

# ENVIRONMENTAL ELEMENT

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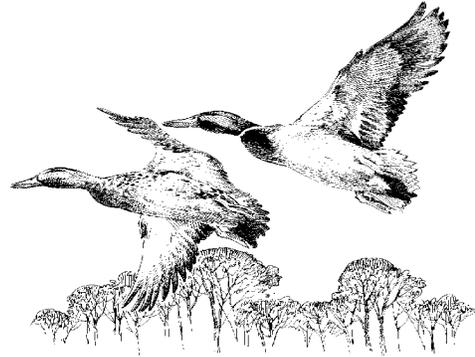
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## **INTRODUCTION**

### **PURPOSE**

An issue in many Northwest communities is the declining environmental quality that accompanies urban growth. The Bear Creek Valley has an abundance of diverse natural resources that provide recreation, wildlife habitat, and valuable urban open space, and contribute to the quality of life in Medford. Urbanization has negatively impacted the valley's natural resources, and, therefore, our quality of life. Diminishing supplies of developable land have forced many communities such as Medford to face the difficult challenge of balancing natural resource protection with the needs and rights of property owners and competing land uses. The impacts of development on the natural environment and its scenic values are evident. Cities, farms, drainage projects, dams, channelized streams, and roads have shaped the local landscape. In many instances, development has out-stepped environmental planning efforts.



This “Environmental Element” of the *Medford Comprehensive Plan* provides goals, policies, and implementation strategies for improving and maintaining environmental quality in Medford, while accommodating continued growth. The *Statewide Planning Goals* that oversee the protection and conservation of natural resources in Oregon are *Goal 5: Open Spaces, Scenic and Historic Areas, and Natural Resources*, and *Goal 6: Air, Water and Land Resources Quality*. Consistent with the objectives of Goals 5 and 6, the “Environmental Element” is a guiding document that strives to protect the natural environment and ensure that long-term growth does not adversely affect the natural resources that contribute to Medford’s livability. Other *Statewide Planning Goals* that are pertinent to the “Environmental Element” include *Goal 3: Agricultural Lands*; *Goal 7: Areas Subject to Natural Hazards*; and *Goal 13: Energy Conservation*. Most of these *Statewide Planning Goals* are also addressed in other elements of the *Comprehensive Plan*, such as in the “Public Facilities Element,” and in related plan documents such as the *Medford Parks, Recreation, and Leisure Services Plan*, and the *City of Medford Natural Hazards Mitigation Plan*.

An overriding concept in the goals, policies, and implementation strategies in this element is to incorporate *preventive*, rather than *corrective* measures in land use planning. The goals, policies, and implementation strategies emphasize the importance of developing and maintaining an integrated open space system that incorporates parks and recreation, biological resources, agriculture, and waterways. They must be evaluated and updated regularly, with new information added to the “Environmental Element” as necessary.

### **GOAL 5**

The “Environmental Element” is primarily guided by the provisions set forth in *Statewide Planning Goal 5*, which outline policies and objectives for local land use planning to better protect and restore natural resources. Goal 5 is a broad *Statewide Planning Goal* that covers over a dozen resources, including riparian corridors, wetlands, wildlife and fish habitat, mineral and aggregate resources, energy sources, natural areas, scenic views and sites, open space,

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ground water resources, wilderness areas, historic resources, cultural areas, adopted Oregon Recreation Trails, and federal Wild and Scenic Waterways. The “goal” of Goal 5 is: “*To protect natural resources, and conserve scenic and historic areas and open spaces.*”<sup>1</sup> Its provisions provide a critical framework for local land use regulation, particularly in growing urban areas such as Medford.

Goal 5 requirements are contained in the *Oregon Administrative Rules* (OAR) 660, Divisions 16 and 23. Recent (1996) revisions to these OARs call for reform of the conservation efforts of the resources originally covered by the Goal, with an increased emphasis on the protection of three specific resources: wetlands, riparian areas, and wildlife habitat. The means to achieve the objectives of Goal 5 must be set forth in Medford’s land use guiding documents: the *Comprehensive Plan* and *Land Development Code*.

A fairly recent concept directing resource planning in many urban areas entails reclaiming existing streams, drainageways, wetlands, and canals to serve several functions. These may include stormwater filtration, flood control, preservation of fish and wildlife habitat, and as greenways with paths to link land uses. Preservation of a city’s waterways assists in fostering sustainable urban growth, in satisfying the requirements of Goal 5, and in attaining federal and state environmental quality standards. The City of Medford is exploring these possibilities and pursuing policies and strategies to take advantage of existing waterways, ultimately balancing environmental concerns with development needs.

To comply with Goal 5, a plan or course of action that prohibits, limits, or allows uses that may adversely affect a significant Goal 5 resource must be adopted as part of the *Comprehensive Plan* and *Land Development Code*. These may include zoning standards, easement requirements, clustered development, preferential assessments, or public acquisition of land or development rights.<sup>2</sup> For example, the cities of Eugene, Oregon, and Chico, California, have developed and implemented comprehensive Natural Resource zoning districts, Resource Conservation Areas, or Waterside Protection ordinances.<sup>3</sup> Medford’s Bear Creek Overlay Zoning District, adopted in 1989, was replaced with a riparian corridor ordinance, adopted in 2000. This ordinance provides protections for streams that provide habitat for salmon and steelhead, including Bear Creek, Larson Creek, and a portion of Lone Pine Creek. Certain wetland areas in Medford would be protected through a proposed wetland protection ordinance.

## FORMAT

The “Environmental Element” is divided into four major sections: *Physical Characteristics; Natural Resources; Archaeological and Historic Resources;* and *Disasters and Hazards*. Except for the Natural Resources section, each section concludes with *Conclusions and Goals, Policies, and Implementation Measures* that pertain to the resources or issues analyzed in that section. The Natural Resources section is further subdivided into *Air Quality, Water Quality/Wetlands/Wildlife Habitat, Soils, and Energy*, each with their own Conclusions and Goals, Policies, and Implementation Measures. As in many urban areas, water quality, wetlands and wildlife habitat are highly interrelated in Medford, where a majority of the important habitat exists near waterways. The “Environmental Element” ends with several Appendices containing

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<sup>1</sup> *Oregon’s Statewide Planning Goals and Guidelines*, 1995 Edition, Oregon Department of Land Conservation and Development.

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inventories of various resources and a list of environmental agencies and laws.

### PHYSICAL CHARACTERISTICS

This section of the “Environmental Element” discusses Medford’s physical characteristics, including location, climate, and geology, and presents the Conclusions and Goals, Policies, and Implementation Measures pertinent to these factors.



#### LOCATION

Medford lies within the upper Rogue Valley, bounded by the Siskiyou Mountain Range to the south, the Cascade Mountains to the east, and the Coast Range to the west. The Rogue Valley has the lowest precipitation among Oregon’s western interior valleys, with Medford averaging about 20 inches of rain per year.<sup>2</sup> Bear Creek, one of the Rogue River’s primary tributaries, flows through the City of Medford, which has an elevation of 1,300 to 1,400 feet. The Pacific Ocean lies approximately 80 miles to the west.

Medford (Township 37 South, Ranges 1 and 2 West, of the Willamette Meridian) is located in Jackson County, one of Oregon’s southernmost counties, abutting California. For the smaller outlying communities, Medford is the only nearby city of substantial size. Consequently, Medford has developed into a regional service center. As the Jackson County Seat, Medford provides governmental, commercial, and medical services for an estimated market area of 400,000 to 450,000 people - a population area extending to the coast, into Northern California, and on both sides of the Cascades in Southern Oregon.<sup>3</sup> It is anticipated that Medford’s role as a regional service center will continue into the future.

Medford’s location in the Rogue Valley first attracted settlers and commerce in the mid-1800s. Resources such as gold, timber, and agricultural products led to economic “booms” in the late 1800s and early 1900s. (See the “Economic Element” of the *Comprehensive Plan* for a full description of Medford’s economic history.) While its position as a regional service center is advantageous for Medford’s economy, it can conflict with the goal of conserving and sustaining natural resources. As noted in the 1996 *Comprehensive Medford Area Drainage Master Plan*:

*“Until the 1800’s, the Medford area consisted largely of ponderosa pine and grassland, interrupted by a large number of wetlands. After about 1860, settlers arrived in increasing numbers from the east. They logged forests, plowed under native grasses, and drained wetlands. These actions increased the erosion of topsoil and decreased the habitat available for native species. Although the effects on the natural hydrological cycle were limited at first, they were greatly*

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<sup>2</sup>Local Wetlands Inventory and Oregon Freshwater Assessment of Method Analysis, City of Medford, Brown and Caldwell and Woodward-Clyde Consultants, October 1995.

<sup>3</sup>“Medford now finds stores fruitful”, *The Oregonian*, December 26, 1996.

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*accelerated as urbanization increased in the early twentieth century, bringing with it increased density of homes, businesses, and industry, and the advent of paved roadways.”<sup>4</sup>*

As Medford continues to be a service center for the region’s population, the city must strive to maintain and improve the environmental quality of its air, waterways, and other natural resources, consistent with *Statewide Planning Goal 5* provisions. For example, maintaining federal air quality standards, discussed in the *Air Quality* section of the “Environmental Element,” has been difficult at times. Being a major node along the Interstate 5 corridor, with congestion from commuters and visitors, combined with the effects of wood burning and industry, led to high concentrations of air pollutants in the past.

Within Medford’s viewshed lies Roxy Ann Peak, elevation 3,571 feet, the dominating topographic feature east of the City. It is designated as an outstanding scenic resource comprising both a “scenic viewpoint” and a “scenic site” in the Jackson County *Comprehensive Plan*. Additionally, it is listed on the *Oregon Natural Areas* inventory, and is identified as winter range for black tailed deer. The 1,200-acre Prescott Park, owned and maintained by the City of Medford, encompasses Roxy Ann Peak, and functions as Medford’s premier open space. Currently Prescott Park is located outside Medford’s UGB. Because residential hillside development continues to encroach upon Roxy Ann Peak, the city must strive to preserve and protect this valuable resource, in cooperation with Jackson County.

## CLIMATE

Medford has a moderate, seasonal climate. Late fall, winter, and early spring months are damp, cloudy, and cool, influenced by marine air. Late spring, summer, and early fall are warm, dry, and sunny due to the dry nature of the prevailing winds. The Siskiyou and Coast Mountain Ranges produce a “rain shadow” effect that causes light annual rainfall. Snow falls on the valley floor occasionally; however, it is normally abundant in the surrounding mountains during the winter, providing excellent winter recreation opportunities.

Medford’s average annual rainfall had been decreasing in recent years, but this trend may be reversing. Medford’s annual rainfall was more than 30 inches in 1996 and 1997, and more than 28 inches in 1998, while the annual average over the previous 50 years was less than 20 inches. Flooding in late 1996 and early 1997 created important questions about floodplain development. This issue is discussed under *Flooding*, in the *Natural Disasters and Hazards* section below.

The average daily high temperature in Medford is between 80 and 95 degrees in the summer, and between 25 and 45 degrees in the winter. The average growing season lasts 170 days, from April 30 to October 17. Normally, winds average less than five miles per hour (mph), prevailing from the south in the winter and from the northwest during the remainder of the year. Summer thunderstorms often bring gusty winds of 40 or 50 mph from any direction. While most climatic factors are beyond control, urbanization can cause changes in atmospheric conditions. Generally, the urban climate, especially in larger cities, tends to be warmer, less windy, foggier, more polluted, and often rainier than the natural climate.<sup>5</sup> Historically, the geography and

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<sup>4</sup>*Comprehensive Medford Area Drainage Master Plan*, Brown and Caldwell, September 1996.

<sup>5</sup>*Landscape Planning: Environmental Applications*, 2nd Edition, William M. Marsh, 1991.

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climate characteristic to Medford has resulted in atmospheric inversion layers, particularly during the winter, and, consequently, increased air pollution.

Land use regulations and policies can assist in improving the quality of an urban environment. The use of preventive land use planning measures, such as minimizing paved surfaces, reducing the number of motor vehicle trips, adding vegetation and shade trees to streets and parking lots, preserving open waterways, and land use regulations that move to reduce auto use and that promote “pedestrian-friendly” neighborhoods and commercial centers assist in mitigating some of the adverse climatic conditions inherent to cities. Landscaping and waterways are assets to the community, and offset the effects of substantial concrete and asphalt, contributing to livability.

## **GEOLOGY**

The Rogue Valley is located on the edge of the Siskiyou Mountains, which are part of the Klamath Mountain Range that extends to the Pacific Ocean, and divides southern Oregon from northern California. Medford is situated on stream deposits and sedimentary rock deposited 50 million years ago, during the Eocene Epoch, and shaped primarily by erosion and other weathering forces. The Klamath Mountains are a result of processes that occurred 200 million years ago, when molten rock was injected between formations below the surface and cooled. They are composed primarily of volcanic and sedimentary materials that have been folded, faulted, and intruded, and contain intrusive (granodiorite) and metamorphic rock (schists). Subsequent erosion and other mountain-building forces occurred to produce prominent geological features near Medford, such as the Table Rocks and Roxy Ann Peak. Older marine sedimentary rock deposited during the late Cretaceous Era, about 75 million years ago, is found on the eastern margins of the Klamath Mountains, along with the oldest rock (metamorphic) found in western Oregon, possibly as old as the Triassic Era.

The Klamath Mountains are characterized by steep ridges with rugged, deeply dissected slopes, well-defined V-shaped valleys, and few undrained areas. They have elevations ranging from 2,000 to 5,000 feet, and peaks from 4,000 to 7,500 feet. Mount Ashland, at 7,533 feet, is the highest peak in the Klamath Mountain Range in Oregon. The Klamath Mountains have been continuously vegetated for 65 million years, and are home to diverse ecosystems and wildlife habitats.

The Western Cascade Mountains, which stretch toward the communities of Butte Falls and Prospect, are steeper on the east and slope more gently to the west. The terrain is characterized by slopes with rounded mountaintops that have timber-producing vegetation. Many ridge crests are 4,500 to 4,800 feet in elevation, and are composed of thick rock, with exposed outcrops. Most of the waterways in the Western Cascades drain westerly.

The more recently formed High Cascades, located to the east of the Western Cascades, contain gently rolling high plateau terrain, interrupted by glacial channels, some of which carry west-flowing streams. The High Cascades are characterized by scattered dormant volcanic peaks like Mount McLoughlin located northeast of Medford, and smaller cinder cones rising 1,500 to 6,000 feet. Bedrock lies beneath successive layers of material deposited by melting glaciers, or beneath a mantle of pumice and ash from volcanic eruptions. The Cascade Mountains generally

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have poorly defined drainage, hanging valleys, areas subject to inundation, ill-defined stream courses, and small amounts of weathered material.

The contact zones between the various geologic formations have resulted in deposits of ore that contributed to the rich mining history of the area. The United States Geological Survey (USGS) quadrangle map of the Medford area shows two particular contact zones with distinct types of deposits. The contact along the Klamath Mountains has ore deposits containing gold and quartz, and the intruded granodiorite areas near Mount Ashland have minor deposits of tungsten. Other deposits in the area include silver, molybdenum, and zinc. The contact zone along the Cascade Range provides for a greater variety of ore deposits, including manganese, clay, mercury, and coal.

The predominant rock types west of Medford are metamorphic rock in the form of metavolcanics and breccias, intrusive diorites and granodiorites, and older Cretaceous sedimentary rock. The intrusive granites are 150 million years old and the metamorphic rock is 200 million years old. To the east of Medford, the foothills consist of dark volcanic rock, andesite, and basalt, deposited when the Western Cascade volcanic chain was active.<sup>6</sup> The geologic units to the east were deposited as recently as 50 million years ago during the Eocene Era. The Table Rocks and similar formations are composed of sandstone topped with a basalt flow about one million years old. Erosion removed most of the surrounding flow leaving these spectacular rock features.

Southwest Oregon's western interior valleys, which lie in the rain shadow of the Klamath/Siskiyou Mountains, tend to contain the urban areas, communities such as Medford, Ashland, Jacksonville, Gold Hill, Eagle Point, and Shady Cove. The valleys consist of flood plains, stream terraces, and flat to gentle slopes. Most development has occurred on quaternary alluvial and fluvial deposits, which eroded from the surrounding mountains and were subsequently deposited on the valley floor. A variety of soils developed on these deposits, ranging from deep, dark-colored prairie soils on well-drained terrace locations, to rocky, drought-prone soils to the northeast of Medford.

Pursuant to Goal 5, jurisdictions must inventory *aggregate resources*, which are defined as naturally occurring concentrations of stone, rock, sand and gravel, decomposed granite, lime, pumice, cinders, and other solid materials used in construction. Although deposits of sand and gravel can be found in the northerly part of Medford in the vicinity of Bear Creek, no significant aggregate resources are known to exist in the Medford Urban Growth Boundary (UGB).

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<sup>6</sup>*Roadside Geology of Oregon*, David D. Alt and Donald W. Hyndman, 1988.

**PHYSICAL CHARACTERISTICS - CONCLUSIONS**

1. Most of the Medford planning area is located on the Bear Creek Valley floor, which is made up of floodplains, stream terraces, and flat to gently sloping land often having soils with high agricultural capability.
2. Medford has developed into a regional service center for commerce, government, education, and health care for a large geographical area because of its physical isolation from other major urban areas and location on Interstate 5, the West Coast's primary north-south travel corridor.
3. Urban growth and congestion due to Medford's position as a regional service center have had a marked influence on Medford's "western interior valley" ecosystem and its diverse natural resources. The impacts of urban growth have negatively affected the quality of the natural environment. Medford faces the difficult challenge of balancing natural resource protection with the needs of property owners and competing land uses.
4. The dominating topographic feature of the Medford area is Roxy Ann Peak, designated as an outstanding scenic resource in the *Jackson County Comprehensive Plan*, and located in the 1,700-acre Prescott Park, owned and operated by the City of Medford, but currently outside the Medford Urban Growth Boundary. Residential hillside development, both inside and outside the UGB, continues to encroach upon Roxy Ann Peak.
5. Medford's climate includes higher summer temperatures and lower average rainfall than the remainder of the region due to a "rain shadow" effect caused by the surrounding mountains.

**PHYSICAL CHARACTERISTICS  
GOALS, POLICIES, AND IMPLEMENTATION MEASURES**

***Goal 1: To improve and maintain the quality of life in Medford by using land use planning strategies that have positive effects on the natural environment.***

**Policy 1-A:** The City of Medford shall strive to minimize the negative effects of solar radiation, such as the affect concrete and asphalt surfaces have on summer air temperature.

**Implementation 1-A (1):** Review the *Medford Land Development Code*, and propose amendments for consideration by the City Council where necessary to address the negative effects of solar radiation, such as requiring adequate vegetation in development projects, requiring retention of open waterways and wetlands, etc.

**Implementation 1-A (2):** Prepare amendments to the *Medford Land Development Code* for consideration by the City Council to require preservation and maintenance of certain existing trees.

***Goal 2: To provide and maintain open space within the Medford planning area for recreation***

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*and visual relief, and to protect natural and scenic resources.*

**Policy 2-A:** The City of Medford shall acknowledge Prescott Park (Roxy Ann Peak) as the city's premier open space and viewshed, and recognize its value as Medford's most significant scenic view, currently and historically.

**Implementation 2-A (1):** Investigate inclusion of Prescott Park in Medford's Urban Growth Boundary and city limits in order to enhance public safety and the feeling of ownership by city residents, protect its natural resources, preserve and enhance convenient public access, protect the public from fire hazards, and help in establishing a network of open space corridors with recreational trails.

**Implementation 2-A (2):** Identify lands surrounding Prescott Park that are critical to ensuring long term protection and meeting open space/viewshed goals and policies, for acquisition or other types of public management. Seek funding sources.

**Implementation 2-A (3):** Consider methods to address the interface between Prescott Park and adjacent development to assure compatibility, such as a buffering program, enhanced review of city and county development applications within a specified area surrounding Prescott Park, and joint policies or an "Area of Mutual Planning Concern" with Jackson County.

**Policy 2-B:** The City of Medford shall strive to preserve and protect the visual amenities offered by the foothills.

See also Goal 8 and Implementation 8-B (1), of the "Environmental Element," Goal 2 of the *Southeast Plan* section of the "General Land Use Plan Element," and the *Parks* section of the "Public Facilities Element."

### NATURAL RESOURCES

Goal 6 of Oregon’s *Statewide Planning Goals*, “Air, Water, and Land Resources Quality,” strives “*to maintain and improve the quality of the air, water, and land resources of the state.*” This section of the “Environmental Element” discusses Medford’s natural resources, including air quality, water quality, wetlands, wildlife habitat, soils, and energy, and presents the conclusions, goals, policies, and implementation strategies pertinent to these factors. Because water quality, wetlands, and wildlife habitat are interrelated, their Conclusions and Goals, Policies and Implementation Measures are combined.

