill Creek near Dale Kuni Road

²² Coast Fork Willamette Watershed Website

²³ Creswell Parks Master Plan, August 2005

Unnamed Creeks: (W-4) & (W-6)

Several other unnamed waterways are identified in the National Wetlands Inventory. One is an intermittent stream associated with Hill Creek near Cloverdale Road. This stream is densely vegetated but appears to be dry at least part of the year. In addition, there is a waterway associated with Camas Swale Creek that has a course running from Camas Swale Road at Hurlburt Road Northeast to the Creswell Wastewater Treatment plant. This waterway appears to be only lightly vegetated.

Existing Conditions

Several of Creswell's waterways are being watched closely and show signs of negative impact. These are the Coast Fork of the Willamette and Camas Swale Creek.

The Coast Fork of the Willamette River currently provides recreational opportunities including trails, boat launch sites, and scenic river corridors. Many areas along the river are in private ownership. The Coast Fork Willamette Watershed Council is in the process of administrating an assessment of the Lower Coast Fork Willamette Watershed sub-basin. The Coast Fork is listed as a 303(d) stream, which means that it does not meet quality standards under the Clean Water Act. A Total Maximum Daily Load (TMDL) addressing the water quality limited status of the Willamette Basin was issued on September 26, 2006. No Waste Load Allocations (WLA) have been assigned to the permittee based on any in-stream violations or listings of the Willamette River or the Coast Fork Willamette River. Temperature is the most prevalent pollutant in the Coast Fork sub-basin.²⁴

Camas Swale Creek is also listed as a 303(d) stream. The creek is listed because of unusually low levels of dissolved oxygen. The TMDL for Camas Swale Creek has not been completed and when it is approved, there may be waste load allocations assigned to this source for oxygen demanding pollutants.²⁵

Although not listed as a 303 (d) stream, Hill Creek's proximity to major transportation corridors such as I-5, Highway 99, and the Railroad, as well as recent and planned development along or near its banks, make the creek a critical location for protection measures.

Creswell currently has a number of stream protection measures in place. The City of Creswell's TMDL Implementation Plan lists the following existing programs and policies addressing water quality:

- Pet waste pick-up ordinance
- Leaf pick-up program
- Landscaping standards (Creswell Development Code)
- Erosion control standards (Creswell Development Code)

Considerations for the Future

Adverse impacts to Creswell's rivers and streams that may result from development projected for the area are increased impervious surface areas that will contribute more pollutants through additional run-off and loss of infiltration capacity. According to Creswell's TMDL Implementation Plan, the highest priority focus areas for pollutant reduction in the Coast Fork Willamette River are Riparian Protection and Restoration, Education and Training, as well as Stormwater Planning and Management (see Table 1). Analysis of existing policies and programs indicates

²⁴ City of Creswell DRAFT TMDL Implementation Plan

²⁵ Oregon Department of Environmental Quality, 2007

that Creswell should focus on protecting and restoring streamside vegetation and also strengthening the mechanisms designed to minimize erosion. Some aspects of these efforts can be integrated into stormwater planning as well as other existing plans and programs.

Table 1: Pollutant Reduction Focus Areas for the City of Creswell

Strategy Category	Priority Rating
Riparian Protection and Restoration	High
Education/ Training	High
Stormwater Planning and Management	High
Erosion Control	Medium
Illegal Discharge	Medium
Animal Waste Management	Medium

(Source: Creswell TMDL Implementation Plan)

Riparian

According to the Creswell Development Code, riparian areas are lands adjacent to rivers, streams, lakes, ponds, and other water bodies. They are transitional between aquatic and upland zones, and contain elements of both aquatic and terrestrial ecosystems. They have high water tables because of their close proximity to aquatic systems, soils that are usually made up largely of water-carried sediments, and some vegetation that requires free (unbound) water or conditions that are more moist than normal.

Riparian zones can provide a variety of ecological functions. They are an important place for rearing fish, amphibians, and birds because they have an abundance and diversity of food sources. Forested riparian zones provide shade, which prevents streams from heating due to direct exposure to sunlight. Trees and branches that fall into the water contribute large woody debris (LWD), which creates cover for fish and helps form pools and trap gravel important for spawning habitat. Leaf litter, seeds, fruit, and insects that drop into the water from the riparian zone form the basis of the food chain in many streams. Vegetation in riparian zones also helps filter out sediment and pollutants during certain times of the year, preventing it from entering waterways. The root structure of riparian vegetation contributes to stream bank stabilization and helps to prevent erosion. Common riparian zone plants include Oregon ash, willows, dogwood, vine maple, sedges, rushes, and grasses.²⁶

Existing Conditions

The Creswell Development Code contains a Riparian Protection and Wetlands Overlay (RPW) zoning district. The purposes of this overlay zone are to: 1) protect and enhance water quality, 2) achieve and maintain federal and state laws, 3) protect plant and animal species, and 4) limit development activity in riparian corridors and wetlands. Areas protected by this overlay zone include land within the river channel's banks and the protective overlay zone as measured from the top of the bank, which includes a 75-foot buffer for streams with an average stream flow of 1,000 cubic feet per second (CFS) and a buffer of 50-feet for streams with less than 1,000 CFS. The Water Features map presents buffers along the rivers, streams, lakes, and wetlands in Creswell. The Coast Fork has a 75-foot buffer; all other features have a 50-foot buffer.