#### AIR QUALITY

Statewide Planning Goal 6 requires Comprehensive Plans to provide for the maintenance and improvement of air resources. In air sheds, such as Medford’s, that are “*described or included in state environmental quality statutes, rules, standards and implementation plans*” air emissions “*shall not (1) exceed the carrying capacity of such resources, considering long range needs; (2) degrade such resources; or (3) threaten the availability of such resources.*”<sup>7</sup>

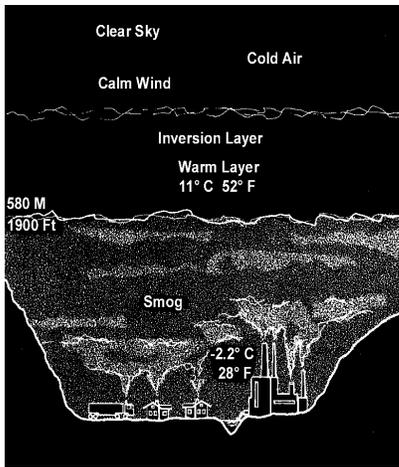
In the past, the largest sources of air pollution in the region included industry and wood stoves, which emit particulate matter and carbon monoxide. Substantial efforts (discussed below) have been made to reduce these emissions. More recently, concerns for air quality arise when smoke from regional wildfires either blows through the valley or becomes trapped during inversions. Wood stove, industrial, and motor vehicle emissions continue to be a major source of air pollution. A definite contributing factor to traffic congestion is Medford’s role as a regional retail, health, and service center. As noted previously, Medford provides services to an estimated population of 400,000 to 450,000, thereby exacerbating traffic congestion and the accumulation of air pollution from motor vehicle emissions. The number of commuters traveling to Medford for work, services, education, and recreation will continue to increase in the future, especially from outlying communities such as Ashland, Grants Pass, and Yreka, California.

Given its bowl-like shape, the Rogue Valley experiences periods of air stagnation and atmospheric temperature inversions that trap pollution, particularly during the months of November, December, January, and February. During these months, the temperature near the ground decreases rapidly toward sunset. As the surface air cools, it flows down the mountain slopes, forming a pool of cold air on the valley floor with the warmer air above acting as a lid. The cooling within this layer typically produces fog, and, as air pollutants are discharged, they become trapped. During these stagnant conditions, the fog and trapped air can remain under this “lid” for several days, becoming increasingly polluted. **Figure 1** illustrates the temperature inversion process.

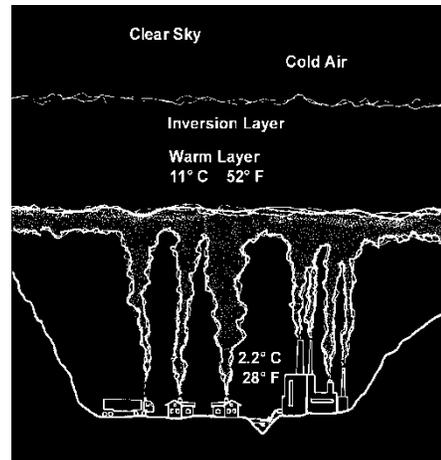
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<sup>7</sup>*Oregon’s Statewide Planning Goals and Guidelines, 2010 Edition*, Oregon Department of Land Conservation and Development.

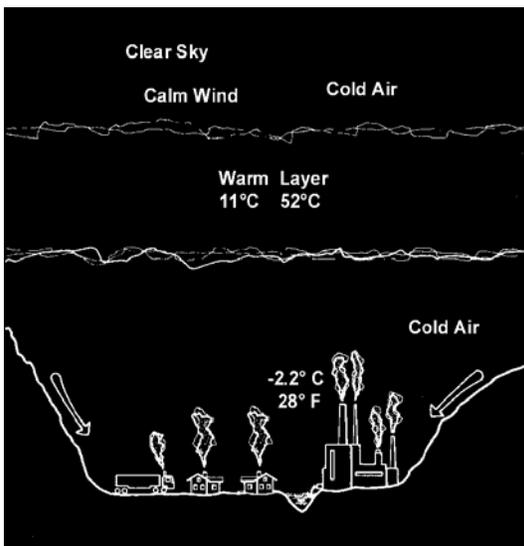
Figure 1: Temperature Inversion



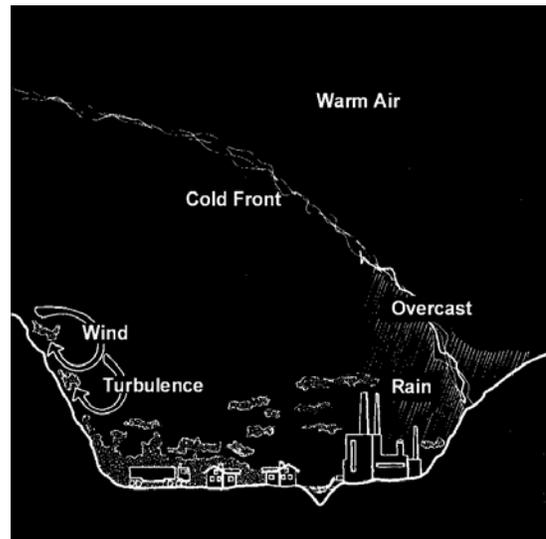
As nighttime comes, the surface air cools and moves down into the valley.



During the day, emissions rise, but become trapped by the warm air layer above.



Since there is no wind to carry the emissions away, the pollution remains under the "lid" of warmer air, accumulating until the inversion layer is broken up.



Breakup of the inversion layer may come from increased temperatures during the day, which increases the depth of the mixing layer, or from the arrival of a new air mass accompanied by stronger wind and precipitation.

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### FEDERAL AND STATE REGULATIONS

The *Clean Air Act of 1970* established the existing system of national air quality standards, and issued a generalized compliance schedule to all states. It requires the Environmental Protection Agency (EPA) to set National Ambient Air Quality Standards (NAAQS) for pollutants considered harmful to public health and the environment. The EPA has set NAAQS for seven principal pollutants, which are called “criteria” air pollutants. The seven “criteria” pollutants are: carbon monoxide (CO), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), ozone (O<sub>3</sub>), sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), and lead (Pb). As part of the *Clean Air Act*, states were required to develop State Implementation Plans (SIPs) for attaining and maintaining the NAAQS.

The federal Environmental Protection Agency (EPA) is responsible for approving or disapproving SIPs. Although the 1970 *Clean Air Act* established the NAAQS, many jurisdictions concentrated on attaining standards through emission controls, instead of fully addressing the prevention of air pollution and maintenance of air quality on a broad, regional level. In the early 1970s, the EPA disapproved all SIPs because many lacked effective mechanisms for maintaining federal standards. The EPA required states to identify areas that had air quality problems or where future growth rates would result in exceeding the NAAQS as “Air Quality Maintenance Areas” (AQMAs). The Medford-Ashland area was designated as an AQMA in 1974, encompassing the communities of Medford, Ashland, Central Point, Phoenix, Talent, White City, Eagle Point, and Jacksonville (228 square miles). The Oregon Department of Environmental Quality (DEQ) was given primary responsibility for enforcing air quality standards in Oregon.

An AQMA that does not meet the NAAQS for a particular pollutant is labeled a “non-attainment area” for that pollutant. Strategies for bringing the AQMA into compliance are required as a component of the SIP, as is a detailed analysis of the impact of projected future growth on air quality. Where the analysis indicates that an area may not maintain the NAAQS for the ten years after attainment, the state is required to submit an Air Quality Maintenance Plan.

An AQMA that does not meet the NAAQS for a particular pollutant is labeled a “non-attainment area” for that pollutant. **Figure 2** illustrates the steps in developing a SIP in a non-attainment area under the *Clean Air Act*. Strategies for bringing the AQMA into compliance are required as a component of the SIP, as is a detailed analysis of the impact of projected future growth on air quality. Where the analysis indicates that an area may not maintain the NAAQS for the ten years after attainment, the state is required to submit an Air Quality Maintenance Plan.

### AIR QUALITY MAINTENANCE AREA STATUS

The Medford UGB was established as the non-attainment boundary for carbon monoxide (CO) in 1978, and, in 1987, the Medford-Ashland AQMA was designated as the non-attainment boundary for particulate matter (PM<sub>10</sub>). As required by federal law, SIPs were prepared for these two pollutants that exceeded the NAAQS in the Medford-Ashland AQMA.

#### **Carbon Monoxide (CO)**

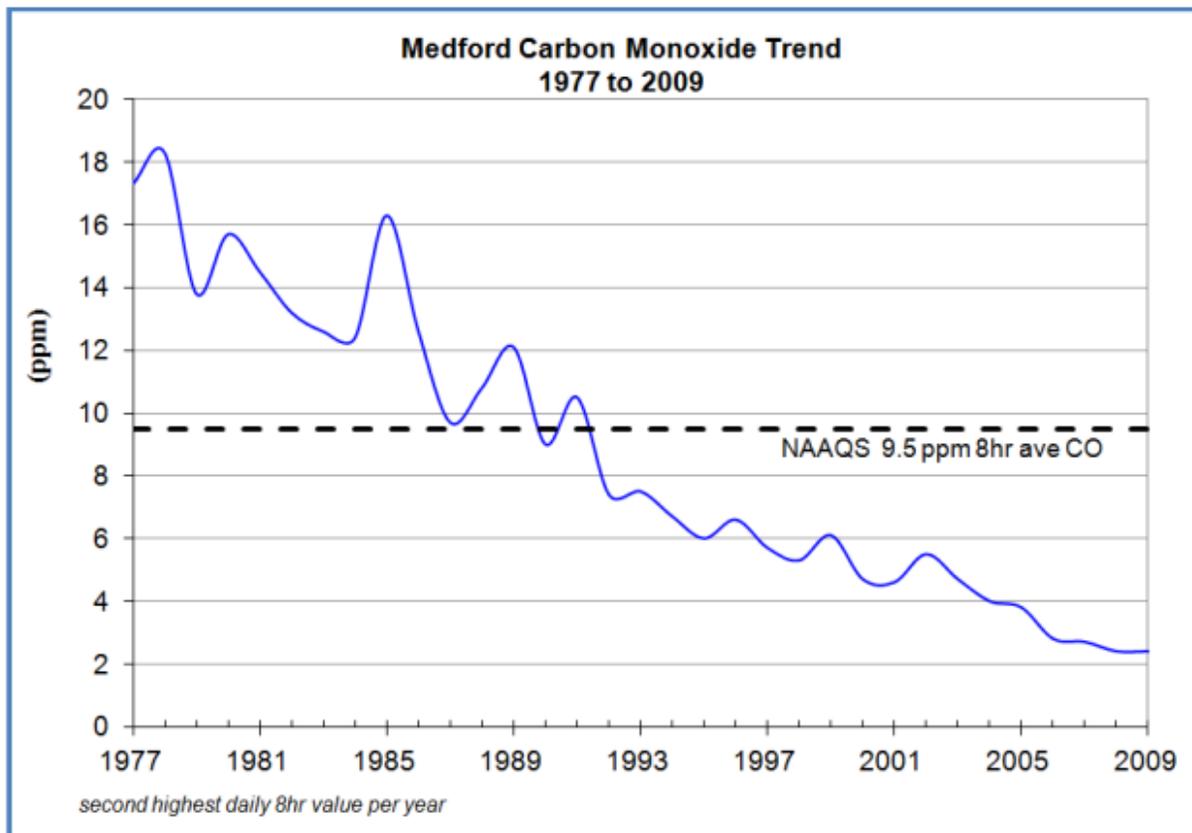
Carbon monoxide is a colorless, odorless gas that decreases the oxygen carrying capacity of the blood. High concentrations can severely impair the function of oxygen-dependent tissues, including the brain, heart, and muscle. Prolonged exposure to even low levels can aggravate

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existing conditions in people with heart disease or circulatory disorders. High levels of CO have traditionally been caused by emissions from motor vehicles.

Largely due to improvements in modern vehicle emission control systems, CO levels have progressively improved in the years since the designation of the Medford-Ashland AQMA, and Medford has not violated the CO standard since 1991. In 2001 the State of Oregon submitted a ten-year CO Maintenance Plan to EPA and requested that Medford be re-designated to attainment. EPA approved the request as a revision to the SIP of September 23, 2002, and a second ten-year CO Maintenance Plan has been prepared by DEQ indicating how Medford will continue to maintain the CO standard through September 23, 2022. **Figure 2** depicts the trend in carbon monoxide levels in Medford between the years 1977 and 2009. The majority (72%) of the CO air emissions in the Medford UGB can be attributed to motor vehicles, residential wood combustion, and prescribed burning.

**Figure 2**  
**Medford Carbon Monoxide Trend 2<sup>nd</sup> highest 8-hour average, 1977-2009**



Source: *Medford Carbon Monoxide Limited Maintenance Plan, December 2015, Oregon Department of Environmental Quality*

The CO Maintenance Plan relies on the following control measures for continued attainment of the NAAQS:

- Federal motor vehicle emission standards for new motor vehicles
- Use of Best Available Control Technology (BACT) for new or expanding major industry
- Oregon Vehicle Inspection Program (i.e. emissions testing and inspection) for vehicles up

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to 20 years old

- Emission certification for new wood stoves, wood stove change-out programs, and a voluntary curtailment program to reduce wood burning during stagnant weather periods.

### **Particulate Matter (PM<sub>10</sub>)**

There have been several PM<sub>10</sub> plans developed for the Medford-Ashland AQMA. The initial Attainment Plan adopted in 1991 contained a suite of emission reduction strategies that brought the area into compliance with PM<sub>10</sub> standards by the required Clear Air Act deadline of December 31, 1994. The PM<sub>10</sub> Attainment Plan was updated in 1998 and 2004, and the Medford-Ashland AQMA was re-designated to attainment by the EPA in 2006. The 2004 Plan included a PM<sub>10</sub> Maintenance Plan for the AQMA, the objective of which is to continue the successful PM<sub>10</sub> strategies for the AQMA in order to ensure continued compliance with PM<sub>10</sub> standards. The emission control measures contained in the SIP for PM<sub>10</sub> in the Medford-Ashland Air Quality Maintenance Area are:

- A mandatory woodstove curtailment program.
- Emission limit standards for existing industrial processes.
- Enhanced road cleaning program in Medford and White City.
- Management of prescribed forestry burning year round, and special protection for the Rogue Valley during the winter months.

The plan also continues the strictest requirements for managing emissions growth from future new and expanding major industry under the New Source Review (NSR) program. These include:

- A very low emission threshold level (5 tons/year) for triggering NSR.
- The requirements to install state-of-the-art emission control technology.
- The requirement to obtain emission offsets and demonstrate an air quality benefit (20% improvement in air quality).

### **NATIONAL AMBIENT AIR QUALITY STANDARDS**

Air pollution reduction efforts have succeeded in reducing emissions in the Medford-Ashland AQMA due to increased public awareness and proactive programs, but the potential to revert to previous conditions still exists. The topography of the Rogue Valley, the abundance of motor vehicles, and the continued growth in population in the region are all factors that contribute to the potential for poor air quality.

Federal air quality standards were developed to address health, safety, and welfare concerns. The NAAQS are divided into two levels, “primary” and “secondary.” *Primary* standards are designed to protect the public health with a built-in margin of safety. *Secondary* air quality standards, which are more stringent than primary standards, are designed to protect the public welfare from adverse effects, such as injury to crops and livestock, decreased visibility, deterioration of materials and property, and other types of environmental damage. Oregon’s air pollution control strategies are directed to meet the more stringent *secondary* air quality standards. Where the secondary standard is identical to the primary standard, the primary standard is also protective of public welfare. **Figure 3** displays the ambient air quality standards currently in effect in Oregon.

**Figure 3  
State and National Ambient Air Quality Standards**

<b>Pollutant</b>	<b>Averaging Time</b>	<b>National Ambient Air Quality Standard (NAAQS) Violation Determination</b>	<b>Primary NAAQS Exceedance Level</b>	<b>Secondary NAAQS Exceedance Level</b>
Carbon monoxide	1-hour	Not to be exceeded more than once/year.	35 ppm	-
	8-hour	Not to be exceeded more than once/year.	9 ppm	-
Lead	Three Months	Rolling 3 Month Average	0.15 µg/m <sup>3</sup>	0.15 µg/m <sup>3</sup>
Nitrogen dioxide	Annual	Annual arithmetic mean	53 ppb	53 ppb
	1-hour	3yr average of the maximum daily 98 <sup>th</sup> percentile one hour average.	100 ppb	-
Ozone	8-hour	3-year average of the annual 4th highest daily maximum 8-hour average.	0.070 ppm	0.070 ppm
PM <sub>2.5</sub>	24-hour	3-year average of the 24 hour average daily 98 <sup>th</sup> percentile.	35 µg/m <sup>3</sup>	35 µg/m <sup>3</sup>
	Annual Average	3-year average of the annual arithmetic mean	12 µg/m <sup>3</sup>	12 µg/m <sup>3</sup>
PM <sub>10</sub>	24-hour	Not to be exceeded more than once per year on average over 3 years.	150 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>
Sulfur dioxide	1-hour	3yr average of the maximum daily 99 <sup>th</sup> percentile one hour average.	75 ppb	-
	3-hour	Not to be exceeded more than once per year.	-	0.5 ppm

**Notes:** µg/m<sup>3</sup> = micrograms of pollutant per cubic meter of air  
 ppm = parts per million  
 ppb = parts per billion

While there are NAAQS for seven pollutants, there are currently three pollutants of significant concern for Medford: ozone, particulate matter (PM<sub>2.5</sub>), and air toxics. At present, the DEQ does not have any air toxics monitors in SW Oregon.

**Ozone (O<sub>3</sub>)**

Ozone is part of the ozone layer in the earth’s stratosphere. Ozone is harmful outside of the ozone layer in the lower atmosphere, and at that point it is often referred to as smog, ground level ozone, or ozone pollution. Ozone typically forms on days when the temperature is warm and stable, typical conditions during the summer in Medford. Ground level ozone is not emitted directly into the air, but is created by chemical reactions between oxides of nitrogen (NO<sub>x</sub>) and volatile organic compounds (VOC) in the presence of sunlight. Emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are some of the major sources of NO<sub>x</sub> and VOC. Breathing ozone can trigger a variety of health problems, particularly for children, the elderly, and people of all ages who have lung diseases such as asthma. Ground level ozone can also have harmful effects on sensitive vegetation and ecosystems. While ozone levels have declined in Medford since 2007, a slight uptick was measured in the 2013-2015 timeframe.

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### **Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>)**

The *Clean Air Act* requires the EPA to review and revise air quality standards to ensure that citizens are protected from the harmful effects of air pollution. “Particulate matter” comes mostly from smoke, dust, and vehicle exhaust. In 1987, standards were established by the EPA for particulate matter particles that are 10 microns or less in diameter (PM<sub>10</sub>). A comprehensive review of the human health effects of PM<sub>10</sub> revealed that the standards were not sufficient to protect human health. Health studies show harmful effects from breathing particles as small as 2.5 microns in diameter (PM<sub>2.5</sub>). This smaller particle is inhaled deeper into the lungs and can potentially cause more damage than larger particles. Standards for PM<sub>2.5</sub> were established in 1997 for 24 hour and annual levels, and in 2006 the PM<sub>2.5</sub> levels for daily average levels were significantly reduced from 65ug/m<sup>3</sup> to 35ug/m<sup>3</sup>. Medford trends close to the PM<sub>2.5</sub> standard in both daily and annual average levels.

### **Air Toxics**

There are 188 air toxics, about 50 of concern, in Oregon. DEQ has monitored for air toxics in Medford in the past, but this monitoring was only temporary and is moved around the state. According to DEQ, air toxics include diesel soot, benzene, polycyclic aromatic hydrocarbons (tar-like by-products from auto exhaust and other sources), and metals including manganese, nickel and lead. Air toxics come from a variety of sources including cars and trucks, all types of burning (including fireplaces and wood stoves), businesses, and consumer products. Air toxics are air pollutants known or suspected to cause cancer or other serious health problems. National and state studies indicate that Oregonians are exposed to a number of air toxics at potentially harmful levels.

## **NATURAL RESOURCES - AIR QUALITY – CONCLUSIONS**

1. Medford’s location in the Rogue Valley below substantial mountain ranges (the Cascades, the Siskiyou, and the Coast Range) increases the difficulty of maintaining federal air quality standards. Medford’s climate is influenced by atmospheric inversion layers in the fall and winter months which trap air emissions in the valley.
2. The City of Medford has little influence on the air pollution emissions caused by travelers and freight shippers traveling through the planning area on state highways such as Interstate 5.
3. Largely due to improvements in modern vehicle emission control systems, carbon monoxide (CO) level progressively improved in the years since the designation of the Medford-Ashland AQMA, and Medford has not violated the federal CO standard since 1991. As a result, Medford was re-designated an “attainment” area for CO in 2002. Similarly, Medford has been in compliance with federal particulate matter (PM<sub>10</sub>) standards since 1994, and was re-designated an “attainment” area for PM<sub>10</sub> in 2006. Maintenance plans for the AQMA have been approved by the EPA to help ensure continued compliance with the federal standards for these two pollutants.
4. While Medford’s air quality has improved due to proactive Air Quality Maintenance Area (AQMA) programs and increased public awareness, particularly relating to wood smoke, the potential to revert to previous poor air quality conditions exists. The Rogue Valley’s topography, its many motor vehicles, and continued population growth have the

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potential to further degrade Medford's air quality in the future.

5. Pollutants of concern in the Medford-Ashland AQMA are particulate matter (PM<sub>2.5</sub>), ozone, and air toxics (although the DEQ does not presently have any air toxics monitors in SW Oregon). While ozone levels have declined in Medford since 2007, there was a slight uptick measured in the 2013-2015 timeframe. Medford trends close to the PM<sub>2.5</sub> standards in both daily and annual average levels.

### NATURAL RESOURCES - AIR QUALITY GOALS, POLICIES, AND IMPLEMENTATION MEASURES

**Goal 3:** *To enhance the livability of Medford by achieving and maintaining compliance with National Ambient Air Quality Standards (NAAQS).*

**Policy 3-A:** The City of Medford shall continue to provide leadership in developing, adopting, and implementing regional air quality improvement strategies to maintain compliance with the National Ambient Air Quality Standards (NAAQS).