²⁶ Watershed Network Professionals, 2004

Removal of vegetation within the RPW Overlay is prohibited except when existing vegetation is replaced with native riparian species for restoration, non-native species are removed and replaced with native species, or hazardous trees are removed.²⁷ Any development or vegetation removal within the RPW Overlay requires approval from the City of Creswell, and possibly Department of State Lands and Army Corps of Engineer approval. Submittals must include a survey of existing vegetation and proposed changes.

Soils listed as hydric or that have inclusions of hydric soils (as listed by the Natural Resource Conservation Service) are included within the RPW Overlay.

Considerations for the Future

Losses of mature riparian vegetation can cause elevated summer stream temperature due to increased exposure to sunlight. Riparian vegetation is also critical for controlling stream bank erosion. Activities designed to protect and restore riparian areas along with appropriate stormwater management strategies will lessen the amount of land vulnerable to excessive erosion while also reducing the erosive action of runoff and the amount of sediment being transported.

The City has identified three specific areas to implement riparian restoration projects. Creswell is building a new water treatment plant along the Coast Fork and will undertake restoration planting once this project is complete. The City also owns two conservation easements and is committed to preserving the natural state of these areas, located along drainages. The area adjacent to the ditch that conveys wastewater effluent to Camas Swale Creek is a priority for riparian planting. Partnerships with the Coast Fork Watershed Council and other organizations will further efforts related to riparian area quality and function.²⁸

Riparian Habitat

Habitat areas are defined in the Creswell Development Code as lands with significant food, water, or cover for native terrestrial and aquatic animal species.

Existing Conditions

Creswell's rivers, lakes, and streams are home to a number aquatic and water dependent species. These include steelhead, Chinook, and Coho salmon, rainbow and cutthroat trout, native chub, pan fish, nutria, beavers, western pond turtles, ducks and migratory birds. The 1982 Comprehensive Plan indicates that the Lane County Audubon Society identified 90 - 100 bird species around Creswell in the 20 years prior to that Plan.

A flood control project diverting flow of Lower Hill Creek under Highway 99 to Lynx Hollow Road creates passage problems for fish attempting to migrate directly into Upper Hill Creek. The amount of flow diverted into the raceway acts as a velocity barrier to migrating cutthroat trout for much of the spawning season. Cutthroat trout have been documented above the diversion, so passage is possible during period of lower flow.

The Coast Fork Watershed Council along with Oregon Department of Fish and Wildlife (ODFW) is leading efforts to restore 11 acres of Garden Lake Park to native riparian and upland habitat. The Garden Lake area, which is home to a variety of water birds, raptors and migrating

²⁷ See Creswell Development Code, Section 2.10.300.A.1, page 2-99, for complete language

²⁸ City of Creswell DRAFT TMDL Implementation Plan

songbirds is planned to be restored by removing blackberry, Scotch broom, and English ivy, and replanting native trees and shrubs, and monitoring water quality, plant, and animal populations.²⁹

Considerations for the Future

Historic observations indicate particular concern for riparian vegetation maintenance along waterways as habitat for fish and bird life. There is also concern for the loss of Camas Swale for migratory refuge, and other loss of suitable areas that provide nesting and feeding areas for wildlife.

Wetlands

Wetlands are transition areas between dry land and open water where the water table is usually at or near the surface or the land is covered by shallow water all or part of the year. All wetlands have three common characteristics:³⁰

- 1) Wetlands are sometimes or always covered with water
- 2) Wetland soils are hydric, meaning they are poorly drained and contain little or no oxygen
- 3) Wetlands contain hydrophilic plants that can survive with little or no oxygen

The Creswell Development Code defines wetlands as an area that is inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soils conditions. Wetlands include swamps, marshes, bogs, and similar areas.

Wetlands ecosystems are like riparian ecosystems in that they share similar functions. Wetlands play a vital role in a healthy ecosystem. They control flooding, store floodwater, provide a home to diverse wildlife, filter pollutants from runoff, and provide recreational opportunities.

All of the water features discussed above have wetlands associated with them. The Water Features map represents information from the National Wetlands Inventory (NWI).

Existing Conditions

The Creswell Development Code contains a Riparian Protection and Wetlands Overlay (RPW) zoning district. Implementation of the wetlands component of this Overlay zone is limited until a Local Wetlands Inventory (LWI) is completed. An LWI is a comprehensive survey of all wetlands inside the UGB. Counties must coordinate for areas that are outside of the city limits but inside the UGB. Areas outside UGBs do not require new inventories or the Goal 5 process, but must adopt the statewide wetland inventory and notify the Department of State lands (DSL) about any proposed development affecting inventoried wetlands. Until such time as the City completes and adopt a LWI, documentation of wetlands in Creswell is limited to the National Wetlands Inventory or site-specific development.