**Implementation 3-A (1):** Continue to participate, along with state and local agencies involved in air quality attainment, in the preparation and implementation of the applicable *Air Quality Management Plans* (AQMP's) and *State Implementation Plans* (SIP's) for the Medford-Ashland Air Quality Maintenance Area (AQMA).

**Implementation 3-A (2):** Continue to participate, along with Jackson County and other affected agencies, in administering air quality public education and smoke reduction programs.

**Implementation 3-A (3):** Implement strategies from sources such as the *Medford Transportation System Plan*, the *State Implementation Plans* (SIPs) and the *Oregon Transportation Planning Rule* (TPR) that reduce emissions or improve air quality, such as increasing the use of alternative modes of transportation and use of alternative motor vehicle fuels, such as compressed natural gas and electricity, and propose amendments to the *Medford Land Development Code* for consideration by the City Council where necessary to assure compliance with such plans or rules.

See also the policies of the *Medford Transportation System Plan*, and Policy 9 of the "Urbanization Element."

**Policy 3-B:** The City of Medford shall continue to require a well-connected circulation system and promote other techniques that foster alternative modes of transportation, such as pedestrian-oriented mixed-use development and a linked bicycle transportation system.

See also Goal 1 of the *Southeast Plan* section of the "General Land Use Plan Element."

**Implementation 3-B (1):** Promote the use of incentives by Medford's larger employers to induce employees to use alternative modes of transportation or work

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at home in an effort to reduce motor vehicle emissions.

### WATER QUALITY

#### FEDERAL AND STATE REGULATIONS

Oregon's Department of Environmental Quality (DEQ) has primary responsibility for managing water quality in the state, operating under federal and state statutes, rules, and standards. Generally, DEQ implements its water quality program through the issuance of permits for discharge into the *waters of the state*. Permits are issued if an applicant can show consistency with federal rules, and state and river basin water quality management plans. Statutory language governing water quality in Oregon is found primarily in ORS Chapter 468 and OAR 340-41-001.

Forestry, agriculture, and urbanization have negatively affected Oregon's water quality. Under the federal *Water Pollution Control Act of 1972*, each state is required to address farm and forestry-related nonpoint sources of surface water pollution, such as sedimentation, stream clogging debris, nitrogen from fertilizers and slash burning, and herbicides and insecticides.<sup>8</sup> Guidelines and best management practices for controlling water pollution from forestry are provided in the *Oregon Forest Practices Act* which is enforced by the Oregon Department of Forestry. While there are no forest lands within the Medford UGB, the surrounding forest lands affect the quality of the surface water in the valley below.

The effects of urbanization on stormwater runoff are addressed by the federal *National Pollutant Discharge Elimination System* (NPDES) program, which has implications for the City of Medford. Under the *Clean Water Act*, the federal Environmental Protection Agency (EPA) established NPDES Phase I stormwater discharge standards for municipalities with populations of 100,000 or more. The NPDES requirements included a prohibition on non-stormwater discharges and a reduction in polluted stormwater discharges to the maximum extent possible. New rules established in 1999, known as NPDES Phase II, affect cities smaller than 100,000 persons, such as Medford. This permit program is intended to provide flexibility for cities. The Phase II program must include:

- Public education and outreach
- Public involvement and participation
- Illicit discharge detection and elimination
- Construction site storm water runoff control
- Post-construction storm water management
- Pollution prevention for municipal operations

In addition, operators of construction sites that disturb more than one acre will be required to obtain NPDES permits. They will be required to filter sediment caused by erosion through methods such as filter fencing, inlet protections, and temporary mulching and seeding. Medford will have until 2003 to develop programs and regulations to comply with the new rules.

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<sup>8</sup>*Jackson County Comprehensive Plan*, Jackson County Planning Department, 1989.

## GROUNDWATER

Historically, the main consideration given to groundwater in land use planning was to assure adequate water supplies. Since groundwater is an important source of water for many residential, industrial, and agricultural uses, recent concerns involve the increasing incidences of pollution and contamination. Medford is fortunate to have a substantial supply of domestic water from the Big Butte Springs, with the Rogue River as a secondary source, and, subsequently, does not use the groundwater beneath the city for domestic use. However, there are many households in the unincorporated areas in and near the UGB that depend on domestic wells. It is therefore important that the City of Medford strive to maintain the quality of the groundwater resource that lies beneath the UGB.

Groundwater is contained in aquifers, underground geologic formations made up of permeable rock material. Aquifers function like natural underground storage reservoirs, constantly adapting to surface and groundwater withdrawals, infiltration, and recharge. Ground water occupies complex three-dimensional spaces that operate with fluctuating levels. It percolates into different zones of saturation, which occur at varying depths within the same aquifer or geologic formation. Groundwater becomes recharged or replenished by infiltration of rain, snowmelt, and surface water, or by underground seepage from streams, lakes, or rivers. Unlike surface water that is visible, and its quality easily monitored, groundwater quality is far more elusive. Substances and materials at the surface or just below it can reduce the quality of an underlying aquifer through infiltration. Infiltrating water can dissolve and transport contaminants to the aquifer.

Certain land uses have the greatest potential for contaminating ground water:

- Industrial facilities, including manufacturing, fuel and chemical storage facilities, railroad yards; urban complexes, including highway systems, landfills, utility lines, and sewage treatment plants; and automotive repair facilities
- Agricultural operations, including crop cultivation, feedlots, chemical storage facilities, and processing plants

Other activities, such as grading, construction, use of motor vehicles and equipment, use of

**Figure 5**  
**Primary Contributors to the**  
**Contamination of Ground Water**

**Landfills:** Buried wastes discharge leachate, the composition of which varies with the composition of the landfill. Leachate can be heavy in organic compounds, such as methane and benzene, or in trace elements and other contaminants from industrial waste.

**Agriculture:** Fertilizers and pesticides, composed principally of nitrogen and phosphorus, are carried through the soil to aquifers, and pose serious health problems when found in water supplies.

**Urban Stormwater:** Runoff from developed areas, especially streets, parking lots, and industrial and residential surfaces, often contains a wide variety of contaminants. Most stormwater is discharged into streams, but a significant amount goes directly into the soil. This source of ground water contamination should be regarded as a potentially important one in Medford.

**Drain Fields:** Nitrogen, sodium, and chlorinated organic compounds from household or community sewage effluent can be discharged into ground water through septic tank drain fields.

**Mining:** Mineral extraction and related operations discharge a variety of contaminants into both surface and ground water.

**Spills and Leakage:** Underground leakage and spills of petroleum products, various organic compounds, fertilizers, metals, and acids are potential hazards from commercial and industrial uses.

Source: *Landscape Planning: Environmental Applications*

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pesticides and herbicides, sewer system leakage, etc. must also be regulated to protect groundwater. **Figure 5** discusses the primary contributors to the contamination of groundwater. The low base flows of local streams reflect a lack of large producing aquifers in the region. The primary aquifer present in the Bear Creek Valley is south of Medford, toward Talent and Ashland, located in the alluvial deposits found on the valley floor. This aquifer is recharged by precipitation that infiltrates the land surface. Other aquifers are found in the northern portion of the valley, in the North Medford/Agate Desert area, and along the southwest margin of the valley, in the Hornbrook geologic formation.

Medford, located on alluvium rock underlain with recent deposits of sand, gravel, clay, and bedrock, has a shallow water-bearing zone, averaging less than 50 feet. Generally, the more shallow the aquifer the greater the risk of contamination of the groundwater supply. Groundwater in the Bear Creek Valley generally flows in a northerly direction, and, consequently, there is a risk of contamination of sources north of Medford, where residents rely on private wells. Rural development served by private wells poses additional problems, including lowering the water table in the region. As noted in the report, *Bear Creek Valley 2050 Water Supply Plan, Phase I*, there are more than 26,000 wells in Jackson County, serving between 40,000 and 50,000 people. Nearly all of these wells provide water for domestic needs, with few used for agricultural irrigation.

Groundwater resources are addressed by *Statewide Planning Goal 5*, which requires protection of *critical groundwater areas* and *ground water-limited areas*, as designated by the Oregon Water Resources Commission. In addition, the watershed for Medford's Big Butte Springs, which produce approximately 26.4 million gallons per day (MGD), is identified as a state-certified *Drinking Water Protection Area* by the Oregon Health Department.<sup>9</sup> For service areas with populations greater than 10,000, such as the Medford Water Commission's, a Drinking Water Protection Area is considered a significant Goal 5 resource. The Big Butte Springs, through the Medford Water Commission, provide domestic water for several communities, including Medford, Central Point, and Jacksonville.

The Big Butte Springs Drinking Water Protection Area is the land surface that overlies the recharge area for the springs plus the underlying aquifer. The watershed contains 56,000 acres located in Jackson County approximately 30 miles northeast of Medford, seven miles east of Butte Falls on the westerly slopes of Mount McLoughlin. It is primarily under federal ownership, with smaller portions owned by the Medford Water Commission and private timber companies. Although outside the Medford UGB, the Medford Water Commission and the City of Medford participate with Jackson County in protecting this significant resource. The Water Commission is developing a watershed management program and protection strategy to safeguard water quality, based on an inventory of potential contaminant sources and an analysis that determined susceptibility to those contaminants.

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<sup>9</sup>The state-certified *Drinking Water Protection Area Program* was previously known as the *Wellhead Protection Program*.

### SURFACE WATER POLLUTION

Planning for environmental quality in Medford is a regional issue, and any thorough plan for improving surface water quality must involve other communities. Many communities in the region use surface water as a domestic water source. The Rogue River is a source for communities such as Shady Cove, Gold Hill, Rogue River, and Grants Pass. The Medford Water Commission uses Rogue River water as a secondary source of domestic water through the Duff Water Treatment Plant located just upstream of Medford's Regional Water Reclamation Facility. This source is primarily utilized during the drier summer months.

Sources of surface water pollution are identified as either *point* or *nonpoint* sources. *Point* sources are characterized by a concentrated outfall such as treated municipal sewage or industrial process water. *Nonpoint* sources are diffused sources of water pollution that emanate from large areas, and enter streams via stormwater, precipitation, inter-system seepage, air pollution, or agricultural runoff. The City of Medford operates the Regional Water Reclamation Facility (sewage treatment plant) which discharges reclaimed wastewater (a *point* source) into the Rogue River from its facility near Table Rock Road. It is located downstream of the Duff Water Treatment Plant. In addition to the City of Medford, the RWRf serves a number of other cities and unincorporated areas, from Jacksonville to Eagle Point. The facility treated an average daily dry weather flow in 1997 of 16.7 million gallons per day (MGD). Some wastewater is reused for on-site landscape irrigation and for a pilot agricultural reuse project, which grows Poplar trees and plants for pulp fiber and lumber. The facility has conducted a DEQ-approved Industrial Waste Pretreatment Program since 1983. Sixteen significant industrial users discharge to the facility, eight of which have specific federal requirements as "categorical" industrial users. The facility also has had a DEQ-approved Biosolids (sludge) Management Plan and program since 1988, conducted according to federal and state regulations, including the NPDES. The biosolids are "beneficially used" through application on local farmland as crop nutrients.

The magnitude of nonpoint pollution is more severe than scientists originally estimated, due to the size of the source areas, the many outfalls involved, and the sporadic nature of the flows. Consequently, nonpoint pollution does not lend itself to abatement using treatment or other conventional methods. Instead, nonpoint pollution abatement must be approached as an environmental management issue, focusing on the activities and conditions that produce the pollutants, and integrating long range planning strategies to develop solutions. The Oregon DEQ and DLCd have produced a guide entitled *Nonpoint Source Pollution Control Guidebook for Local Government*, June 1994, which provides an introduction to nonpoint pollution in a format designed for local planners, engineers, elected officials, citizens, etc.

One of the most serious impacts of urban development is the increase in the rate and amount of surface water runoff reaching streams and rivers.<sup>10</sup> As noted in the 1996 *Comprehensive Medford Area Drainage Master Plan, Volume II, Technical and Stormwater Management Appendices*, urban development, with its considerable impervious surfaces, modifies the natural runoff characteristics of a drainage system. Typically, peak flow, total flow, and flow velocity increases, resulting in less time to filter the runoff, and, therefore, reducing water quality.

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<sup>10</sup>*Landscape Planning: Environmental Applications*, 2nd Edition, William M. Marsh, 1991.

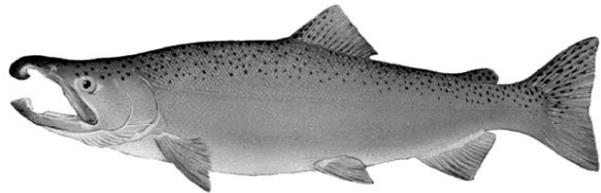
## ENVIRONMENTAL ELEMENT

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Untreated urban runoff contains pollution that subsequently flows into larger water bodies, continuing to pollute water downstream.

Currently, Bear Creek and its tributaries in Medford (Larson, Lone Pine, Lazy, and Crooked Creeks) are considered *water quality limited* streams by the DEQ.<sup>11</sup> This designation is given to waters (primarily streams) in Oregon that do not meet established water quality standards, indicating a need for increased treatment of discharges.<sup>12</sup> Additionally, the temperature of Bear Creek at certain times of the year is too warm to meet requirements. One of the most significant sources of pollution in Bear Creek is the City of Ashland's municipal wastewater discharge.<sup>13</sup> In 1988, waterways upstream of the Medford UGB were studied by DEQ to assess water quality and the sources of nonpoint pollution (*Oregon Statewide Assessment of Nonpoint Sources of Water Pollution*). Waterways within the Bear Creek watershed considered *severely impaired* included portions of Wagner and Griffin Creeks. *Moderately impaired* waterways included Myer Creek, upper Wagner Creek, Coleman Creek, upper Griffin Creek, Willow Creek, Neil Creek, and the lower portion of Emigrant Creek.<sup>14</sup> Ashland Creek, a tributary of Bear Creek, is also considered *water quality limited*, because of ammonia and carbonaceous oxygen demand.

Since Bear Creek is a water quality limited stream, a *total daily maximum load* (TMDL) strategy has been developed to bring the Bear Creek basin into compliance with federal standards. The City of Medford is among the local agencies (designated management agencies - DMA's) contributing to the nonpoint source pollution of the Bear Creek basin. The Rogue Valley Council of Governments (RVCOG), through the Bear Creek Watershed Council, is facilitating the work of the DMA's to develop and implement a strategy to bring the basin into compliance with water quality standards. Groups such as the Bear Creek Watershed Education Partners and the Bear Creek Greenway Foundation are involving the public, including schools, in watershed education and cleanup programs to improve the quality of the region's waterways while educating the public about natural resources.



### GOAL 5 AND THE OREGON PLAN

*Statewide Planning Goal 5* provides another framework for improving water quality. Under the 1996 revisions to the OAR's that implement Goal 5, local governments are required to protect riparian corridors<sup>15</sup> and locally significant wetlands (defined later in the Wetlands section under

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<sup>11</sup>Bear Creek violates standards for dissolved oxygen, fecal coliform, and phosphorus from its mouth through river mile 24, and violates standards for pH from its mouth through river mile 14.2.

<sup>12</sup>*Local Wetlands Inventory and Oregon Freshwater Assessment Method Analysis, City of Medford*, Brown and Caldwell and Woodward-Clyde Consultants, October 1995.

<sup>13</sup>*Comprehensive Medford Area Drainage Master Plan, Volume II*, Brown and Caldwell, September 1996.

<sup>14</sup>*Local Wetlands Inventory and Oregon Freshwater Assessment Method Analysis, City of Medford*, Brown and Caldwell and Woodward-Clyde Consultants, October 1995.

<sup>15</sup>A riparian corridor is a Goal 5 resource that includes the water area, fish habitat, adjacent riparian areas, and wetlands within the riparian area boundary. "Fish habitat" is those areas upon which certain fish depend to meet their requirements for spawning, rearing, food supply, and migration. "Riparian area" is the area adjacent to a river, lake, or stream of transition from an aquatic to a terrestrial ecosystem. Goal 5 states that, for waterways with an average annual flow of less than 1000 cubic feet per second (cfs), the setback requirement is 50 feet from top-of-bank, and, greater than 1000 cfs, the setback requirement is 75 feet from top-of-bank.

## ENVIRONMENTAL ELEMENT

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*Determination of Significance*) by adopting the requirements of a *safe harbor*, which prescribes certain protection standards, or by proceeding with an “ESEE” process. A safe harbor imposes certain development standards that ensure compliance with Goal 5 by a local jurisdiction, and does not require elaborate studies by the jurisdiction to justify the standards. It also reduces the risk or impact of litigation by involving the state. The ESEE process requires an in-depth analysis of the *economic, social, environmental, and energy* consequences of allowing, prohibiting, or limiting uses that conflict with each resource. The safe harbor for riparian corridors includes a structural setback requirement measured from the top of the bank along certain waterways, and a limitation on vegetation removal. The safe harbor for locally significant wetlands includes restrictions on grading, excavation, fill, and vegetation removal within the wetland area.

The changes in the Goal 5 rules aid in implementing salmon recovery measures on a local level and complement the provisions of the *Oregon Plan for Salmon and Watershed Restoration*. The Oregon Plan is the official local-state-federal program for restoring salmon and steelhead populations in Oregon’s streams. Southern Oregon and Northern California are considered as having an “evolutionarily significant unit” of coho salmon, which were listed as *threatened* under the Endangered Species Act in 1997. Chinook salmon and steelhead have also been proposed for listing. The *Oregon Plan* was adopted by the 1997 Oregon legislature, and addresses both water quality and endangered species issues. Much of it focuses on local responsibility for the salmon recovery effort in order to retain state authority over management of Oregon’s natural resources. As Medford implements the new Goal 5 rules, the water quality of Bear Creek and its tributaries will continue to improve, as will fish habitat.

## STORM DRAINAGE

The use, management, and perception of open channel storm drainage systems within the urban environment changed considerably in the 1990s. Current views of stormwater planning, as noted in the *Drainage Master Plan*, advocate open systems that use mostly unaltered natural drainageways for conveying stormwater runoff, which can increase the potential for fish and wildlife habitat preservation. In addition, the vegetation in natural drainageways can filter pollutants from runoff. The quantity of pollutants removed varies with the type of vegetation. For example, herbaceous wetland plants are more effective in filtering and absorbing pollutants than woody vegetation. Woody shrubs and trees are more effective in bank stabilization than herbaceous plants, and therefore, more effective at preventing erosion.<sup>16</sup>

Storm drainage system improvements recommended by the *Drainage Master Plan* are intended to reduce the risk and associated costs of flooding, while aiding in water quality improvement. The document specifies the advantages of an innovative storm drainage system: “*Specific water quality facilities are not directly identified other than design of the detention ponds to perform a dual role: Flood protection and water quality treatment. However, a number of water quality treatment opportunities exist. Sedimentation facilities, vegetated swales, sand and compost filters, treatment wetlands, etc., can be added to the storm drainage system to improve water quality. Recently, stream bank restoration projects have been identified as having a significant*

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<sup>16</sup>*Stormwater Related Natural Resources and Water Quality Discharges*, Draft Report, City of Eugene, Public Works Engineering Division, April 26, 1995.

## ENVIRONMENTAL ELEMENT

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*water quality benefit. The city should start considering these types of facilities to meet future water quality objectives.”*

Population density in a city or region affects the *per capita loading rate*, defined as the amount of stormwater pollution produced per person. The per capita loading rate proportionately decreases with higher residential densities. Large residential lots of one to two acres in size tend to be more damaging to water quality. This is because they typically have larger houses, more motor vehicles, and relatively large expanses of roads and drives, which increases the amount of water pollution on a per-person basis.<sup>17</sup>

Strategies to reduce and improve stormwater runoff should include preventive measures incorporated into site design. For example, impervious surface materials can be reduced, assigning priority to preservation of open space instead. Clustered development is one means of improving the ratio of impervious to permeable surface area, while incorporating natural features. Hillside areas are desirable for clustered development, to reduce the extensive grading and subsequent erosion that typically accompanies hillside development. Other examples of strategies to reduce impervious surface include the use of “Hollywood” driveways (those with two narrow strips of cement for vehicle wheels) in residential areas, and the use of structural setbacks along waterways. The use of on-site storm drainage detention basins is also an excellent means of improving stormwater quality.<sup>18</sup> For these reasons, Medford should promote clustered development that provides open spaces, and encourage on-site detention ponds, while continuing to discourage large lot development on the urban fringe.

*The Conclusions and Goals, Policies, and Implementation Measures for the Natural Resources - Water Quality section are listed below in conjunction with those for the Wetlands and Wildlife Habitat sections.*

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<sup>17</sup>*Landscape Planning: Environmental Applications*, 2nd Edition, William M. Marsh, 1991.

<sup>18</sup>*Landscape Planning: Environmental Applications*, 2nd Edition, William M. Marsh, 1991.