Quamash Prairie, located north of Creswell and just south of Short Mountain Landfill, is a wetlands mitigation site owned by Lane County. The Lane County Public Works Department established the 200-acre site as a wetlands mitigation bank in conjunction with an expansion of

²⁹ Coast Fork Willamette Watershed Council Website

³⁰ Oregon Division of State Lands, 2007

Short Mountain Landfill to compensate for wetlands that would be lost as a result. It is likely that the site will be managed and maintained by Lane County parks once restoration is complete.³¹

Considerations for the Future

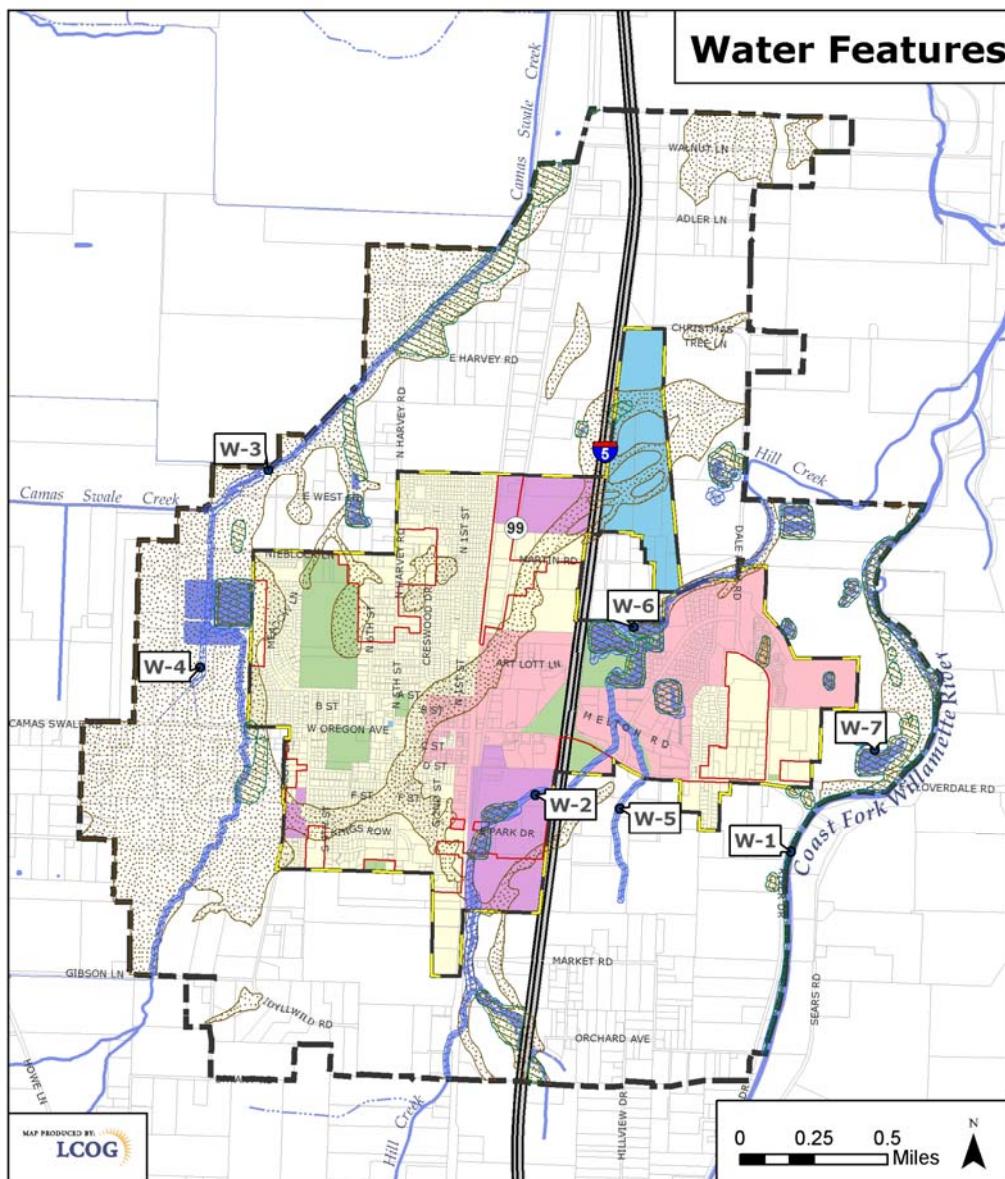
The Environmental Evaluation and Strategies section of the Region 2050 project finds that whereas 24.1 acres of Wetlands existed within Creswell's UGB in the year 2000, that number would nearly quadruple to 82 acres in 205, given the growth scenarios suggested in the Region 2050 project.