## ENVIRONMENTAL ELEMENT

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### WETLANDS

In the past, few standards regulated the planning, development, or preservation of wetlands in Oregon's urban areas. Further, variations from one locale to another across the state resulted in inconsistent policies for preservation or development. More recently, a renewed appreciation of wetlands has led to the development and enforcement of greater federal and state regulations to guide wetland planning in urban areas. There has been increased recognition of wetlands as:

- Important habitats necessary for the survival of many aquatic and terrestrial species
- Integral parts of the hydrologic system necessary for the maintenance of water supplies and water quality

### FEDERAL AND STATE REGULATIONS

The principal federal law that regulates activities in wetlands is *Section 404* of the *Clean Water Act*. Section 404 restricts the discharge of wastes, including fill material, into the *waters of the United States*, which are broadly defined as coastal waters, rivers, streams, estuaries, and wetlands. The U.S. Army Corps of Engineers is responsible for administering Section 404. Wetlands are defined as “*those areas that are inundated or saturated with surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.*”<sup>19</sup>

To be considered a *jurisdictional wetland*, or one regulated by *Clean Water Act* regulations, the wetland must contain wetland plants, hydric soils, and saturated or inundated substrate. Permits are required from the U.S. Army Corps of Engineers and the Oregon Department of State Lands (DSL) to fill or drain a jurisdictional wetland. If the activity cannot be justified, permits are not issued. If the activity is justified, the permits are likely to require *compensatory mitigation*, to replace the acreage and values of the wetland area lost.<sup>20</sup>



Planning efforts to satisfy federal and state wetland regulations are shifting to the local level. The Oregon Department of Land Conservation and Development (DLCD) has established the responsibilities that cities and counties have regarding wetlands under Goal 5. To comply with the wetlands requirements of Goal 5, local governments must conduct a Local Wetland Inventory (LWI) and adopt “safe harbor” or similar regulations that protect locally significant wetlands, and/or develop protections through an ESEE analysis process as described in the previous section.

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<sup>19</sup>*Comprehensive Medford Area Drainage Master Plan*, September 1996.

<sup>20</sup>*West Eugene Wetlands Plan*, City of Eugene and Lane Council of Governments, December 1992.

## ENVIRONMENTAL ELEMENT

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In 1995, the City of Medford completed its first “*Local Wetlands Inventory (LWI) and Oregon Fresh Water Wetland Assessment Method Analysis*,” which documented the presence, location and size of the wetlands in the UGB. The LWI and OFWAM analyses were updated and approved by DSL in 2002 (*Medford Local Wetland Inventory and Locally Significant Wetland Determinations*, 2002 by Wetland Consulting). See **Figure 6** for a general vicinity map of Medford area wetlands. The official LWI maps are available in the Medford Planning Department. A qualitative assessment of the wetlands was conducted according to the Oregon Freshwater Wetland Assessment Method (OFWAM)<sup>21</sup>. DSL is required to be notified of all applications for development activities, including applications for plan approvals, development permits, or building permits, and of development proposals by the City of Medford, that may affect any wetlands, streams, or waterways identified and/or mapped in the *Local Wetlands Inventory*.

The 2002 LWI inventoried and mapped 134 wetland sites in the UGB, and mapped, but did not inventory the waterways. The waterways were inventoried, mapped, and assessed in a separate process. See the *Medford Riparian Inventory and Assessment Bear Creek Tributaries*, 2002 by Wetland Consulting. There was a total of 293 acres of wetlands inventoried, including created ponds and natural wetlands. *Palustrine forested* and *scrub-shrub* wetland plant communities are common along stream corridors, typically confined to a narrow strip along steeply banked watercourses. Dominant tree species include black cottonwood, white alder, and Oregon ash. Understory shrubs include willow, choke cherry, wild rose, and snowberry. Himalayan blackberry vines, an invasive introduced species, often dominate understory areas, especially those that have been disturbed. The *palustrine emergent* wetlands are dominated by herbaceous plants such as cattails, rushes, sedges, and reed-canary grass in inundated areas, and teasel, tall fescue, buttercup, and velvet grass adjacent to the water.

Vernal pools, which are rare rain-fed seasonal wetlands, have been found in the Agate Desert area north of the Medford UGB and in the northern portion of the UGB in and near the Airport in areas having Agate-Winslo soils. The hard pan underlying the soil restricts infiltration, causing prolonged inundation. An inventory and assessment of the vernal pools in the Agate Desert area was completed by DSL in 1997. Most historic vernal pools located within the Medford UGB have been severely altered or obliterated due to grading and vegetation alterations, although some may still be identified as wetlands.

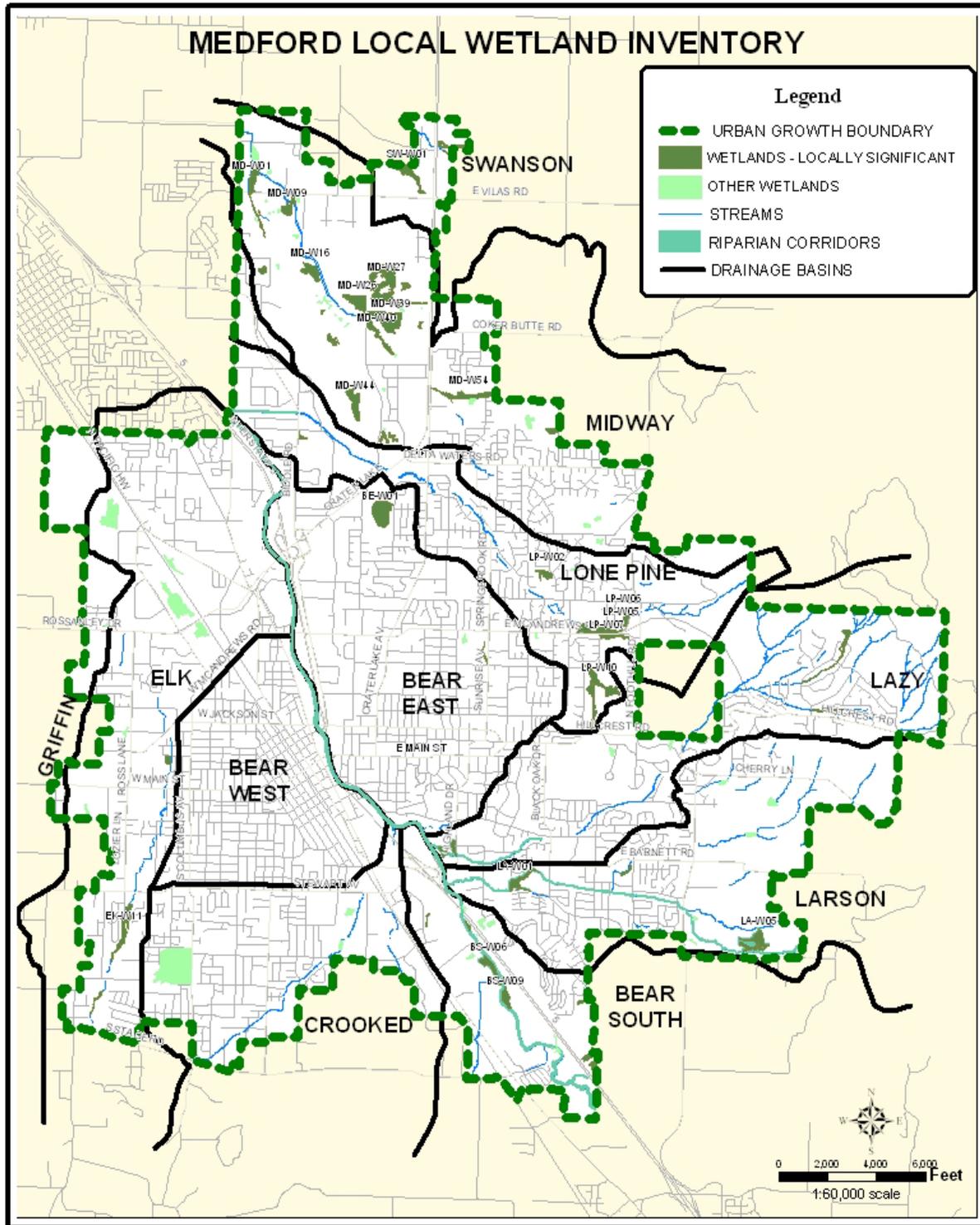
Some threatened or endangered plant species are known to occur in conjunction with vernal pools in Jackson County, including Cooks (Agate Desert) lomatium and large-flowered woolly meadowfoam. Both are listed as Endangered Species by the state of Oregon and Candidate Species under the federal *Endangered Species Act*. Agate Desert lomatium (*loamtium cookii*), which is known to occur only in Jackson and Josephine Counties, has been identified on the grounds of the Rogue Valley International-Medford Airport, which is within the UGB.<sup>22</sup> The RVCOG is managing a cooperative effort, the Agate Desert Vernal Pools Project, initiated to develop a wetland conservation plan for the Agate Desert vernal pool area. Jackson County, the City of Medford, the Nature Conservancy, DSL, ODFW, the U.S. Army Corps, and the U.S. EPA are among the participating agencies.

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<sup>21</sup>Statewide methodology used in the *Local Wetlands Inventory* for assessing and determining the significance of the wetlands in Medford.

<sup>22</sup>*Draft Environmental Assessment, Rogue Valley International-Medford Airport, Proposed Improvements*, March 1999, David Evans and Associates, Inc.

Figure 6: Medford Area Wetlands



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The City of Medford owns property in the vicinity of the Water Reclamation Facility and Whetstone Creek, located outside the UGB near Antelope Road that contains vernal pools and other wetlands. Some of this land is potentially suitable as mitigation sites for wetland impacts caused by City infrastructure projects.

### **Determination of Local Significance**

The LWI/OFWAM is a “first layer” planning tool for identifying the most valuable wetlands in the Medford UGB. OFWAM assessments of the wetlands are used in making a determination of *significance* according to state standards (OAR 141-086-0350). In addition, other wetlands may be adopted by the City Council as *locally significant*. Using the OFWAM criteria, 45 of the inventoried wetlands in the Medford UGB were determined to be locally significant. . Nearly half are locally significant due to having a water quality function and being located within one-quarter mile of a “water quality limited stream”. Several significant wetlands have direct surface water connections to Bear Creek and Larson Creek, which are habitat for “indigenous anadromous salmonids”. See **Appendix C** for the inventory of locally significant wetlands.

### **Uses Conflicting with Wetland Protection**

Occasionally, the protection of a locally significant wetland may conflict with other important community goals. After a sound ESEE analysis, the City Council may make a finding that a particular “conflicting use” is more important to the long term needs of the citizens than preservation of the wetland area. The most common conflicting uses have been critical links in the City’s arterial and collector street system. In many cases, a street crossing can be accomplished without serious disruption of a wetland, such as along a riparian corridor. In other cases, fill and compensatory mitigation may be required if an alternative location is not available. The ESEE analysis will result in a determination that the identified conflicting use will be permitted, limited, or prohibited.

### **Wetland Mitigation**

Under current federal and state laws, any wetland losses must be compensated through creation of new wetlands, restoration of former wetlands, and/or enhancement of existing wetlands. Mitigation efforts not only satisfy federal and state laws, but attempt to achieve a balance between competing land uses. The 1995 LWI recommended that “*an active land acquisition plan and schedule are required to acquire key locations for future wetlands mitigation. Without such a plan, many potential sites may be permanently lost.*” A *Wetlands Mitigation Concept Plan* prepared for the City of Medford in 1996, presented methods for mitigating wetland losses. The 2002 LWI identified some potential mitigation sites within the UGB.

One means to achieve wetland preservation objectives is through the establishment of a regional wetland mitigation bank. Freshwater mitigation banking is addressed in the *Oregon Mitigation Bank Act of 1987*. Often, wetland loss compensation is conducted on a piecemeal basis as individual development projects are completed. As a result, many newly created wetlands are small, isolated, and of marginal value as wildlife habitat, a primary intent of wetland mitigation. In some circumstances, development is slowed by a lack of suitable wetland mitigation sites. As noted in the 2002 LWI, the most appropriate mitigation sites in the Medford UGB are those that are made up of dewatered hydric soils over five acres in size. They are often located near existing drainageways, including one in the undeveloped Southeast Medford area near Larson Creek, a primary tributary of Bear Creek, that could serve several functions, including water quality control and open space connections, possibly through the designation of conservation areas and greenways. The Bear Creek corridor is also being evaluated to determine if suitable

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mitigation sites are located along the waterway. Refer to the *Wetlands Mitigation Concept Plan* for a more detailed description of the suggested wetland mitigation strategies.

### **WETLAND FUNCTIONS IN AN URBAN ENVIRONMENT**

Wetlands in urban areas serve a variety of roles in achieving community needs and objectives, including the provision of educational and recreational opportunities. Locally significant wetlands are those that have been determined to serve one or more of the following functions: preservation/diversification of wildlife, maintenance of fish habitat, improvement of water quality, or hydrologic control.

The critical functions wetlands can provide within urban areas include, but are not limited to:

#### **Stormwater Management**

The use of open channels and wetlands in an integrated storm drainage system provides a better balance between stormwater conveyance and flood control needs, and environmental and community needs. The *Drainage Master Plan* recommends the development and implementation of a local wetlands management plan that incorporates flood control, water quality control, and principles of natural resource management. Such efforts, in the long term, will assist in reducing stormwater pollution, improving water quality, and creating pleasant urban open spaces and waterways.

#### **Water Quality Improvements**

Wetlands can contribute to the improvement of water quality. The vegetation in both natural and constructed wetlands functions as a biological filter in removing sediments, excessive nutrients, and other water pollutants from stormwater runoff resulting in cleaner surface water and improved aquatic habitat.

#### **Improved Flood Control**

Additional flood storage capacity can be gained by protecting existing wetlands, by creating new wetlands, and by widening and returning channels to their natural meandering patterns. Design conventions, such as widened channel bottoms, allow the resulting low flow channels to meander among wetlands, re-establishing the original stream bank habitat, and reducing the downstream impacts of stormwater runoff that originates in urban areas. Other flood storage improvements such as on-site detention ponds can provide multiple benefits, for example, provision of flood control, open space, and wildlife habitat.

#### **Improved Plant and Animal Habitat**

Greater protection of wildlife habitat is a priority of Goal 5, and wetland areas provide critical wildlife habitat. By protecting and restoring a variety of wetland types, and buffering them from the impacts of nearby development, diversity of habitats can be sustained and improved.

#### **Recreation, Education, and Research**

Trails, multi-use paths, and wildlife observation areas within a diverse system of wetlands and stream corridors can provide opportunities for public enjoyment of the natural environment. Wetland environments provide excellent opportunities for education and recreation, particularly if utilized by elementary and secondary schools. The completion of the Bear Creek Greenway from Ashland to Central Point and beyond is progressing, and encompasses many habitat types along Bear Creek, including wetlands. The Greenway is already used for educational purposes,

## **ENVIRONMENTAL ELEMENT**

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combining classroom learning with field experience in environmental programs, such as those where students adopt creek sections, plant trees, and release salmon fry. The Bear Creek Watershed Education Partners, a committee of the Bear Creek Watershed Council, is currently overseeing such programs.

### **Corridors and Connections**

By providing greenways and open space along existing waterways and wetlands, a connected system could be established throughout the UGB, and ultimately linking communities in the Bear Creek Valley. Greenways provide corridors for wildlife movement and species interchange, as well as connections for human use. One example is the riparian corridor and proposed multi-use path along Larson Creek, which would connect the Southeast area with the Bear Creek Greenway.

## **WETLAND PROTECTION ORDINANCE**

As noted above, to comply with Goal 5 requirements for wetland protection, specific regulations must be adopted in the Medford Municipal Code. Medford's proposed wetland protection regulations would address locally significant wetlands and other identified wetlands that are not locally significant. In the case of some wetlands, a "safe harbor regulation" may be adopted, which prohibits disturbance of the wetland, but does not include buffer areas. In other cases, after the ESEE (Energy, Social, Environmental, and Energy) analysis is completed, regulations that address allowing, prohibiting, or limiting conflicting uses would be adopted. These may include required buffers. When reviewing permits or land use applications for properties containing a wetland, the approving authority would consider how well the proposal satisfies the objectives of the regulations. The objectives of Medford's proposed wetland protection regulations include:

- To implement the goals and policies of the "Environmental Element" of the Medford *Comprehensive Plan* and achieve their purposes.
- To protect and restore Medford's wetland areas, thereby protecting and restoring the hydrologic, ecologic, and land conservation functions these areas provide for the community.
- To protect fish and wildlife habitat, enhance water quality, control erosion and sedimentation, preserve native vegetation, and reduce the effects of flooding.
- To protect and restore the natural beauty and distinctive character of Medford's wetlands as community assets.
- To enhance the value of properties near wetlands by utilizing the wetland as a visual amenity.
- To enhance coordination among local, state, and federal agencies regarding development activities near wetlands.
- To implement state and federal law with respect to protecting Medford's significant wetlands and the protection of clean water, pollution and flood control, and preservation

## ENVIRONMENTAL ELEMENT

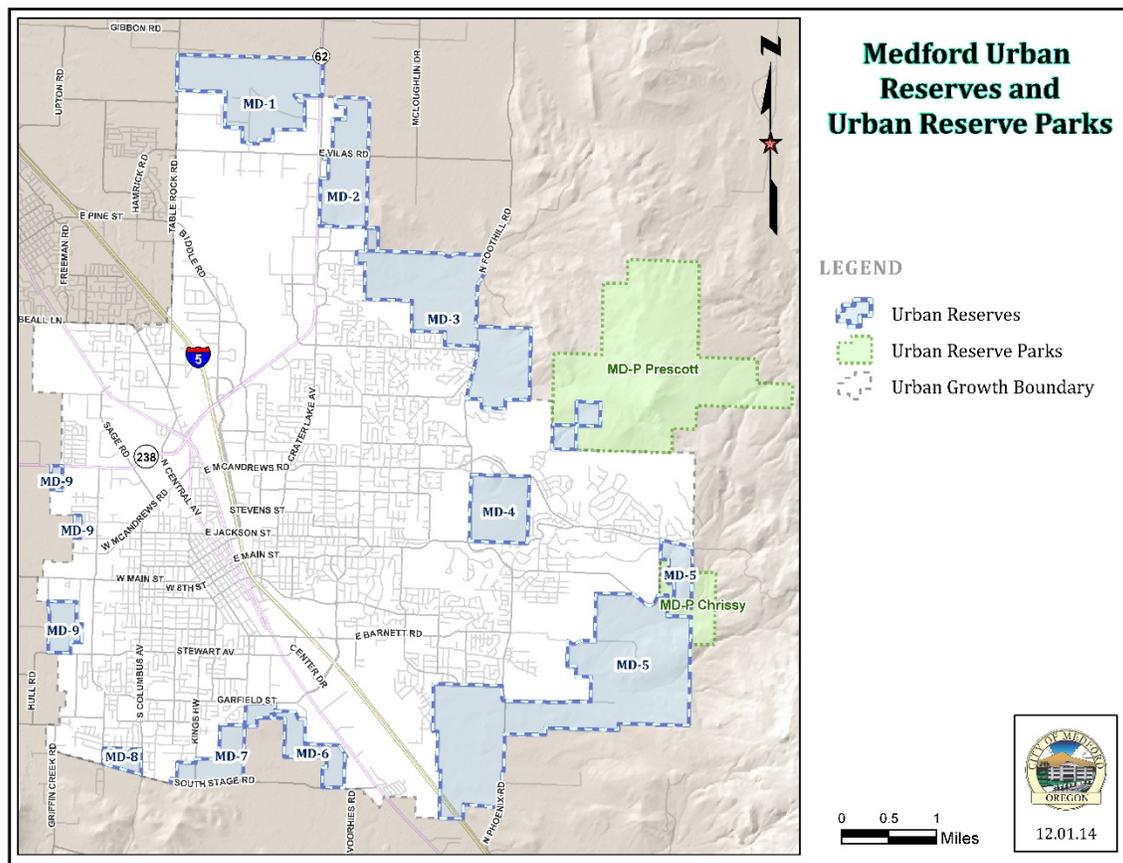
of endangered species.

- To improve public awareness and appreciation of wetlands for their unique ecological functions and the visual and environmental benefits they provide.

### URBAN RESERVE LOCAL WETLANDS INVENTORY (2016)

In 2015, the City of Medford hired SWCA Environmental Consultants to conduct a Local Wetlands Inventory (LWI) for the areas in the City's Urban Reserve (UR). This inventory was started to follow the external study area portion of the Urban Growth Boundary project and address Goal 5 requirements related to wetlands. The entire UR was studied to cover all possible areas considered for inclusion in the UGB. Each of the 11 UR areas is labeled with a "MD" number starting at 1 through 9 (See Figure 16). The study area encompassed roughly 6,400 acres including Prescott and Chrissy Parks within four identified drainage basins.