When a wetland inventory and protected land designations are not in place, a city may have significant resource sites included in its buildable land supply. These sites may not have been developed thus far because of physical constraints, such as wetlands. Completing a wetland inventory and plan allows for more certainty and shorter decision-making time-lines, positive outcomes for local governments, developers, and property owners alike.³²

In the future the City of Creswell should complete an LWI. In the wetland provision of Goal 5, cities are required to conduct and adopt an LWI according to guidelines established by DSL.

³¹ Lane County

³² Planning for Natural Resources, Oregon Chapter APA, August 2004



Legend

- Study Area
- Urban Growth Boundary
- City Limits
- Tax Lots

- Hydrologic Features**
- Water Feature Points
- Wetlands with 50 foot Buffer
- Streams with 50 foot Buffer
- Hydric Soils

- Comprehensive Plan Designations**
- Residential
- Commercial
- Industrial
- Park, Recreation, Open Space
- Public Facilities / Government

Printing Date: June 19, 2007

LAND

The Creswell Development Code uses the term sensitive lands to generalize wetlands, significant trees, steep slopes, flood plains, and other natural resource areas designated for protection or conservation by the Comprehensive Plan or refinements to the Comprehensive Plan.³³

The Land Features Map utilizes slope and soil data to provide a basic visual inventory of land resources critical to Creswell's future.

Slope

It is important to document and understand the location of areas with steep slopes. Steep slopes are generally defined as land with a slope angle of 20% or greater for a minimum of 30 feet horizontally. These dynamic areas present land use challenges for their desirability as aesthetic landscape features and constrained but desirable residential development.

Steep slopes are more prone to natural disasters, are more expensive to build on, and more expensive to maintain. Slope failures, erosion, or avalanches may not be as spectacular as tornadoes or earthquakes, but they are usually more widespread. Financial losses from these mass movements of earth are costly. Development on steep slopes is often susceptible to wildfire and is more expensive and difficult to defend in case of fire.

Steep slopes are of aesthetic value to the community below as well as making for dramatic home sites. The most effective measure to prevent damage to homes from the hazards of steeply sloped areas is to limit or prohibit development in these potential hazard areas. If development is to occur in a hazardous area, the landslide potential should be disclosed to the consumer. Having disclosed the potential for landslides, the consumer then assumes the cost for any damages that may occur.

Existing Conditions

Creswell Butte (**L-1**) is a 110-acre forested out-cropping that provides important natural relief and environmental enhancement and open space for the City. The Butte is approximately 110 acres and is classified as a natural area in Creswell's Park System. Creswell Butte is the only feature in the Creswell area that exhibits slope angles of sufficient steepness to be a concern for urban development. Most of the Butte lies just south of Creswell's UGB. The Butte is comprised of multiple ownerships, with some parcels in private ownership and a sizeable portion (72 acres) held under a conservation easement by McKenzie River Trust, for ecosystem conservation and restoration.³⁴

Creswell's Development Code includes a Park, Recreation and Open Space District (PRO-S), the purpose of which is to preserve and protect park, recreation, and open space lands that contribute to the general welfare, safety, enjoyment, or economic well-being of persons who reside, work, or travel in, near, or around such lands. In addition the Creswell Development Code specifies that this zone may be established, when found necessary, in order to preserve sensitive lands.

³³ Creswell Parks Master Plan, August 2005

³⁴ Creswell Parks Master Plan, August 2005

Considerations for the Future

Increasing development pressure near Creswell Butte suggests that all or part of the Butte may become part of the City of Creswell . In order to mitigate damage to property the City should consider establishing special development standards or a Special Planning overlay zone for the areas with steep slopes on Creswell Butte. Such standards and overlay zones typically restrict development on steep-slope areas exceeding 25-30 percent.

In the future Creswell should also promote slope and soil stability and the use of natural drainage ways in areas with landslide potential by retaining existing vegetation in those areas to the greatest extent possible.

Upland Wildlife Habitat

Increased growth puts pressure on critical habitat and increases the chances for conflict with wildlife. Some of the most significant contributors to upland habitat decline are the loss of open space to urbanization, agricultural conversion, and other development patterns that often fragment habitat.³⁵

The protection of habitat is important for a number of reasons. First and foremost, the preservation of habitat is important for ecological diversity and ecosystem health. Another incentive for the protection of wildlife habitat is the threat of federal control. If a species becomes listed as threatened or endangered under the federal Endangered Species Act, the result is federal jurisdiction of that species' habitat or federal regulation of local planning and development.³³ Creswell can reduce the chance of federal intervention through careful planning.

Existing Conditions

Non-irrigated agricultural lands, including orchards, cultivated crops, and pastures, provide the most extensive wildlife habitat. Forested foothills provide habitat for upland game, deer, and elk. The 1982 Comprehensive Plan indicates concern for the higher elevations of Creswell Butte as retained upland habitat.

Considerations for the Future

As growth in Creswell places increasing pressure on areas of existing wildlife habitat, Creswell should consider requiring that development proposals recognize the value of existing on-site mature vegetation that provides wildlife habitat and preserve these resources. The Creswell Development Code allows the City to accept a land dedication or be party to a conservation easement on private property for conservation purposes. The City should also acquire and maintain an inventory of endangered and threatened species, and should notify applicable state and federal natural resource protection agencies of development proposals potentially impacting listed plant and animal species.

High Value Soils

Agricultural land provides more than simply food production and economic benefits. It also provides open space, wildlife habitat, and water recharge, along with other amenities such as visual quality and landscape diversity. Ranches and farms compose a landscape that is habitat

³⁵ Wilmer, Ralph. "The Importance of Planning for Wildlife Habitat Protection." December 2004

for deer, elk, and many species of birds. Rain and snowmelt seep back into the groundwater in agricultural areas instead of being evaporated on driveways and parking lots.

Existing Conditions

As Creswell's population continues to grow, more agricultural land is lost to development. This pressure will increase in the future. The Land Features Map shows where high value soils (Class I and II) are located in and around Creswell.

Considerations for the Future

As Creswell strives to preserve and promote its "small town atmosphere" and "surrounding natural beauty" in the face of growth, several tools will be useful to specifically protect agricultural land, such as agricultural districts, conservation easements, and transfer of development rights.

Flood Plains

A flood plain is a low-lying area adjacent to a river that is comprised primarily of river sediment and is subject to flooding. Flooding can be fast or slow, but usually develops over a period of days. Development often occurs in the flood plain as the same environmental conditions that are conducive to farming are also attractive for urban development. Some of the most desirable agricultural lands in the Willamette Valley are in flood plains, as well as recent residential development.

In the past, flooding was not as catastrophic as it is today because there was a smaller population living in the flood plain and runoff was kept in check by vegetation. As the population in flood plains has increased, so has the damage caused by flooding.³⁶ Additional information and detail regarding floodplains in Creswell can be found in the City's recently completed Natural Hazards Mitigation Plan.

Existing Conditions

Annual flooding was a constant struggle for early settlers in the Creswell area. The flood history of Creswell and Goshen ranges over many years.³⁷ The development of the railroad in 1872, impacted the decision of many Cloverdale residents to move toward the tracks, and this is where the city of Creswell is today.

Channelization of the Coast Fork Willamette River occurred in the 1950s in response to repeated flooding. Modifications included levees, rip-rap at weak points and culverts to drain adjacent fields. In the early 1960s a diversion channel for flood control was constructed on Hill Creek. The creation of the Creswell Ponds (currently the Garden Lake Park area) was the by-product of quarry pits created during the construction of Interstate 5 during the late 1950s and early 1960s. The result of these projects has been decreased flooding in portions of the watershed adjacent to the Coast Fork of the Willamette River.

The Creswell Development Code has a Flood Plain Overlay Zone, the purpose of which is to minimize property loss, danger of injury, and health hazards.

³⁶ Coast Fork Willamette Watershed Council Website

³⁷ Register Guard Newspaper, December 1946



Development on the western edge of Creswell

Considerations for the Future

The Environmental Evaluation and Strategies section of the Region 2050 project suggests that whereas 187 acres of flood plain existed within Creswell's UGB in the year 2000, that number would increase to 510 acres in 2050 (due to UGB expansion), given the growth scenarios suggested in the Region 2050 project.

Development in flood plains may impact wetlands and their vital ecological functional (filtering pollutants out of surface water before discharging into water bodies.) Without adequate preventative measures, development within the flood plain may limit habitat restoration opportunities and implementation of best management practices needed to help meet TDML requirements.

Proper planning can help communities avoid the damage, devastation, and costs associated with flooding. A comprehensive plan that relates use of the land to the land's hazards is important. Hazardous areas such as flood plains may be reserved as parks, greenways, or other open spaces. Development ordinances can be used to restrict development in floodplains.