Figure 16: Study Area - Medford Urban Reserves and Urban Reserve Parks



The consultants followed the approach outlined in the Oregon Administrative Rules (OAR) using a combination of on-site and off-site inventory methods to identify the resources. Wetlands were evaluated using the *Oregon Freshwater Wetland Assessment Methodology (OFWAM)* and grouped into units. These results were in turn used to identify Locally Significant Wetlands (LSW) within the study area. The report identifies 85 wetlands (58 identified as locally significant) totaling 195 acres (not including rivers, streams, or artificially created waters). The list and maps of the 58 Locally Significant Wetlands are provided below for each applicable MD

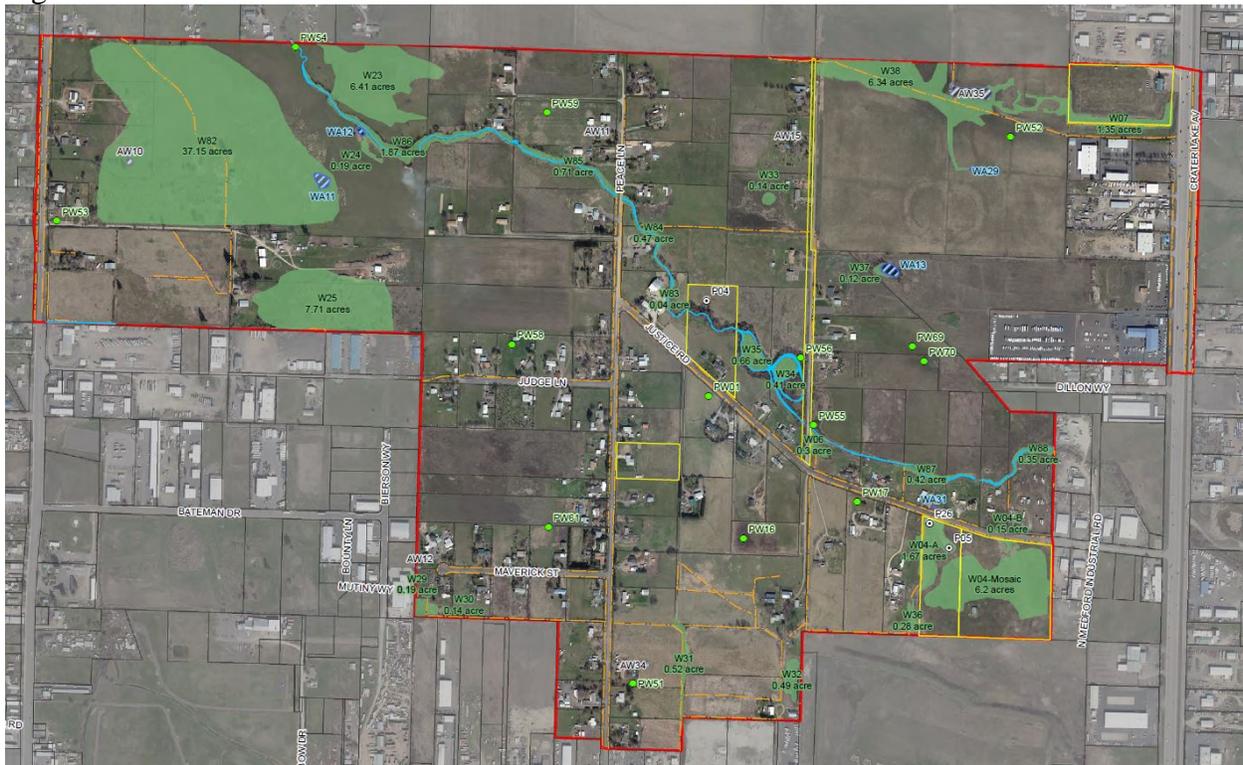
## ENVIRONMENTAL ELEMENT

area. The remaining wetlands identified are dispersed throughout the MD locations. All wetlands are subject to review by the applicable state and federal agencies.

<b>MD-1</b>				
	OFWAM Grouping*	Unique Identifier	Size (acres)	DSL File Number
1.	MWC-1	W04-A	1.67	None
2.	MWC-1	W04-B	0.15	None
3.	MWC-1	W04-Mosaic	6.20	None
4.	MWC-2	W06	0.30	WD2012-0181
5.	MWC-3	W07	1.35	WD2005-0692
6.	MWC-2	W23	6.41	None
7.	MWC-2	W24	0.19	None
8.	MWC-8	W25	7.71	None
9.	MWC-2	W34	0.41	None
10.	MWC-2	W35	0.66	None
11.	MWC-1	W36	0.28	None
12.	MWC-3	W38	5.90	WD-2012-0181
13.	MWC-7	W82	37.15	None
14.	MWC-2	W83	0.04	None
15.	MWC-2	W84	0.47	None
16.	MWC-2	W85	0.71	None
17.	MWC-2	W86	1.87	None
18.	MWC-2	W87	0.42	WD2002-0010
19.	MWC-2	W88	0.35	None

\*OFWAM assessment code: MWC = Midway Creek Drainage

Figure 17 – MD-1

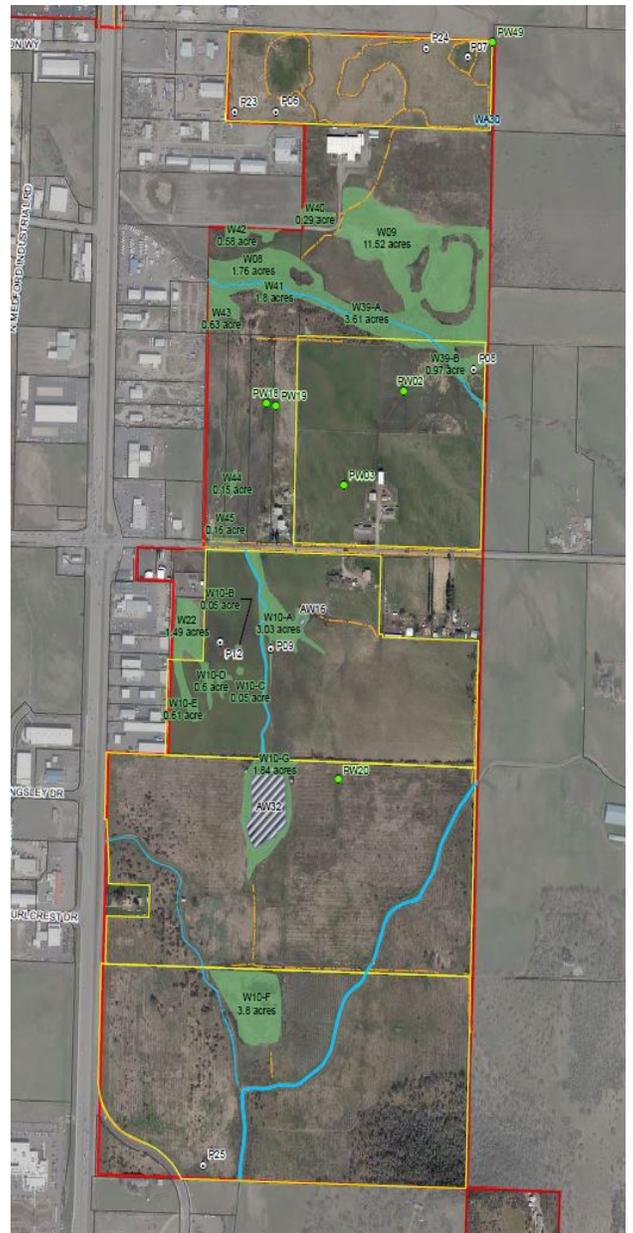


**ENVIRONMENTAL ELEMENT**

**MD-2**

	OFWAM Grouping	Unique Identifier	Size (acres)	DSL File Number
1.	MWC-4	W08	1.76	None
2.	MWC-4	W09	11.52	WD2009-0470
3.	MWC-5	W10-A	3.06	WD2007-0106
4.	MWC-5	W10-D	0.60	WD2007-0106
5.	MWC-5	W10-E	0.61	WD2007-0106
6.	MWC-5	W10-F	3.80	WD2007-0106
7.	MWC-5	W10-G	1.84	WD2007-0106
8.	MWC-5	W22	1.49	None
9.	MWC-4	W39-A	3.61	WD2009-0470
10.	MWC-4	W39-B	0.97	None
11.	MWC-4	W40	0.29	WD2009-0470
12.	MWC-4	W41	1.80	None
13.	MWC-4	W42	0.58	None
14.	MWC-4	W43	0.63	None

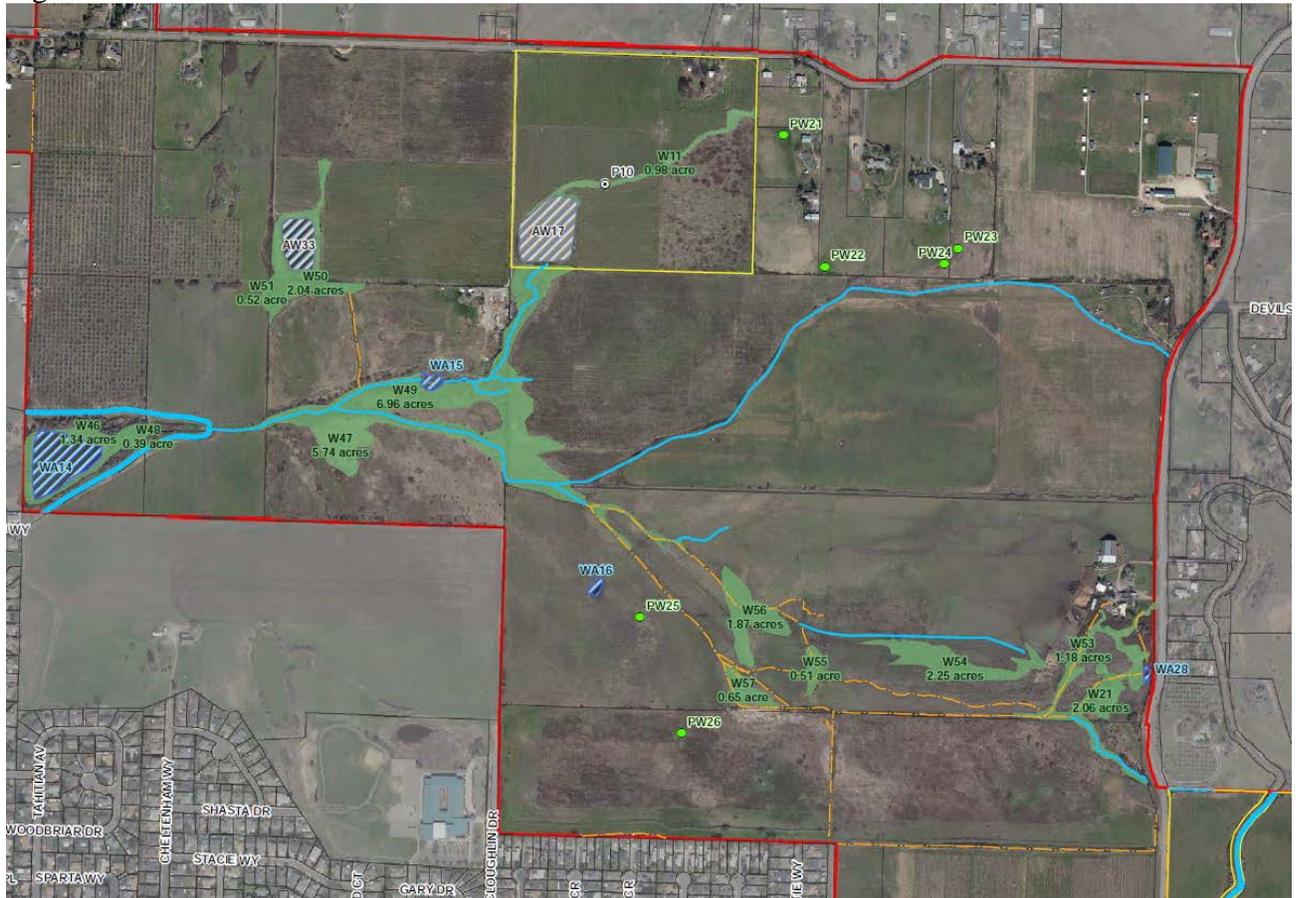
Figure 18 – MD-2



# ENVIRONMENTAL ELEMENT

<b>MD-3</b>			
	OFWAM	Unique	Size
	Grouping	Identifier	(acres)
1.	MWC-6	W11	0.98
2.	MWC-6	W21	2.06
3.	MWC-6	W46	1.34
4.	MWC-6	W47	5.74
5.	MWC-6	W48	0.39
6.	MWC-6	W49	6.96
7.	MWC-6	W50	2.04
8.	MWC-6	W51	0.52
9.	MWC-6	W53	1.18
10.	MWC-6	W54	2.25
11.	MWC-6	W55	0.51
12.	MWC-6	W56	1.87
13.	MWC-6	W57	0.65

Figure 19 - MD-3



# ENVIRONMENTAL ELEMENT

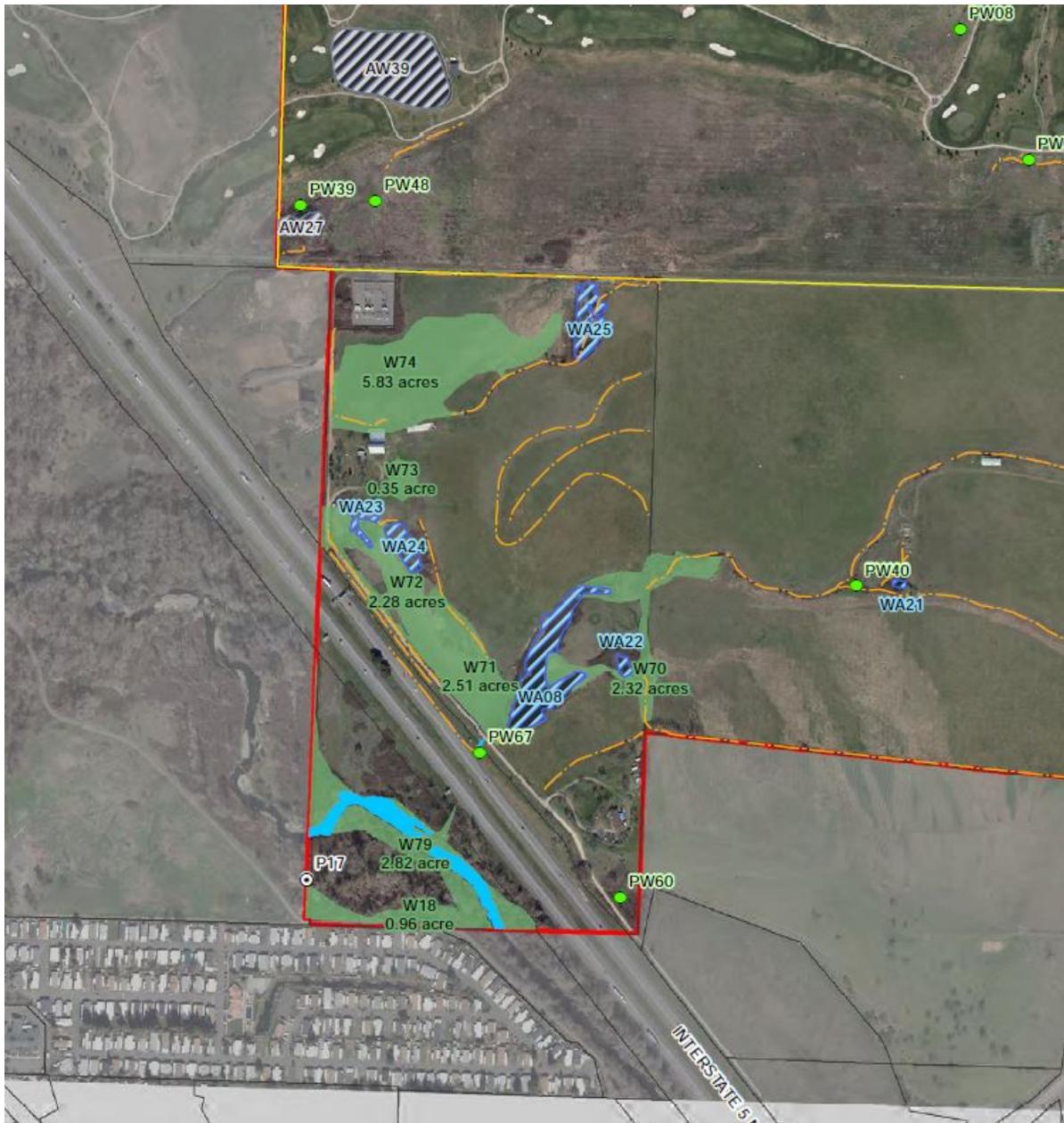
MD-5			
	OFWAM Grouping*	Unique Identifier	Size (acres)
1.	BCS-2	W13	0.96
2.	LSC-1	W14	0.59
3.	LSC-2	W15	2.05
4.	BCS-5	W18	0.96
5.	BCS-2	W66	0.79
6.	BCS-4	W70	2.32
7.	BCS-4	W71	2.51
8.	BCS-4	W72	2.28
9.	BCS-4	W74	5.83
10.	BCS-5	W79	2.82

\*OFWAM assessment codes: BCS= Bear Creek South Drainage, LSC = Larson Creek Drainage

Figure 20 – MD-5



# ENVIRONMENTAL ELEMENT



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### MD-6

	OFWAM Grouping	Unique Identifier	Size (acres)
1.	BCS-7	W19-A	6.75
2.	BCS-7	W19-B	0.49

Figure 21 – MD-6



### WETLAND REGULATIONS

The Urban Reserve was established by adoption of the Regional Plan in 2012. The City approved an Urban Growth Boundary expansion in 2016 and received State acknowledgement in 2018. Existing agreements with the County and other elements of the City's Comprehensive Plan identify how development will occur in these expansion areas.

Standards are needed to address how the goals of the wetland regulations above are being met. Wetlands (either significant or not) have been identified in almost all of the study areas. The City seeks to protect and manage these wetlands over time as land is annexed to the City.

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As noted above, the State outlines two paths for regulating wetlands, the safe harbor and standard (ESEE analysis) approaches. The City has conducted an ESEE analysis for the locally significant wetlands identified within the 2016 inventory (See full analysis in Appendix F). A summary of the conclusions follows.

Site	MD Location	Wetland IDs	Quality Determination	Goal 5 Recommendation
1	MD-6	W19-A W19-B	Moderate	Allow but reduce impacts
2	MD-5	W18 W79	High	Protect; Extend Riparian Corridor
3	MD-5	W70 W71 W72 W74	High	Allow but reduce impacts
4	MD-5	W13 W66	Moderate	Allow but reduce impacts
5	MD-5	W14 W15 W63 (not significant)	Moderate	Allow but reduce impacts; Extend riparian corridor
6	MD-3	W11 W21 W46 W47 W48 W49 W50 W51 W53 W54 W55 W56	Moderate	Allow but reduce impacts
7	MD-2	W10-A W10-D W10-E W10-F W10-G W22	Moderate	Allow but reduce impacts
8	MD-2	W08 W09 W39-A W39-B W40 W41 W42 W43	High	Allow but reduce impacts; Extend riparian corridor
9	MD-1	W82	High- Wetland of	Protect

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			Special Interest	
10	MD-1	W25	High – Wetland of Special Interest	Protect
11	MD-1	W06 W23 W24 W34 W35 W83 W84 W85 W86 W87 W88	High	Allow but reduce impacts, Extend riparian corridor
12	MD-1	W07 W38	Moderate	Allow but reduce impacts
13	MD-1	W04-A W04-B W04-mosaic W36	High; W04-Mosaic (Wetland of Special Interest)	Allow but reduce impacts; Minimize impacts to the wetland mosaic

The adoption of the 2016 Local Wetlands Inventory (LWI) to identify the existing wetlands (significant or not) is an important step in meeting State requirements as land is developed in the 2018 Urban Growth Boundary. The 2016 LWI represents best available data for use by Jackson County and the City to identify the location of wetlands until a more detailed delineation is conducted by property owners.

The 2016 Urban Reserve Local Wetlands Inventory report and appendices are adopted by reference.

*The Conclusions and Goals, Policies, and Implementation Measures for the Natural Resources - Wetlands section are listed below in conjunction with those for the Water Quality and Wildlife Habitat sections.*



### WILDLIFE HABITAT

*Statewide Planning Goal 5* emphasizes the importance of maintaining and improving Oregon's natural areas:

*"This includes land and water that has substantially retained its natural character and land and water that, although altered in character, is important as habitat for plant, animal or marine life, for the study of its natural historical, scientific or paleontological features, or for the appreciation of its natural features."*<sup>23</sup>

In OAR 660-16, *wildlife habitat* is defined as *"an area upon which wildlife depend in order to meet their requirements for food, water, shelter, and reproduction. Examples include wildlife migration corridors, big game winter range, and nesting and roosting sites."*<sup>24</sup>

### FEDERAL AND STATE REGULATIONS

The federal *Endangered Species Act of 1973* prohibits any actions that would harm an endangered species. Such actions are called a "take," which is defined as *"to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect."* The definitions of harm and harass include taking any actions that would modify or degrade the habitat of the species if it significantly impairs or disrupts breeding, spawning, migrating, feeding, sheltering, etc. The *Oregon Endangered Species Act* (OESA), adopted in 1987, requires state agencies to develop programs for the management and protection of *endangered* species. It also requires state agencies to comply with adopted guidelines for *threatened* species. The OESA also covers some species that are not listed by the federal *Endangered Species Act*.

Local governments must utilize information from state and federal agencies, including the Oregon Department of Fish and Wildlife (ODFW), to inventory significant wildlife habitat under the prescribed Goal 5 process. Under the safe harbor provisions, a local government may determine that *significant* wildlife habitat occurs only under certain circumstances, and does not include fish habitat. (Fish habitat is addressed later under riparian corridor protections.) Jurisdictions are then required to develop plans to protect significant wildlife habitat. Significant wildlife habitat includes sites where the habitat performs a life support function or has more than

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<sup>23</sup>*Oregon's Statewide Planning Goals and Guidelines, 1995 Edition*, Oregon Department of Land Conservation and Development.

<sup>24</sup>*Oregon Administrative Rules, 660-23-110*, Oregon Department of Land Conservation and Development, September 1, 1996.

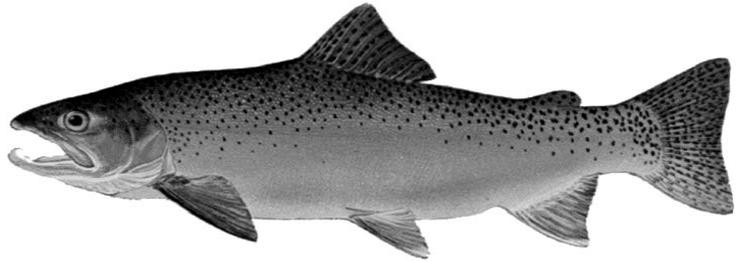
## ENVIRONMENTAL ELEMENT

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incidental use by a wildlife species listed by the federal government as *threatened* or *endangered*, or by the state as *threatened*, *endangered*, or *sensitive*. It also includes documented nesting or roosting sites for osprey or great blue herons, and sites identified as habitat for a *wildlife species of concern* or *habitat of concern* by the ODFW. The Medford UGB has not been found to contain any of these types of wildlife habitats; however, should any be identified in the future, a protection plan will be formulated by the city.

A wide variety of animal species exist in Medford's riparian, wetland, savanna (scattered trees and shrubs), grassland, and woodland environments. Agricultural and residential areas are also home to certain wildlife species. Southeast Medford contains some of the most natural stream, riparian, and wetland habitats within the city. Additionally, it has most of Medford's savanna,

grassland, and woodland environments. Each of these habitats is significant to various species of mammals, fish, birds, reptiles, amphibians, and insects. The foothills above the Medford UGB provide habitat for black tailed deer, cougars, and coyote. While instream and wetland habitats are important,



the dry land habitats, such as oak woodlands and open meadows, play an important role in the resident and transitory wildlife of the Bear Creek Valley. Through the various tributary streams, the surrounding forested uplands are connected to the Bear Creek riparian corridor, providing avenues for plant and animal dispersement and interchange. An inventory of the wildlife in the Medford UGB and the types of habitat they are dependent upon is contained in **Appendix A**.

### RIPARIAN CORRIDORS

A *riparian area* is defined as the area of transition from an aquatic ecosystem to a terrestrial ecosystem. A *riparian corridor* is the area within a boundary established along both sides of a waterway, including the riparian area and any associated wetlands. Goal 5 requires riparian corridor regulations to be applied to those waterways identified as being *fish-bearing streams*, and any other waterways having riparian areas determined to be significant. A fish-bearing stream is one inhabited anytime of the year by anadromous or game fish, or fish listed as *threatened* or *endangered* under federal or state *Endangered Species Acts*. According to ODFW, fish-bearing streams in the 2010 Medford Urban Growth Boundary (UGB) include Bear Creek, and portions of Elk Creek, Swanson Creek, Lone Pine Creek, Lazy Creek, Larson Creek, Gore Creek, and Crooked Creek. Due to their use by indigenous anadromous salmonids, these streams are considered "essential salmon habitat" by DSL. Medford's Riparian Corridor ordinance was adopted on June 1, 2000 to meet the requirements of Goal 5. See **Figure 7** for a map indicating the riparian corridors in the 2010 Medford UGB.

### RIPARIAN INVENTORY AND ASSESSMENT: BEAR CREEK TRIBUTARIES

Medford completed an inventory of the tributaries to Bear Creek in the Medford UGB in June 2002. The purpose of the project was to inventory the riparian habitat along the streams and assess riparian area functions. The consultant assessed the function of the stream reaches for flood management, wildlife habitat, thermal (temperature) regulation, and water quality protection. A set of four drainage basin maps delineates the streams by "reach". Riparian reaches are segments of streams and adjacent riparian areas that have similar physical characteristics

## **ENVIRONMENTAL ELEMENT**

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such as vegetation type, slope, geomorphic stream features (e.g., pool, riffle, or run), or land use. The riparian areas on the right and left sides of a stream are considered separate reaches. Land use changes, followed by changes in riparian vegetation, were the most common factors used to identify reaches. A minimum reach length of 300 feet was used.

The riparian function of each reach was assessed using Riparian Characterization Forms and Riparian Function Assessment Forms, which have multiple-choice questions related to its ability to provide flood management, wildlife habitat, thermal (temperature) regulation, and water quality protection. Each answer has an associated point score, and the total score for each of the four functions indicates if the level for that reach is high (intact), medium (somewhat degraded) or low (severely degraded). A set of four function (flood management, wildlife habitat, thermal (temperature) regulation, and water quality protection) maps shows the level for each of the reaches. The document and maps are viewable or downloadable as a PDF from the City of Medford website.

### **BEAR CREEK**

Bear Creek, which traverses north/south through the center of the Medford UGB, and its riparian areas provide a particularly valuable habitat for riparian mammals, reptiles, and amphibians, and a wide variety of migratory and resident bird species. Both anadromous and resident fish species are present in Bear Creek. However, the long range potential for preservation and maintenance of aquatic life is limited unless the water quality of Bear Creek is improved. Bear Creek, in the entire 2010 Medford UGB, is designated a Riparian Corridor. By implementing the provisions of Goal 5 for riparian corridors, fish populations found in Bear Creek, including winter and summer steelhead, Coho salmon, spring and fall Chinook salmon, cutthroat trout, and resident rainbow trout, will continue to improve. **Figure 8** suggests measures individuals and landowners can take to help improve instream salmon and habitats.

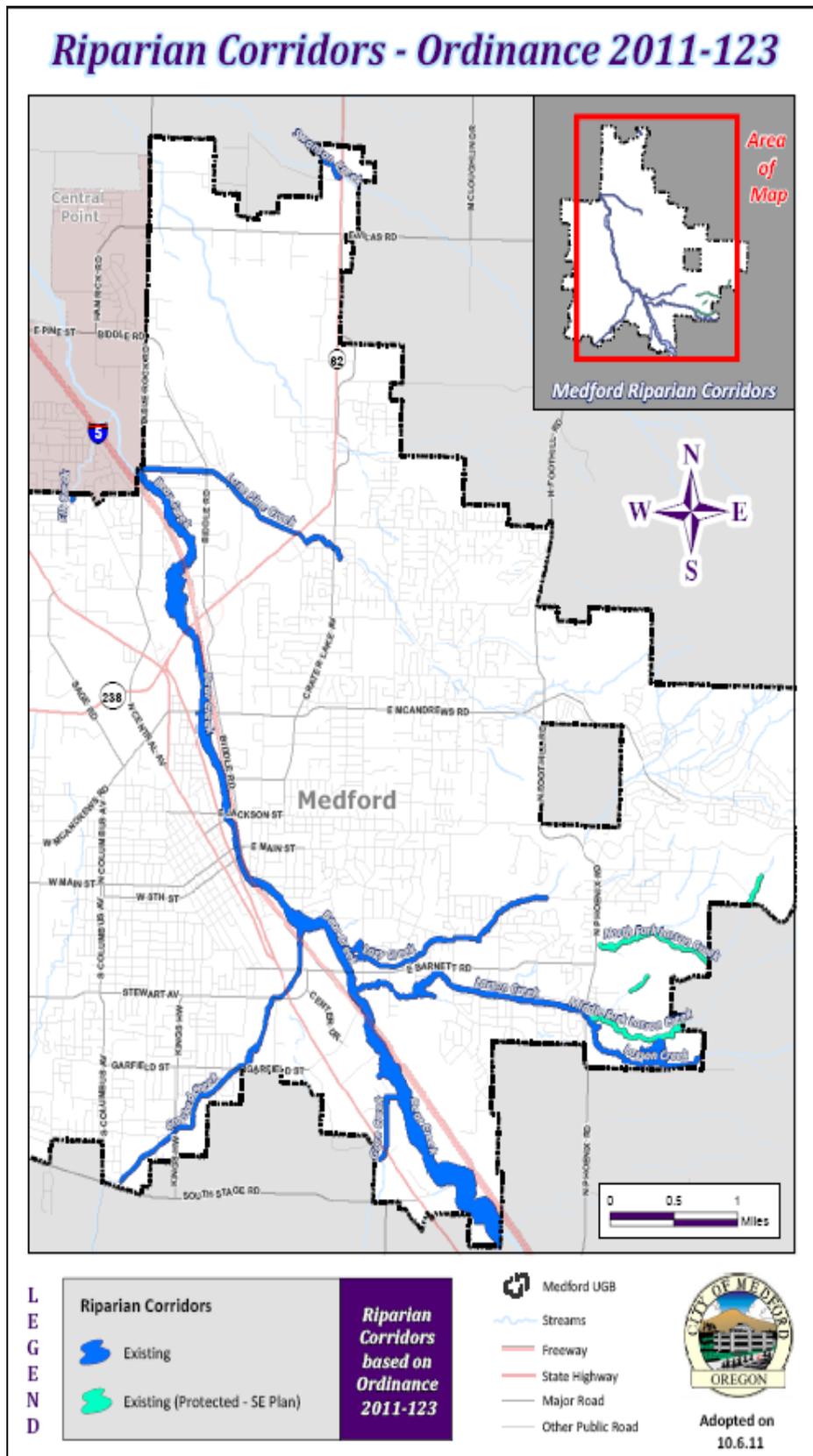
The Bear Creek Greenway, a linear park that also provides valuable habitat for wildlife, was first conceived in the 1960s. The ultimate goal of the Bear Creek Greenway Foundation is the completion of the Greenway from Ashland to the confluence with the Rogue River near Gold Hill. The multi-use path, which follows the creek within the Bear Creek Greenway, was designated as a National Scenic Trail in 1975, and is part of the Oregon Recreational Trail system. In the Medford area, the path, from South Stage Road to East Pine Street in Central Point near the Jackson County Expo (fairgrounds), is complete. Additional street and off-street segments extend it to Blackwell Road. With access points to the path at a number of major arterial streets in Medford, the path serves as a primary means to travel by bicycle or foot in a north-south direction through central Medford.

The Bear Creek riparian corridor within the Medford UGB north of the new Interstate 5 South Interchange at Highland Avenue is highly developed to within 20 or 25 feet of the creek, but south of the interchange, contains significant wildlife habitat and is relatively undeveloped. Much of the corridor south of the interchange is in public ownership, including in the City's U.S. Cellular Community Park and several County-owned Greenway parcels.

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\* added for reference only, not to be included in Comprehensive Plan Amendment

Figure 7: Medford Area Riparian Corridors



**Figure 8**  
**Things You Can do to Help**  
**Restore Salmon Habitats**

- 1) Plant native trees and shrubs along streams to help stabilize the banks and provide cooling shade for the water.
- 2) Use fencing to keep livestock from damaging stream banks.
- 3) Avoid operating heavy equipment in streams, which can ruin spawning beds, create sediment problems, and cause other long-term damage.
- 4) Limit impacts on waterways to only those essential to your operation. Consult with necessary agencies before you act. Oregon and federal laws prohibit diking, channelizing, and water diversions without a permit, and provide a clear set of operational guidelines. Dredging or removing material from rivers is also tightly regulated. **You may not place any artificial structure in a stream or river that blocks fish passage.**
- 5) Check with DEQ about responsible runoff management at your site. Construction can cause serious sediment problems, even well away from a waterway, if stormwater is not properly contained. State law requires larger earth-disturbing developments to go through a permitting process. While smaller operations may not need permits, they can still have impacts.
- 6) If you must use a septic tank, be sure it is properly designed, located, and well maintained. Poorly performing septic tanks can contaminate groundwater and nearby streams.
- 7) Dispose of household chemicals, such as used motor oil, antifreeze, pesticides, paints, etc., at approved collection facilities in your area. Call your local DEQ office for your disposal options.

Source: Oregon Department of Environmental Quality

**LARSON CREEK**

The Larson Creek stream system is another significant stream system within the UGB that has the potential to become a showcase anadromous fish-bearing stream system. Although needing enhancement, it still has the potential to return to a properly functioning condition. Many of the branches and tributaries of Larson Creek are intermittent streams that run low or under gravel during the summer months. Those that are not intermittent may be supplemented by irrigation return flows. Although impacted by urban development, the section of the creek between Bear Creek and North Phoenix Road contains some important riparian areas and wetlands, and is suitable for enhancement and restoration activities. A multi-use path has been planned along this section of the creek since the 1970s, although only small sections between Black Oak Drive and Larson Creek Drive have been constructed.

The three forks of Larson Creek that traverse the Southeast Area were once all fish-bearing streams that provided steelhead spawning and rearing habitat. A Medford Irrigation District (MID) canal along North Phoenix Road intercepted each fork, reducing or preventing fish passage. An improvement project has reconnected the South Fork with the Middle Fork just east of North Phoenix Road, enhancing fish passage. The canal in this area has been piped. Larson Creek is designated a Riparian Corridor from Bear Creek to North Phoenix Road,. In addition, the South Fork is designated a Riparian Corridor from North Phoenix Road, east to the 2010 Medford UGB.

Recognizing that Southeast Medford is significant to the overall health of Larson Creek, the Southeast Plan of the “General Land Use Plan Element” and the Southeast (S-E) Overlay Zoning District, adopted in 1998, provide for a “Greenway” designation applied to all three forks of the creek. The overlay district provides a 50-foot structural setback in most segments and restrictions on activities within the setback area. Riparian and instream enhancement activities are encouraged. The vegetative cover is also encouraged to remain as close to natural conditions as possible. Healthy, lush vegetation provides not only cover from fish predation and regulation of water temperature, but also habitat for food sources (insects), and reduces stress by limiting disturbance to the fish. Multi-use paths are planned along forks of the creek, and small segments have been constructed as of 2010.

## **ENVIRONMENTAL ELEMENT**

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### **RIPARIAN CORRIDOR ORDINANCE**

As noted in the “Water Quality” section, to comply with Goal 5 requirements for riparian corridors, specific regulations must be adopted in the Medford *Land Development Code*.

Per the Medford *Land Development Code*, the purposes of establishing riparian corridors are:

1. To implement the goals and policies of the “Environmental Element” and the “Greenway” General Land Use Plan (GLUP) designation of the *Medford Comprehensive Plan* and achieve their purposes.
2. To protect and restore Medford’s waterways and associated riparian areas, thereby protecting and restoring the hydrologic, ecologic, and land conservation functions these areas provide for the community.
3. To protect fish and wildlife habitat, enhance water quality, control erosion and sedimentation, and reduce the effects of flooding.
4. To protect and restore the natural beauty and distinctive character of Medford’s waterways as community assets.
5. To provide a means for coordinating the implementation of the Bear Creek Greenway and other greenways or creek restoration projects within the City of Medford.
6. To enhance the value of properties near waterways by utilizing the riparian corridor as a visual amenity.
7. To enhance coordination among local, state, and federal agencies regarding development activities near waterways.

When reviewing development applications for properties containing a riparian corridor, the approving authority must consider how well the proposal satisfies these objectives. As required by Goal 5, the ordinance provides for a riparian corridor boundary of 50 feet, measured from the top-of-bank along both sides of waterways with an average annual flow of less than 1,000 cubic feet per second (cfs) and identified as being fish-bearing streams, or other waterways having riparian areas determined to be significant.

To sustain and enhance Medford’s existing wildlife habitats, both aquatic and terrestrial, it is important to identify and designate areas as riparian corridors, greenways, wetlands, and other open space preserves. These areas will not only sustain wildlife habitat, but also satisfy the requirements for its protection as mandated by Goal 5. Preserving the existing natural corridors is critical to the preservation and enhancement of wildlife for several reasons. For terrestrial wildlife, particularly those species that require large home ranges, connecting corridors are an essential habitat element, as they permit access into areas that may be otherwise too small to use if isolated. For less transient species, corridors are important in the long-term as they allow movement between populations, providing for genetic exchange and more healthy individuals.

### **SWANSON CREEK**

A small portion of the Swanson Creek drainage basin is within the 2010 Medford UGB. Swanson Creek, located north of Vilas Road, is a tributary to Whetstone Creek, and is perennial due to irrigation return flows. Swanson Creek is designated a Riparian Corridor from the 2010 Medford UGB, east 0.38 miles to Highway 62.

## **ENVIRONMENTAL ELEMENT**

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### **ELK CREEK**

The Elk Creek drainage basin in the 2010 Medford UGB contains Elk Creek and a single remnant segment of an unnamed tributary. All reaches of the Elk Creek drainage basin are perennial due to irrigation return flows. All of the streams and riparian areas in the basin have been modified by human activity, including placement of long stream segments into underground pipes, stream channelization, removal of woody vegetation, residential, commercial and industrial development, haying, grazing and mowing for fire control. The lower 1.5 miles of Elk Creek are piped. Elk Creek is designated a Riparian Corridor from Beall Lane (the 2010 Medford UGB), south 0.05 miles.

### **LONE PINE CREEK**

The Lone Pine drainage basin contains Lone Pine Creek, and a number of unnamed tributaries in the upper portion of the basin. The lower reaches are perennial due to irrigation return flows. The upper reaches are intermittent. There are several large wetland areas along stream segments in the middle portion of the basin. Almost all of the streams and riparian areas in the basin have been extensively modified by human activity including placement of long stream segments into underground pipes, stream channelization, placement of stream segments in concrete channels, removal of woody vegetation, residential development, agricultural cropping, mowing for fire control and grazing. Lone Pine Creek is designated a Riparian Corridor from Bear Creek, east 1.38 miles to Highway 62.

### **LAZY CREEK**

The Lazy Creek drainage basin contains Lazy Creek, and a number of unnamed tributaries in the upper portion of the basin. The lower reaches are perennial due to irrigation return flows. The upper reaches are intermittent. There are three large wetland areas directly above the confluence with Bear Creek. The wetlands appear to contain the original channel of Lazy Creek prior to the excavation of a new channel at some time in the past. Almost all of the streams and riparian areas in the lower reaches of the basin have been extensively modified by human activity including placement of long stream segments into underground pipes, stream channelization, placement of stream segments in concrete channels, removal of woody vegetation, residential development, golf course development, and mowing for fire control.

The upper reaches have not been as consistently modified by human activity as the lower reaches; however, a number of the upper reaches have had extensive modification due to the placement of stream segments into underground pipes, removal of woody vegetation and residential development. The highest reaches in the Lazy Creek drainage basin are in the least developed landscapes in the Medford UGB, and have been impacted only through grazing activity and construction of dirt roads. These areas have relatively undisturbed stream channels and riparian areas with intact native Oregon White Oak savanna plant communities.

The stream channel is usually a willow-dominated wetland within a narrow gully. The banks of the gully have Oregon Ash and willow, and Oregon White Oak grow at the top of the bank. Lazy Creek from is designated a Riparian Corridor Bear Creek, east 1.94 miles.

## **ENVIRONMENTAL ELEMENT**

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### **GORE CREEK**

Gore Creek is located in the Bear Creek South drainage basin. It is perennial due to irrigation return flows. It has been extensively channelized, and its riparian areas have been modified by construction of apartments, warehouses, parking lots, agricultural cropping and grazing. The lowest reach near Bear Creek, once containing black cottonwood, willow and Oregon Ash, has been rerouted. Gore Creek is designated a Riparian Corridor from Bear Creek, southwest 0.82 miles to the railroad tracks.

### **CROOKED CREEK**

The Crooked Creek drainage basin contains Crooked Creek and a single tributary, Hansen Creek. All of the reaches are perennial due to irrigation return flows. All of the streams and riparian areas in the basin have been modified by human activity including placement of long stream segments into underground pipes, stream channelization, removal of woody vegetation, residential and industrial development, haying, golf course development, and mowing for fire control. The lower one half mile of both Crooked and Hansen Creeks are piped. Riparian areas in this basin have limited woody vegetation. Crooked Creek is designated a Riparian Corridor from Bear Creek, southwest approximately 2.24 miles to South Stage Road (the 2010 Medford UGB).

**NATURAL RESOURCES  
WATER QUALITY, WETLANDS, AND WILDLIFE HABITAT  
CONCLUSIONS**

1. While the groundwater beneath the valley floor is not the domestic water source for the Medford planning area, it is a regionally important natural resource primarily due to its use as a domestic water source for individual wells.
2. Bear Creek and its tributaries are critically important natural resources, yet suffer from poor water quality due to forest and agricultural practices and urban point and non-point discharges.
3. The poor water quality of Bear Creek and its tributaries is partially attributable to non-point pollution from diffuse sources, such as stormwater, agricultural runoff, and septic system seepage. Non-point pollution sources can significantly damage water quality, yet are more difficult to pinpoint and treat than conventional point sources of water pollution.
4. Natural resource cleanup programs involving local schools, clubs, and civic organizations, such as those sponsored by the Bear Creek Watershed Council, are excellent means to engage the public in environmental education. The presence of waterways such as Bear Creek and Larson Creek, and various wetlands in Medford provides a platform for such programs.
5. The City of Medford recognizes wetlands as valuable urban resources that can provide water quality maintenance, stormwater detention, wildlife habitat, and open space. Medford's 2002 *Medford Local Wetlands Inventory and Locally Significant Wetland Determinations* by Wetland Consulting identified and assessed most of the wetlands, in the Urban Growth Boundary. The 2002 *Medford Riparian Inventory and Assessment Bear Creek Tributaries* by Wetland Consulting inventoried and assessed the waterways that are tributary to Bear Creek. The City of Medford hired SWCA Environmental in 2015 to conduct a Local Wetland Inventory for the Urban Reserve established in 2012. Locally significant wetlands were identified in five of the MD areas.
6. Occasionally, the protection of a locally significant wetland (one that has been determined to have significant value according to state criteria) must be balanced against other important community goals. An exceptional "conflicting use" may be more important to the long-term needs of the citizens than preservation of the wetland area.
7. The Medford UGB has been evaluated for potential wetland mitigation sites. Wetland mitigation involves the restoration, enhancement, or creation of wetlands to compensate for permitted wetland losses elsewhere. Restoration and enhancement of existing wetlands is the wetland mitigation most likely to be successful in Medford due to its ecologic and climatic characteristics.
8. Although Bear Creek and the Bear Creek Greenway contain Medford's most valuable fish and wildlife habitat, fish and wildlife habitat exists elsewhere within the Urban Growth Boundary. As of June 8, 2005, portions of the following streams have been identified by ODFW as fish bearing streams, and should be protected per Statewide Planning Goal 5

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(OAR 660-023) through the imposition of Riparian Corridor Regulation. These streams, or portions thereof, include: Bear, Elk, Swanson, Lone Pine, Lazy, Larson, Gore, and Crooked Creeks.