Significant Vegetation and Trees

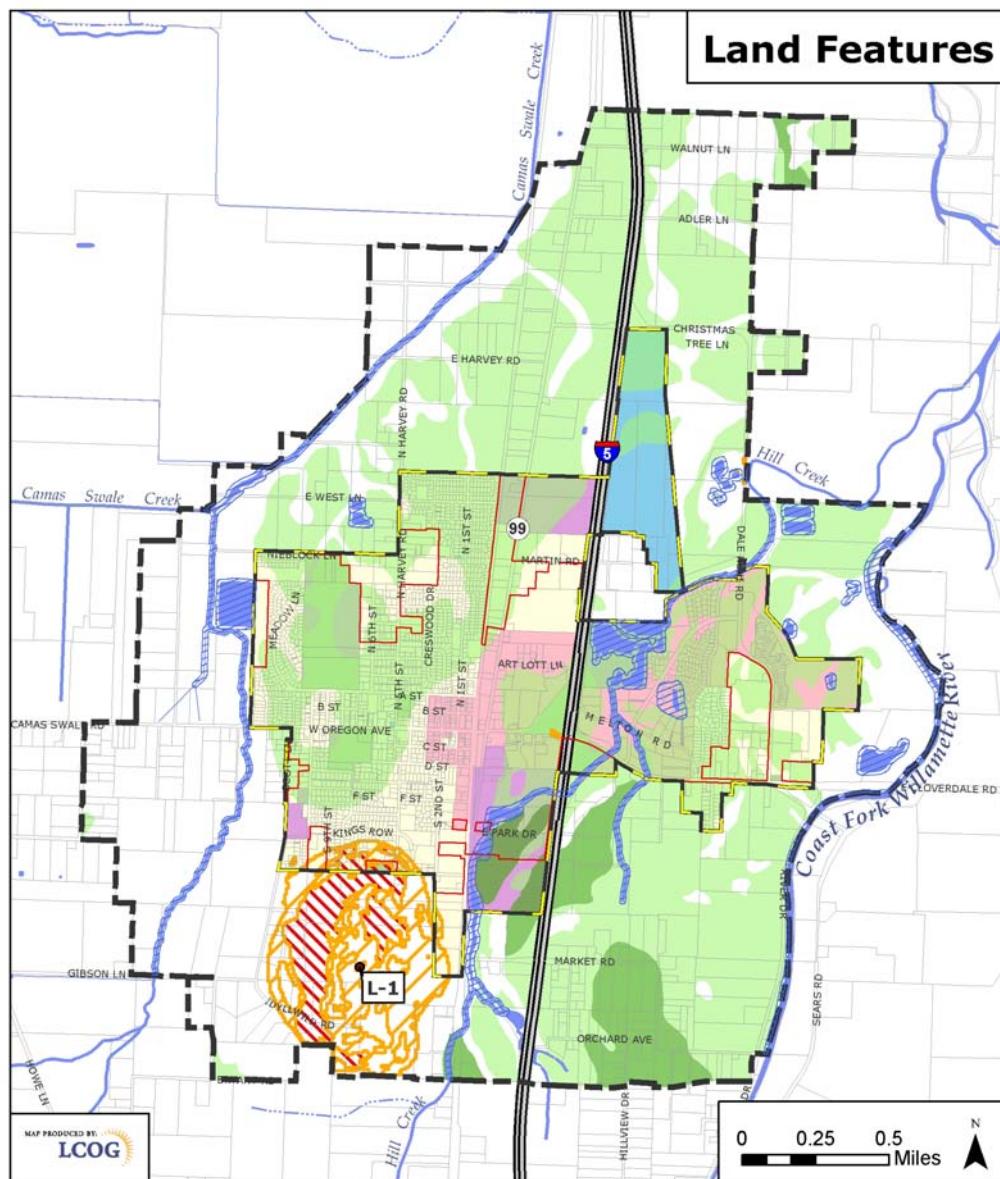
The Creswell Development Code defines significant vegetation and trees as plants within designated sensitive land areas such as flood plains and wetlands, and trees not within such areas that have a caliper of six (6) inches or larger. Protection does not apply to non-native, invasive plants. The purpose of retaining significant vegetation and trees is to 1) promote community health, safety, and welfare by protecting natural vegetation, 2) incorporate significant native vegetation into developments, 3) protect vegetation in sensitive natural areas, and 4) minimize the risk of erosion, landslide, and stormwater runoff. Mature vegetation provides summer shade and wind breaks, controls erosion, and allows for water conservation due to larger established root systems.

Existing Conditions

The use of mature, native vegetation within developments is a preferred alternative to removal of vegetation and re-planting. The City requires development proposals to recognize existing on-site mature vegetation and preserve these resources to the maximum extent practicable. During planning review of land use applications, the City conducts a review of significant areas of natural vegetation and their preservation.

Considerations for the Future

As growth in Creswell places pressure on areas of significant vegetation and trees, the City should review the Creswell Development Code to ensure protection significant vegetation and tree to the maximum extent practical. The Creswell Development Code allows for the City to accept a land dedication or be party to a conservation easement on private property for conservation purposes. The City should also initiate and maintain an inventory of significant vegetation and trees, and should notify developers regarding preservation. This would add predictability to the development process.



Legend

- | | | |
|-----------------------|--|---------------------------------|
| Study Area | Landfeatures | Comprehensive Plan Designations |
| Urban Growth Boundary | Steep Slopes | |
| City Limits | 15% - 25% | Residential |
| Tax Lots | 25%+ | Commercial |
| High Value Soils | Streams and Wetlands with 50-foot Buffer | Industrial |
| Class 1 | | Park, Recreation, Open Space |
| Class 2 | | Public Facilities / Government |
- Printing Date: June 19, 2007

ADDITIONAL CONSIDERATIONS

Although not addressed in this Report in detail, there are several additional elements of Creswell's natural environment that should be given consideration with regards to future growth and future compliance with Goals 5 and 6. These include:

- What are Creswell's opportunities for establishing sections of the Coast Fork of the Willamette River as an Oregon State Scenic Waterway?
- What opportunities and challenges are presented by Goal 15, which preserves and protects the Willamette River Greenway?
- What are Creswell's opportunities and challenges in establishing Approved Oregon Recreation Trails in the area?
- What are Creswell's current energy sources and how will the City provide reliable energy into the future?