### NATURAL RESOURCES WATER QUALITY, WETLANDS AND, WILDLIFE HABITAT GOALS, POLICIES, AND IMPLEMENTATION MEASURES

**Goal 4:** *To preserve and protect Medford's ground water resources and recharge zones.*

**Policy 4-A:** The City of Medford shall ensure the protection of the Big Butte Springs domestic water source working in cooperation with Jackson County.

**Implementation 4-A (1):** Continue to undertake efforts to protect the Big Butte Springs recharge area from improper use through implementation of a watershed management program.

See also the policies of the *Domestic Water* section of the "Public Facilities Element."

**Policy 4-B:** The City of Medford shall protect ground water recharge areas in the planning area by striving to restore and maintain the natural condition of watersheds, waterways, and flood plains.

**Implementation 4-B (1):** Review the *Medford Land Development Code*, and propose amendments where necessary to assure that the amount of impervious surface in development projects is minimized and opportunities for permeation are maximized.

See also the policies of the *Wastewater Collection* section of the "Public Facilities Element."

**Goal 5:** *To achieve and maintain water quality in Medford's waterways.*

See also the goals of the *Storm Water Drainage* section of the "Public Facilities Element" and related policies and implementation strategies.

**Policy 5-A:** The City of Medford shall implement regulations that pertain to discharges into the Rogue River, Bear Creek, and their tributaries, such as the federal *Clean Water Act*.

**Implementation 5-A (1):** Continue to actively participate in regional water quality monitoring and planning efforts.

**Policy 5-B:** The City of Medford shall implement measures to reduce polluted surface water runoff into the storm drainage system.

**Implementation 5-B (1):** Implement the recommendations of the 1996 *Comprehensive Medford Area Drainage Master Plan*, or any updates, regarding surface water runoff quality.

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**Implementation 5-B (2):** Develop and impose design standards for filtering and slowing runoff from paved areas using such methods as vegetated swales, on-site detention ponds, or other technologies as they become feasible, to cleanse the water before entering primary waterways.

**Implementation 5-B (3):** Require the use of natural waterways for storm drainage wherever possible, to decrease flow speed and increase filtering prior to the runoff entering a primary waterway.

**Implementation 5-B (4):** Continue to assess storm drainage system development charges and utility fees to assist in the financing and maintenance of public storm drainage improvements, and periodically review for adequacy.

See also Implementation 2-B (2) of the Southeast Plan section of the “General Land Use Plan Element.”

**Goal 6:** *To recognize Medford’s waterways and wetlands as essential components of the urban landscape that improve water quality, sustain wildlife habitat, and provide open space.*

**Policy 6-A:** The City of Medford shall regulate land use activities and public improvements that could adversely impact waterways in the interest of preserving and enhancing such natural features to improve water quality and fish and wildlife habitat.

**Implementation 6-A (1):** Prepare amendments to the Medford *Land Development Code* for consideration by the City Council that adopt the riparian corridor “safe harbor” setback (50 feet from the top of the bank) for Bear Creek and other streams determined to contain fish habitat or significant riparian areas in compliance with Oregon Administrative Rules 660-23.

**Policy 6-B:** The City of Medford shall regulate land use activities and public improvements that could prevent meeting the federal performance standard of *no net loss* of wetland acreage.

**Implementation 6-B (1):** Prepare amendments to the Medford *Land Development Code* for consideration by the City Council to adopt “safe harbor” protections or protection developed through an ESEE (environmental, social, economic, and energy) analysis for locally significant wetlands, as defined, pursuant to Oregon Administrative Rules 660-23.

**Policy 6-C:** The City of Medford shall encourage the incorporation of waterways, wetlands, and natural features into site design and operation of development projects.

**Implementation 6-C (1):** Promote clustered development in order to avoid alteration of topographical and natural features, to reduce impervious surfaces, and to enhance the aesthetics of development projects. Investigate incentives for clustering development.

**Policy 6-D:** The City of Medford shall support the efforts of organizations such as the Bear Creek Watershed Council and the Bear Creek Greenway Foundation, which strive to improve the quality of Bear Creek and its tributaries with activities such as greenway formation,

## **ENVIRONMENTAL ELEMENT**

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environmental education workshops, creek cleanup events, etc.

See also Policies 2-A and 2-B of the *Southeast Plan* section of the “General Land Use Plan Element.”

**Goal 7: *To preserve and protect plants and wildlife habitat in Medford.***

**Policy 7-A:** The City of Medford shall encourage the conservation of plants and wildlife habitat, especially those that are sensitive, rare, declining, unique, or that represent valuable biological resources, through the appropriate management of parks and public and private open space.

**Implementation 7-A (1):** Develop a long range open space plan for consideration by the City Council that provides for an integrated system of parks, creekside greenways, wetlands, and paths/trails in Medford to enhance the biological diversity and long-term viability of natural resource areas. Coordinate the plan with the *Medford Parks, Recreation, and Leisure Services Plan*, the *Comprehensive Medford Area Drainage Master Plan*, and other relevant plans.

**Implementation 7-A (2):** Develop and implement regional plans for greenways, wetlands, and linear parks with Jackson County, as wildlife often travel paths that cross jurisdictional boundaries.

**Implementation 7-A (3):** Distinguish public greenways, waterways, wetlands, and parks with interpretive and informational signage regarding on-site natural resources.

**Policy 7-B:** The City of Medford shall strive to maintain, rehabilitate, and enhance Medford’s waterways, using features such as gently sloped banks, natural riparian vegetation, and meandering alignment.

**Implementation 7-B (1):** For those riparian areas within the planning area that are not subject to the safe harbor regulations, prepare amendments to the *Medford Land Development Code* using the *Medford Riparian Area Inventory and Assessment Bear Creek Tributaries, 2002*, by Wetland Consulting for consideration by the City Council, that adopt a setback or similar protection.

**Implementation 7-B (2):** Ensure that improvements, such as multi-use paths and storm drainage facilities sited in or near riparian corridors, waterways, wetlands, or other fish and wildlife habitat, include protective buffers, preserve natural vegetation, and comply with the requirements of Oregon Administrative Rules 660-23.

**Policy 7-C:** The City of Medford shall strive to protect fish and wildlife habitat in accordance with Oregon Department of Fish and Wildlife’s (ODFW) management plans.

### SOILS

#### SOIL SURVEYS

Soil surveys, conducted by the U.S. Soil Conservation Service (SCS), are the most widely used sources of soil information. Surveys provide soil descriptions, soil distribution maps, and various data and guidelines on soil uses and limitations on a county-wide basis. In the past, soil mapping focused on suitability for crops, but has more recently taken a role in planning and architecture, focusing on the suitability of soils for roads and buildings. Understanding varying physical properties of soils, particularly composition, texture, and permeability, is important not only in siting facilities, but also in designing stormwater systems, and in determining long term soil stability.

#### SOIL CHARACTERISTICS

The soil characteristics in an area are critical in determining the nature of appropriate land development. The major features or properties used to describe soils are *composition* and *texture*. These properties can be used to determine permeability, bearing capacity, erodibility, and slope stability. The materials that make up soil (*composition*) are mineral particles, organic matter, water, and air. The relative amounts of the various mineral particles (clay, silt, sand, gravel) determine the soil *texture*.

The ability of the soil to move water downward is usually referred to as permeability, infiltration capacity, or percolation. Soils within the Medford UGB range from SCS Class B (moderate infiltration) to Class D (low infiltration). They range from deep, moderately-permeable soils in lower elevations (the most permeable soils are found near Bear Creek), to shallow soils of low permeability at intermediate elevations, and exposed bedrock (least permeable) in the foothills.<sup>26</sup> The latter, especially when combined with steep slopes, is prone to high stormwater runoff rates, an important factor to consider with the trend toward increased hillside development.

Soil permeability, bearing capacity, shrink/swell potential, erodibility, and stability are critical properties when making decisions regarding development. Given thorough consideration of the soils in the Medford UGB, most types of urban development can occur in most locations. In some areas, however, structural alterations are necessary to balance poor soil. In other areas, especially where development is anticipated to place heavy loads on the soil, excavation of the existing topsoil and replacement with more stable, compactible material is required. Construction techniques and materials must be suited to the type of soil to limit the potential for damage to structures. A foundation analysis conducted by a registered engineer is required by the City of Medford for projects on *expansive soils* to determine if corrective measures are necessary before construction. Highly expansive soils can cause structural damage to foundations and roads, and are less suited for development, primarily because they absorb water and swell, then shrink during drying.

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<sup>26</sup>*Comprehensive Medford Area Drainage Master Plan, Volume II, Technical and Stormwater Management Appendices, Brown and Caldwell, September, 1996.*

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### AGRICULTURAL SOILS

Goal 3 of the *Statewide Planning Goals*, “Agricultural Lands,” promotes the preservation and maintenance of agricultural lands, stating, “*Agricultural lands shall be preserved and maintained for farm use, consistent with existing and future needs for agricultural products, forest and open space and with the state’s agricultural land use policy.*”<sup>27</sup> It suggests that urban development be separated from agricultural lands by buffers or transitional areas of open space. To alleviate some problems inherent to having agricultural uses adjacent to urban development (vandalism, noise, dust, overspray), the City of Medford adopted an agricultural buffering ordinance in the 1980s.

Consideration of soil fertility, grazing suitability, climatic conditions, existing and future availability of irrigation water, land-use patterns, technological and energy inputs required, and accepted farming practices are criteria for classifying soils suited for agriculture.<sup>28</sup> In western Oregon agricultural lands, as classified by the SCS Soil Capability Classification System, are predominantly Class I - VI, considered suitable for farm use. Agricultural lands are ranked by Goal 3 with Class I soils assigned the highest priority for preservation, and Class VI the lowest. The City of Medford took an “exception” to Goal 3, and was permitted to include some agricultural lands within the UGB for urban development in 1990. One agricultural area, however, the 240-acre Hillcrest Orchard, was left out of Medford’s UGB in 1990, and is completely surrounded by land inside the UGB.

According to a 1993 *Mail Tribune* series on growth in the Rogue Valley, urbanization has historically been the most critical factor affecting agriculture in the region.<sup>29</sup> Growth often infers utilizing prime agricultural land; however, Medford’s future growth is being directed to the east, where the agricultural capability is lower, conserving the more fertile land to the west for agriculture. In the “Urbanization Element” of the *Medford Comprehensive Plan*, both the city and Jackson County acknowledge that protecting agricultural soils outside the UGB is an important priority, not only on a local level, but on a statewide level, and policies to maintain and buffer these lands have been adopted by both jurisdictions.

### HILLSIDE DEVELOPMENT AND EROSION

**Figure 9**, *Slope Map for the Medford Area*, adapted from a geological hazard map prepared by the Oregon Department of Geology and Mineral Industries (DOGAMI) in 1977, illustrates the varying degrees of slope within the Medford UGB. Overall, west Medford is relatively flat, with slopes of 0 to 5%. Slopes increase toward the east to more than 15%, and become steeper into the foothills, where slopes of 30 to 50% or greater exist. The maximum slope advisable for urban development is usually less than 25%.<sup>30</sup>

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<sup>27</sup>*Oregon’s Statewide Planning Goals and Guidelines*, 5th Edition, Oregon Department of Land Conservation and Development, September 1, 1996.

<sup>28</sup>*Ibid.*

<sup>29</sup>“Growth’s pains for farmers”, *The Mail Tribune*, December 19, 1993.

<sup>30</sup>*Landscape Planning: Environmental Applications*, 2nd Edition, William M. Marsh, 1991.

**Figure 9**  
**Slope Map for the Medford Area**

Given a choice of sites on which to live, many people prefer hillier terrain with open views.

## ENVIRONMENTAL ELEMENT

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While level or gently sloping sites are usually necessary for most industrial and commercial uses, hillsides in or near urban areas are popular for residential development. Hillside development is typically more expensive than development on level ground. The preparation of a site, grading for streets, and provision of sewer and water service is all more costly, as is the actual building construction. The costly nature of hillside development has serious implications in producing neighborhoods of mixed housing types and income levels. Additionally, emergency response situations, such as firefighting, are more difficult on steeper grades.

Slopes altered to suit urban development can also result in difficulties due to (1) the placement of structures and facilities on slopes that are already unstable, or (2) the disturbance of stable slopes, resulting in failure, accelerated erosion, and ecological deterioration of the slope environment.<sup>31</sup> Often, hillside soils consist of expansive clay and are characterized by instability. Landslides and soil erosion from development are particularly common in areas where the soils have low *shear resistance*, or the inability to withstand downward movement. Unstable ground exists in areas of east Medford south of Prescott Park on the slopes of Roxy Ann Peak, which was caused by earthflow or landslides that occurred before recorded history. Expansive clay soils, averaging four to five feet in depth, exist in this area, and extend toward the valley floor. In some areas where there has been earthflow or downslope “creep,” the clay can be more than 20 feet in depth. The shrink-swell area, affected by fluctuations in moisture content, can extend up to eight feet beneath the surface.<sup>32</sup> As noted above, since expansive soil can cause structural damage to foundations, a foundation analysis is required for construction in this area.

Besides creating difficulties in structure, road, and utility construction, and in establishing a connected street system, hillside development can have profound effects on the quality of stormwater runoff. Urban development, particularly activities such as land clearing, deforestation, and the use of impervious materials, increases the rate of runoff and produces difficulties with maintaining or improving water quality.<sup>33</sup> **Figure 10** describes strategies to minimize erosion and environmental degradation in hillside development. The City of Medford regulates erosion through development permit and inspection processes. Prior to development, a drainage grading plan depicting existing and proposed drainage conditions must be prepared. In addition, the *National Pollutant Discharge Elimination System* (NPDES) permitting process implemented by the Oregon Department of Environmental Quality (DEQ) requires stormwater permits and erosion control plans for all construction sites of one acre or larger.

Soil erosion can result in land surface and stream bank deterioration, and the eroded materials can clog pipes, culverts, channels, ponds, and other drainage structures. If these factors ultimately reduce capacity, flooding can result. Additionally, *sediment loading* in receiving streams increases the turbidity, negatively impacting fish and other aquatic life.<sup>34</sup> Erosion and the effects of development on soils are important planning issues, and land use regulations should

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<sup>31</sup>Ibid.

<sup>32</sup>*Geologic Hazards of the Roxy Ann Butte/East Medford Area*, Ferrero Geologic, Ashland, Oregon, 1995.

<sup>33</sup>*Landscape Planning: Environmental Applications*, 2nd Edition, William M. Marsh, 1991.

<sup>34</sup>*Comprehensive Medford Area Drainage Master Plan*, Brown and Caldwell, September 1996.

**Figure 10**  
**Critical Questions for Planning Residential, Industrial, and Commercial Projects to Minimize Soil Erosion and Environmental Degradation**

- 1) What percentage of the site exceeds 15% slope, and, of this area, how much is proposed for development? If developed, what percentage will be affected by construction?
- 2) What percentage of the site is forested or grassy, or shrub covered, and what percentage of ground cover will be destroyed as a result of the development?
- 3) What is the minimum distance between the proposed development zone, water features (wetlands, streams, ponds), and existing drainage facilities (storm sewers, stormwater retention ponds, and streams)?
- 4) What are the proposed erosion and sedimentation control measures for the construction and operational phases of the proposed project?
- 5) What is the anticipated length of the construction period, and which months of the year are proposed for land clearing, excavation and grading, construction of building and facilities, and landscaping? How does the proposed construction period relate to the seasonal pattern of rainfall, especially the heaviest months?

Source: *Landscape Planning: Environmental Applications*

strive to minimize the negative consequences and potential environmental degradation. The *Comprehensive Medford Area Drainage Master Plan* discusses management techniques for soil erosion and enforcement of drainage system standards. It suggests that the City develop an erosion control guidance document for new development.

Vegetation is critical in controlling soil erosion, particularly on steep slopes. Urban development often leads to removal of natural vegetation, leaving slopes exposed and more susceptible to stormwater runoff and erosion, and more visually barren. Vegetation interrupts raindrops, reducing their force as they hit the soil surface, and roots bind with soil particles, increasing the soil's resistance to the force of running water. Density of vegetation is probably the most important aspect of mitigating soil erosion. The heavier the vegetated cover, the lower the risk of soil loss to runoff.<sup>35</sup>

Specific design and construction techniques can be employed to lessen the impacts of developing on hillsides, such as:

- Adherence to the grading provisions of the *Uniform Building Code* for cuts and fills
- Construction of roads parallel to, rather than perpendicular to contour lines
- Retention of vegetative cover
- Designation of potential landslide areas for low intensity uses
- Use of house plans designed for hillsides

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<sup>35</sup>*Landscape Planning: Environmental Applications*, 2nd Edition, William M. Marsh, 1991.

**NATURAL RESOURCES – SOILS CONCLUSIONS**

1. Medford is located on Class I through IV soil capability types, with the best agricultural soil to the west of the Urban Growth Boundary. Consequently, Medford’s growth is being directed to the east of the city, where greater slopes exist.
2. While the soils characteristic to Medford lend themselves to most types of development, the hillside development trend is increasing soil erosion potential, which can result in polluted runoff and decreased water quality.
3. Unstable ground exists in some areas of east Medford on the slopes of Roxy Ann Peak. Expansive clay soils exist in this area, which can cause structural damage to foundations if not properly constructed.

**NATURAL RESOURCES - SOILS  
GOALS, POLICIES, AND IMPLEMENTATION MEASURES**

See also Policy 12 of the “Urbanization Element.”

***Goal 8: To minimize erosion and hazards relating to slope and soil characteristics by assuring that urban land use activities in Medford are planned, located, and conducted consistently with prevailing soil limitations.***

**Policy 8-A:** The City of Medford shall guide new development, particularly within the foothills, by the soil characteristics and natural features of the landscape, and shall grant development permits only after a determination that potential problems relating to soil limitations, if any, have been identified, and will be adequately mitigated prior to development.

**Implementation 8-A (1):** Continue to actively enforce the provisions of the *Uniform Building Code* (UBC), or adopted equivalent, relating to construction on soils requiring special construction techniques.

**Implementation 8-A (2):** Prepare a hillside development ordinance for consideration by the City Council that requires subdivision and site design to be compatible with, and complementary to, sloping sites, and that preserves appropriate hillside open space and viewsheds.

See also Implementation 2-B (3) of the Southeast Plan section of the “General Land Use Plan Element.”

**Policy 8-B:** The City of Medford shall implement measures to minimize erosion and its resulting water pollution.

**Implementation 8-B (1):** Pursuant to the recommendations of the 1996 *Comprehensive Medford Area Drainage Master Plan*, publish erosion control guidelines in a manual that explains specific objectives to be achieved to aid

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developers and city staff. The manual should recommend erosion controls applicable to Medford's topography, soil types, and climate.

**Implementation 8-B (2):** Review the *Medford Municipal Code*, and propose amendments where necessary to assure that the effects of erosion from development activities on waterways and wetlands are mitigated. Require the use of "best management practices" in site design, grading, and erosion control.

**Implementation 8-B (3):** In foothill developments, require streets and utilities to be located along existing topographic contours wherever possible, and require streets and parking facilities to be kept at the minimum size necessary, to minimize erosion resulting from development activities, and to prevent sediment from entering the storm drainage system.

**Goal 9:** *To assure that future urban growth in Medford occurs in a compact manner that minimizes the consumption of land, including class I through IV agricultural land.*

**Policy 9-A:** The City of Medford shall target public investments to reinforce a compact urban form.

**Policy 9-B:** The City of Medford shall strive to protect significant resource lands, including agricultural land, from urban expansion.

See also Policy 12 of the "Urbanization Element."

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### ENERGY

The primary purpose of this section is to incorporate the significance of energy consumption and the fundamental principles of energy conservation into Medford's planning efforts. It is the intent to show that both the long and short-term benefits of energy conservation, and the use of renewable energy sources, are timely and cost-effective. Almost every aspect of land development affects energy-efficiency, from minute architectural details to broad considerations of urban density.

In 1976, *Goal 13: Energy Conservation* was added to the *Statewide Planning Goals*. This goal states: "*Land, and uses developed on the land, will be managed and controlled so as to maximize the conservation of all forms of energy, based on sound economic principles.*" In addition, the *Oregon Municipal Policy Governing Energy* states "*Cities must provide leadership through the adoption of local laws that encourage energy conservation and the use of alternative, and renewable resources.*"

The League of Oregon Cities suggests that a city's land use policies:

- Encourage clustering of housing and services to avoid unnecessary travel
- Encourage energy efficiency by the vigorous enforcement of up-to-date building codes
- Encourage the use of waste heat recovery from industry
- Encourage the use of solar energy by guaranteeing solar access through appropriate ordinances

Further, the League recommends that "*Cities should develop planning and decision-making processes that relate energy to employment, the environment, urban conservation, and other public priorities.*"<sup>36</sup>

### TRADITIONAL ENERGY SOURCES

Medford, like most cities with limited planning areas, is an energy consumer. Although Medford-specific energy consumption data is not available, it can be assumed that the trends and distributions cited for the state are indicative of energy issues in Medford. About 40% of the energy Oregonians use is for transportation, 35% for industry, 15% for household use, and 10% for commercial, institutional, and other uses. Oil supplies half the energy used in Oregon, although Oregon has no oil resources or refineries. Electricity accounts for more than 20% of total energy used in Oregon; natural gas, less than 20%; and wood and other fuels supply 10%. For residential uses, transportation comprises more than half the energy used by a household, and space/water heating over one-third. The remaining residential energy use is through activities such as refrigeration, cooking, lighting, clothes drying, etc.