NATURAL ENVIRONMENT GOALS AND POLICY RECOMMENDATIONS

Natural Environment Goals:

- Maintain the quality of air, water and land resources in support of a small community with individuality, scenic values and rural atmosphere.
- Maintain and promote a safe, healthful, and attractive environment for the citizens of Creswell.
- Recognize the opportunities and constraints posed by the natural environment in order to protect the unique resources of the area while ensuring that future development will not result in adverse impacts on the natural environment.
- Ensure compliance with the provisions of a Statewide Planning Goal 5 pertaining to natural resources.
- Inventory the UGB to identify areas with significant wildlife habitat value and periodically update this inventory.
- Minimize or prevent loss of riparian vegetation.
- Manage the identified open space, wildlife habitat, and ecological/scientific areas in order to preserve their unique qualities.
- Preserve natural resource areas through such provisions as public acquisition or conservation easements.
- Protect sensitive environmental features such as steep slopes, wetlands, and riparian lands.
- Protect the Coast Fork of the Willamette River and its banks as a vital open space, fish and wildlife habitat and recreation resource of the community.
- Secure and maintain public access to rivers and stream areas when possible.
- Work with federal, state, and county agencies to establish nature trails and river access.
- Minimize the introduction of pollutants into ground and surface water.
- Develop and implement improved stormwater management requirements to enhance water quality.

Air, Land, and Water Policy Recommendations (Goal 6)

General

- It is the intent of the City to continue to comply with all applicable state and federal laws and regulations concerning air quality, water quality, and noise.
From the 1982 Comprehensive Plan
- The City will not approve any new development [that] will violate state and federal laws and regulations concerning air quality, water quality and noise.
From the 1982 Comprehensive Plan
- The City shall require that waste and process discharges from future development (when combined with discharges from existing development) will not exceed the carrying capacity, or degrade or threaten the availability of air, water, and land resources.

Air

The City shall

- Ensure future maintenance of Creswell's air quality and associated airshed quality by coordinating with the Lane Regional Air Pollution Agency (LRAPA) for continued assessment of local air quality and proposed community activities [that] may introduce a source of air contamination particularly any source of particulate emissions.
From the 1982 Comprehensive Plan
- Ensure that any industrial development with a significant air contaminant discharge be reviewed by the DEQ for determination of the impact on the Creswell, and Eugene-Springfield airsheds.
- Encourage the maintenance and improvement of the City's tree canopy to improve air quality.
- Encourage industrial development of a non-polluting type
From the 1982 Comprehensive Plan
- Provide information to new and expanding industries on airshed characteristics and existing pollution levels.
- Encourage industrial developments with significant air contaminant discharges to undertake measures that reduce air pollution and its impact through such measures as:
 - a) using appropriate buffer areas and vegetation.
 - b) Locating the discharge source where the impact is minimized.
 - c) using state of the art pollution abatement equipment and production processing technology to reduce emissions.
- Cooperate with other local governments in the region and DEQ to ensure air quality.

- Encourage the improvement and upgrading of city streets and parking areas to urban standards to improve air quality.

From the 1982 Comprehensive Plan

- Work with DEQ and the Fire District regulatory system for control of open burning while working with surrounding jurisdictions to reduce the need for field burning areas adjacent to urban development.
- Continue to give special consideration in land use decisions to the proximity of industrial uses to those centered around sensitive populations in Creswell.
- Work with the LRAPA to assess the need for local monitoring of air quality as growth in the Creswell area continues.
- Request the LRAPA to inform the City of regulations and rule changes that affect Creswell air quality and area industries.
- Require that development proposals with significant noise generating elements demonstrate compliance with City noise standards.
- Require each new or expanding industry with noise-generating operations or equipment to meet state and local noise regulations.
- Separate noise-sensitive uses and noise-generating uses as much as is practicable.
- Locate, design, and buffer noise-generating land uses such as major transportation facilities and industrial areas to protect both existing and potential noise-sensitive uses.
- Encourage special construction, design, and buffering techniques for new noise-sensitive development, in areas where that development would be impacted by noise.
- Minimize future noise impacts from roads and highways through the use of increased rights-of-way (for arterials, limited access expressways), landscaping, sunken road design, berms, etc.

Water

The City shall:

- Require that all new or expanding developments to comply with applicable water quality standards, using assistance where available from the Department of Environmental Quality, county Environmental Health Departments, etc.
- Cooperate with local, state, and federal agencies that have primary responsibility to assist in minimizing the quantity of pollutants (from point or non-point sources) entering the surface streams, lakes, and groundwater.
- Encourage state and county health agencies to monitor water quality in local streams, lakes, and aquifers to publicize any findings of potential public hazard and to provide background level information.

- Support and coordinate with state and federal agencies' plans to contain and subsequently clean up toxic waste spills and/or contamination of area surface or ground waters.
- Wherever feasible, facilitate the extension of sanitary sewer systems to areas within the Urban Growth Boundary where failing septic systems are causing groundwater or aquifer pollution problems, provided commitments to annexation can be obtained.
- Enforce measures aimed at controlling erosion and sedimentation associated with construction and development activities to protect water quality.
- Where feasible, use open, naturally vegetated drainage ways to reduce stormwater and improve water quality.
- Maintain and/or meet DEQ wastewater discharge standards to prevent degradation of receiving stream water quality.

From the 1982 Comprehensive Plan

- Review any treatment facility plans to ensure compliance with federal, state, and local water quality standards.
- Develop policies in conjunction with Lane County and state agencies to protect the aquifer from which Creswell obtains much of its water. .
- Pursue efforts to reduce heat loading, bacteria loading and mercury contributions to tributaries of the Coast Fork of the Willamette River through measures including:
 - a) Continued application of the Riparian Protection and Restoration Overlay
 - b) Pursuing Camas Swale Creek as priority for riparian planting
 - c) Bolstering existing pet waste pick-up ordinance by installing at least four pet waste pick-up stations and encouraging compliance and attempting better enforcement.
 - d) Incorporating greater water protection measures into the Stormwater Master Plan to encourage Best Management Practices in new developments.
 - e) Apply Erosion Control provisions to ensure that developments that disturb one acre or more have submitted necessary documentation to DEQ to ensure compliance with 1200-C requirements
- Protect and enhance groundwater resources within the Urban Growth Boundary by providing wastewater collection and treatment facilities and phase out existing septic systems.

From the 1982 Comprehensive Plan

- Protect City well field sites from surface and subsurface waters

Land

The City shall

- Separate and/or buffer land use activities that result in conflicting impacts on the air, land, or water to minimize the negative effects of the conflicting activities.
- Take into consideration the cumulative waste and process discharges from proposed future development, when combined with such discharges from existing developments, so that new development will not violate, or threaten to violate applicable state or federal environmental quality statutes, rules and standards.

Natural Resources Recommendations (Goal 5)

The City should

- Conduct a Local Wetlands Inventory as outlined by the Oregon Wetland Planning Guidebook 3.0, *Conducting Local Wetland Inventories and Determining Significant Wetlands*.
- Protect fish and wildlife habitat along stream corridors by managing the riparian habitat and controlling erosion, and by requiring that areas of standing trees and natural vegetation along natural drainage courses and waterways be maintained to the maximum extent possible.
- Protect in-channel vegetation (i.e., the bank vegetation between the water's edge and the topographic break at the level of the surrounding terrain) through the implementation of existing development standards and the City's planning review procedures.
- Protect natural ponds, sloughs, wetlands, rivers, and streams (including intermittent ones) to maintain existing surface water drainage patterns and to maintain the water quality benefits derived from such natural water bodies.
- Encourage the maintenance of riparian vegetation along the Willamette River as habitat for animal and bird life.
From the 1982 Comprehensive Plan
- Assess the significance of fish and wildlife habitats in and near Hill Creek and develop protective policies and regulations, consistent with Statewide Planning Goal 5.
- Restrict development of land that requires channelization, excessive removal of stream side vegetation, alteration of stream banks and filling of stream channels.
- Investigate opportunities to use designated greenways along select water courses to protect natural vegetation and water resource values and provide public pedestrian/bicycle access where physically practical.

- Require that development proposals recognize the value of existing on-site mature vegetation and preserve these resources to the maximum extent practical.
- Investigate opportunities to preserve significant areas of natural vegetation to the maximum extent possible through the planning review process.
- Notify applicable state and federal natural resource protection agencies of development proposals potentially impacting endangered or listed plant and animal species.
- Establish special development standards or a special planning overlay zone for the areas with steep slopes on Creswell Butte.
- Promote slope and soil stability and the use of natural drainage ways in areas with landslide potential by retaining existing vegetation in those areas to the greatest extent possible.
- Restrict development on steep slope areas. Limited development may be allowed when it can be shown through a detailed site specific study that environmental problems that result from development can be successfully mitigated.
- Encourage proper care and maintenance of trees by providing educational materials to property owners concerning tree health and maintenance.
- Coordinate with Lane County to encourage the maintenance of the natural vegetation and open space character of those portions of Creswell Butte that are outside the Urban Growth Boundary since it is a recognized significant scenic element.
- Pursue the feasibility of utilizing tools for the protection of prime agricultural land, such as agricultural districts, conservation easements, and transfer of development rights.
- Aggregate resources identified within the Urban Growth Boundary are not of sufficient quantity to warrant resource protection policies.

From the 1982 Comprehensive Plan

- Continue partnerships and support of efforts to restore wetlands and riparian vegetation along the City's lakes and streams.
- Also acquire and maintain an inventory of endangered and threatened species, and should notify applicable state and federal natural resource protection agencies of development proposals potentially impacting listed plant and animal species.
- With the assistance of the State Department of Environmental Quality, Lane County, and other agencies, inventory water lake systems for size, depth, water quality, bank stability, nutrients, etc