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<sup>36</sup>*Report to the League Legislative Committee, Proposed Amendments*, League of Oregon Cities, September, 1996.

## **ENVIRONMENTAL ELEMENT**

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### **Electricity**

In 1995, Oregonians used 45.7 billion kilowatt-hours of electricity. Industry and households each accounted for about 35% of the electricity, and commercial, institutional, and other uses utilized 30%. The electrical power system in Oregon is part of the Bonneville Power Administration's (BPA) regional network. More than half of Oregon's electricity is supplied by the Columbia River hydroelectric power system. Another one-third comes from coal-fired plants; 8% from gas-fired plants, and 3% from a nuclear power plant (Hanford). The BPA serves Oregon's 36 customer-owned and three investor-owned electric utilities. Investor-owned Portland General Electric and Pacific Power provide about 70% of the electricity that utilities supply in Oregon. In Jackson County, Pacific Power is the primary supplier of electricity.

A comprehensive review of the northwest energy system was undertaken in 1996, and recommendations from the review are expected to produce changes in the structure of the region's electrical power industry. New federal and state legislation will most likely follow. Once characterized as a monopoly, the emerging system, which will allow customers to choose their power supplier, will be more competitive, decentralized, and less price regulated. The intent of the review was to allow the northwest to shape the transition of the electrical power industry to assure that the region's natural resources are protected, that costs and benefits of a more competitive marketplace are distributed with greater equity, and that an adequate, efficient, economical, and reliable power system is maintained. In 1998, Portland General Electric and Pacific Power conducted pilot programs to learn how the mechanics of restructuring would work. Some customers were able to choose their supplier based on factors such as price and the environmental impacts of the electricity sources.

### **Natural Gas**

More than 1.3 billion therms of natural gas were used in Oregon in 1995, with about 65% used by manufacturers, 30% used for home water and space heating, and 5% used by commercial, institutional, and other users, primarily for space and water heating. Natural gas in Medford is provided by Avista, one of the three natural gas utilities serving Oregon. Propane and butane, also natural gases, are distributed locally through a variety of independent outlets.

Compressed natural gas (CNG) is being utilized in the Rogue Valley as a cleaner burning alternative for motor vehicles. As noted in the Air Quality section, the Rogue Valley Transportation District operates much of its fleet of buses on CNG, and operates a CNG fueling station in Medford. Other agencies, such as Jackson County are acquiring fleet vehicles that operate on CNG.

### **Petroleum**

Petroleum is available in many forms, including residual oil, distillate oil, gasoline, and diesel fuel. These petroleum products are not supplied by utilities, but through a multitude of private companies, distributors, and retail outlets. Residual oil is used primarily for large-scale commercial and industrial space and hot water heating, and for industrial process heat. Distillate oil is also used primarily for heat generation, though usually for smaller applications such as residential space heating. Gasoline and diesel fuel are used almost exclusively for vehicular purposes, mostly for street and highway transportation.

Of the various petroleum types, gasoline is by far the most heavily relied-upon fuel source, with private transportation consuming the greatest percentage. More than 80% of the oil used in Oregon is for transportation. The rest is used in manufacturing, agriculture, and for space

## ENVIRONMENTAL ELEMENT

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heating. In 1995, Oregonians used more than 2.7 billion gallons of oil products, including gasoline, liquefied petroleum gases, kerosene and jet fuels. Gasoline accounted for more than half the oil use, which increased 18% between 1985 and 1995, similar to population growth.

### ALTERNATIVE ENERGY SOURCES

Consumption of most types of energy, especially petroleum, has created numerous environmental problems in the United States and internationally. The oil crisis of the late 1970s brought alternative energy sources, such as solar, into the mainstream. In the 1980s, however, cheap energy costs and an abundant supply of fossil fuels placed alternative forms of energy on the back burner. Today, the options afforded by alternative energy sources have come to the forefront again, as the safety of nuclear energy is questioned, and the use of coal and petroleum is attributed to air pollution and global warming.

Often, conservation is the most readily available alternative to an increasing dependency on nonrenewable energy, and is one of the major ways to protect the environment. Since 1978, energy savings in Oregon have resulted from a variety of conservation efforts, including requiring energy standards for new buildings and providing state income tax credits, loans, and rebates for energy efficiency improvements. Conservation has also occurred in manufacturing processes and equipment, lighting and heating for schools and governmental agencies, transportation alternatives for commuters, more efficient home appliances, and home weatherization.

In addition to conservation, the City of Medford has several potential sources of renewable energy, including solar and convertible waste. Cogeneration, including waste to energy production, is an area of potential growth. Local wastes that can and are being used for cogeneration purposes include wood slash, agricultural, residential yard, and other biomass wastes. Historically, the reliance on burning wood for space heating purposes was a common practice in Medford and the Rogue Valley. More stringent air quality control measures and the increased use of natural gas and electricity for space heating have significantly reduced reliance on wood heating.



#### Solar Energy

The potential for solar energy use in Oregon is excellent, according to a study by the U.S. Department of Energy. *“Solar energy in Oregon cannot completely replace other fuels for space and/or water heating, but solar systems, both active and passive, can economically provide between 25 and 75 percent of space and/or water heating needs for many homes.”*<sup>37</sup> Southern Oregon, from Grants Pass to the California border, and particularly Medford, has been

identified as having among the best solar energy attributes of any area in the Pacific Northwest. Although Medford has a reputation for being prone to fog, climatological data suggests that the

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<sup>37</sup>Jackson County Comprehensive Plan, Jackson County Planning Department, 1989.

## **ENVIRONMENTAL ELEMENT**

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total number of foggy days in Medford represents only 14% of the year. The state offers a tax credit for homeowners and renters who install solar energy systems for space or water heating.

### **Wind Energy Generation**

Oregon contains areas with significant wind energy generation potential, such as coastal and mountainous areas, where the winds are particularly strong and constant. Studies have shown that with today's technology, a network of wind turbine generators in the state could have a capacity of nearly three times that of Oregon's decommissioned Trojan Nuclear Plant, but at a lower cost. The newest wind generation facility, in Umatilla County, produces up to 24.9 megawatts. Medford's location in the broad floor of an inland valley results in virtually no wind turbine generation potential; however, there are other locations in Jackson County that may be suited to wind energy generation.

### **Convertible Waste Energy**

Jackson County, like the Pacific Northwest, is well-endowed with substantial quantities of convertible wastes from several sources, including forestry, agriculture, municipal sewage, and solid waste. One example of a convertible waste facility in Jackson County is Biomass One, a White City business that produces electricity from wood waste - a clean, viable alternative to traditional waste disposal methods, such as landfills or open burning. Biomass One has a 25-megawatt, woodwaste-fired cogeneration plant that annually converts 355,000 tons of wood waste into steam and electricity. Most clean wood (free of dirt, rock, and metal) or wood-based waste material is accepted. The steam is sold locally for drying lumber and veneer, and the electricity is sold to Pacific Power for distribution to customers in the Rogue Valley. Biomass One produces enough power to satisfy the needs of more than 20,000 homes in the Rogue Valley. Lumber mills, although no longer as plentiful in Medford as they once were, also commonly utilize wood waste for producing energy.

Another example of a local facility that produces energy from waste is Medford's Regional Water Reclamation Facility, which uses cogeneration to generate electricity from waste methane gas. Landfills, such as the regional Dry Creek Landfill located northeast of the Medford UGB, have the potential for similar cogeneration facilities using methane.

## **ENERGY-EFFICIENT DEVELOPMENT PRACTICES**

Land development regulations can promote energy conservation at the community level. Energy-efficient development techniques are wide-ranging in scope, cost, and effectiveness. Passive solar orientation, for example, is a relatively simple, low cost way to reduce the heating and cooling needs of a new building. Utilizing building insulation practices, such as outlined in the Oregon Energy Code, significantly improves the thermal efficiency of structures. Other options are more complex to design and implement, such as using mixed-use development to reduce the number and length of automobile trips.

In addition, reliance on wood products as the primary material in residential construction maintains dependency on a forest products industry that is becoming less able to meet demand, resulting in increased construction costs and reduced home affordability. Over-reliance on wood products may damage remaining forests, including siltation and pollution of streams and rivers, loss of fish and wildlife habitats, and reduced recreation potential. To address these issues, the conservation of this resource through the use of alternative building materials, consistent with safe construction practices, should be encouraged.

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Below is a brief overview of development practices that save energy and address the requirements of State Planning Goal 13.

### **Reducing Heating and Cooling Needs**

The energy required to heat and cool buildings is determined in part by the amount of insulation, and the design of buildings and sites with respect to the climate. Sun, cold winds, warm breezes, vegetation, and topography affect a building's heating and cooling needs, and can be utilized to reduce such needs. The orientation and arrangement of buildings with respect to the sun and wind, and the use of landscaping are examples of actions that can be taken to moderate climate extremes, create a more comfortable living environment, and save energy.

Some options for reducing heating and cooling needs are:

#### **Natural Solar Heating**

- Design developments so that buildings are oriented to the path of the sun. This includes designing streets to run from east to west; the long axis of lots to run from north to south; and the long axis of buildings to run from east to west.
- Develop south-facing slopes. South-facing slopes are warmer in winter than slopes facing other directions.
- Facilitate the use of solar energy systems by assuring that access to sunlight is protected. The arrangement and height of structures and vegetation affects the location of shadows that may block sunlight to solar collectors.

#### **Natural Cooling**

- Use landscaping to shade buildings, parking lots, streets, and other paved areas. This prevents overheating of buildings in summer, and lowers summer air temperatures near the pavement.
- Design developments to take advantage of cooling breezes. The placement of vegetation and the arrangement of buildings can channel breezes through buildings. This is especially effective in areas subject to high summer air temperatures such as Medford.

#### **Wind Protection**

- Use windbreaks (trees, hedges, fences, earthworks) to protect buildings from winter winds. Windbreaks reduce the infiltration of cold air into buildings.
- Arrange buildings so that they protect one another from the wind. Often such an arrangement is compatible with taking advantage of summer breezes, in that winter and summer wind directions differ.

#### **Building Insulation**

- Increase a building's thermal efficiency through use of proven insulation methods.

### **Reducing Private Automobile Transportation Needs**

The amount of energy used to move people and goods in a community is determined in large part by patterns of development. *"The spatial relationships of individual buildings and entire*

## ENVIRONMENTAL ELEMENT

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*neighborhoods - their density and the degree to which different kinds of uses are integrated - determine in part how far and by what means people travel.*"<sup>38</sup> Compact development with a mixture of different land uses, where goods, services, jobs, residences, and recreation are closer together, reduces travel needs and increases the feasibility of public transportation.

Some means to reduce automobile transportation needs are:

### Density

- Develop and re-develop at increased densities, especially near activity centers, public transportation, and in areas with existing sewer, water, and street capacity.
- Use clustering to shorten distances within developments.
- Develop vacant parcels that are located within existing development (urban infill).

### Integrating Uses

- Combine different types of land uses within developments and neighborhoods.
- Develop multiple-use buildings. Large complexes with residential, lodging, entertainment, office, and commercial uses under one roof are an example. This can also be done on a smaller scale - an apartment building with a few shops, for example.
- Provide convenience shopping and service facilities in residential neighborhoods. Convenience stores in residential areas provide an alternative to driving long distances for minor purchases.

### Bicycling - Walking - Public Transit

- Provide facilities that encourage bicycling and walking. Walkways, landscaping, and other amenities can encourage people to walk or bicycle.
- Locate higher density residential development near existing public transportation. Provide amenities and facilities that encourage public transportation use, such as shelters for waiting and walkway connections from residential areas.

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<sup>38</sup>*Energy-conserving Development Regulations: Current Practices*, Report Number 352, American Planning Association, August, 1980.

**NATURAL RESOURCES – ENERGY CONCLUSIONS**

1. Medford is an energy consumer rather than an energy producer, utilizing primarily imported, nonrenewable energy sources, with the greatest share used for transportation.
2. Conservation is the most readily available and cost effective alternative to the increasing dependency on non-renewable energy sources.
3. Of the possible local sources of renewable energy, solar energy has the greatest potential for supplying a portion of Medford’s energy needs, particularly residential needs, because it is cost effective and locally abundant.
4. Other renewable energy sources in the region include cogeneration from convertible waste, such as woodwaste and methane, which produce electricity and steam. The City of Medford’s Regional Water Reclamation Facility produces electricity from methane gas.
5. The City of Medford requires new construction to comply with standards set forth in the Oregon Energy Code.

**NATURAL RESOURCES - ENERGY  
GOALS, POLICIES, AND IMPLEMENTATION MEASURES**

*Goal 10: To assure that urban land use activities are planned, located, and constructed in a manner that maximizes energy efficiency.*

**Policy 10-A:** The City of Medford shall plan and approve growth and development with consideration to energy efficient patterns of development, utilizing existing capital infrastructure whenever possible, and incorporating compact and urban centered growth concepts.

**Implementation 10-A (1):** Ensure that the extension of urban services is consistent with policies contained in the “Public Facilities Element” of the Medford *Comprehensive Plan* regarding energy efficiency.

**Implementation 10-A (2):** Develop a design manual showing examples of energy conservation in subdivision planning, site layout, landscaping and building design.

**Implementation 10-A (3):** Provide examples for developers to follow which reduce motor vehicle transportation needs by using mixed uses, urban infill projects, etc.

**Policy 10-B:** The City of Medford shall encourage energy conservation, including the adoption and implementation of programs leading to improved weatherization/insulation of new and existing structures.

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**Implementation 10-B (1):** Continue to participate in residential and non-residential weatherization programs.

**Policy 10-C:** The City of Medford shall encourage the use of energy efficient building materials and techniques in new public and private construction and remodeling, in accordance with building safety standards.

**Policy 10-D:** The City of Medford shall encourage the use of solar energy, recognizing it as a viable alternative to traditional energy sources.

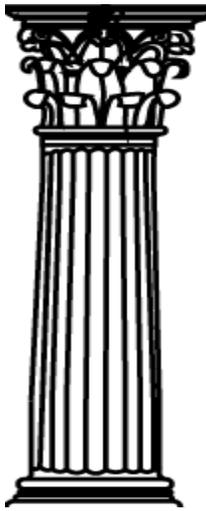
**Implementation 10-D (1):** Develop for consideration by the City Council, amendments to the *Land Development Code* that require consideration of passive solar energy techniques in subdivision design, including house orientation, street and lot layout, vegetation and protection of solar access.

**Policy 10-E:** The City of Medford shall strive to make all city facilities and operations as energy efficient as possible.

**Implementation 10-E (1):** Continue to utilize opportunities for cogeneration technology in public facilities.

**Implementation 10-E (2):** Investigate the conversion of the city-owned vehicle fleet to use alternative fuel sources such as compressed natural gas and electricity.

## ARCHAEOLOGICAL AND HISTORIC RESOURCES



This section of the “Environmental Element” discusses Medford’s archaeological and historic resources, and presents the pertinent Conclusions and Goals, Policies, and Implementation Measures.

In addition to natural resources, archaeological and historic resources are required to be addressed and inventoried in comprehensive plans by Goal 5 of the *Statewide Planning Goals*. State law defines *archaeological areas* as those “characterized with evidence of an ethnic, religious, or social group with distinctive traits, beliefs, and social forms”; and defines *historic areas* as “lands with sites, structures, and objects that have local, regional, statewide, or national historical significance.” An example of a historic resource with national significance located in the Medford area is the Applegate Trail, which was an alternate route along the Oregon Trail that brought 45,000 emigrants to Oregon in the 1800s. The Applegate Trail is designated as a National Historic Trail.

A strong commitment to archaeological and historic preservation exists at the federal, state, county, and local levels. In Oregon Revised Statute 358.605, the state legislature makes the following findings:

*“The Legislative Assembly declares that the cultural heritage of Oregon is one of the state's most valuable and important assets; that the public has an interest in the preservation and management of all antiquities, historic and prehistoric ruins, sites, structures, objects, districts, buildings, and similar places, and things, for their scientific and historic information, and cultural and economic value; and that the neglect, desecration, and destruction of cultural sites, structures, places, and objects results in an irreplaceable loss to the public.*

*The Legislative Assembly finds that the preservation and rehabilitation of historic resources are important as a prime attraction for all visitors; that they help attract new industry by being an influence in business relocation decisions; and that rehabilitation projects are labor intensive, with subsequent benefits of payroll and energy savings, and are important to the revitalization of deteriorating neighborhoods and downtowns.*

*It is, therefore, the purpose of this state to identify, foster, encourage, and develop the preservation, management, and enhancement of structures, sites, and objects of cultural significance within the state in a manner conforming with, but not limited by, the provisions of the National Historic Preservation Act of 1966.”*

## PREHISTORIC RESOURCES

While there is a high probability that prehistoric resources exist within the Medford Urban Growth Boundary (UGB), little is known about their exact locations. Historically, the lower Bear Creek Valley was inhabited by the Upland Takelma Native American Tribe. Prehistoric resources are likely to be found near Bear Creek, above the normal winter flood levels. This area has been somewhat protected from disturbance due to the city’s Riparian Corridor Ordinance district and Jackson County’s Bear Creek Greenway. Much of the Bear Creek Greenway is

## ENVIRONMENTAL ELEMENT

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already in public ownership, particularly outside the city's core. The little archaeological survey work completed in the Medford UGB is primarily the result of public facility and road construction. Most identified prehistoric sites in the general vicinity are located outside the UGB.

### ARCHAEOLOGICAL ISSUES IN DEVELOPMENT

Since available information indicates the existence of archaeological resources, but is currently inadequate to identify the location, quality, or quantity of the resources, the inventory of such resources required by Goal 5 can be postponed. According to Goal 5, however, the City must express its intent, through plan policies, to address such resources in the future, including a time-frame for this review. Special implementing measures are not appropriate nor required until adequate information is available to enable review and adoption of such measures.

Development of land in the Medford UGB could disturb surface or subsurface archaeological resources. Pursuant to Oregon state law, a person may not knowingly and intentionally excavate, injure, destroy, or alter a prehistoric site or object, or remove an archaeological object from private lands, unless that activity is authorized by a state permit. State guidelines strongly recommend that those considering development on previously undisturbed private lands contact the Oregon State Historic Preservation Office (SHPO) and the appropriate Native American tribes to determine whether archaeological sites and/or objects are likely to be present. This contact reduces the chance that a project will be delayed due to discovery of archaeological resources. Before excavating a known site or removing objects, a person is required to satisfy the state archaeological permit process. The requirements differ slightly if the actions are to occur on public rather than private land.

For development on private land, permits are **not** required for the following:

- For exploratory excavation to determine the presence of an archaeological site;
- For those persons who unintentionally discover an archaeological object exposed by the forces of nature, and who retain the object for personal use, except sacred objects, human remains, funerary objects, or objects of cultural patrimony; and,
- For collecting of an arrowhead from the surface of private land, if collecting can be accomplished without the use of any tool.

In state law, an archaeological site is defined as a “*geographic locality that contains archaeological objects and the contextual associations of those objects with each other, or with biotic or geological remains or deposits.*” Examples of archaeological sites include shipwrecks, lithic quarries, house pit villages, camps, burials, lithic scatters, homesteads, and town sites. An archaeological object or artifact is defined as an “*object that is at least 75 years old, comprises the physical record of an indigenous or other culture, and is the material remains of past human life or activity that has archaeological significance.*” Examples of archaeological objects include monuments, symbols, tools, facilities, technological by-products, and dietary by-products. Excavation is defined as “*breaking the ground surface to remove any artifact, or to remove an embedded artifact, feature or non-artifactual material in an archaeological site for the purposes of anthropological research.*”

### HISTORIC RESOURCES

The archaeological record is a continuum that includes materials from prehistoric and historic times. There are many potential historic archaeological sites within the Medford UGB. Under Goal 5 and its implementing Oregon Administrative Rules, OAR 660-23-200, comprehensive plans must foster and encourage the preservation, management, and enhancement of significant historic resources. State law requires the city to designate “significant” historic resources, and protect them through local review of proposed exterior alterations and demolitions. Such regulation must occur through adopted land use ordinances. Historic resources can be buildings, structures, objects, districts, or sites. Designation is a decision by the city declaring that a historic resource is significant. A historic resource listed on the National Register of Historic Places (National Register) or located within a National Register historic district is considered to have “statewide significance.” The city must protect historic resources having statewide significance whether or not they have been officially “designated” by the city. In addition, the state, counties, cities, school districts, and other governmental units owning historic resources are required to conserve such resources, and assure that they are not inadvertently transferred, sold, substantially altered, or allowed to deteriorate. Many of Medford’s significant historic resources are under such public ownership.

### FEDERAL AND STATE HISTORIC PRESERVATION PROGRAMS

Listing on the National Register of Historic Places honors properties significant in local, state, or national history. The Oregon SHPO manages the nomination process, and, although anyone can submit a nomination, properties cannot be listed without the consent of the owner. In the case of historic districts, if a majority of owners object, the nomination will not proceed. The SHPO also provides technical assistance and advice on matters concerning prehistoric and historic resources regardless of their designation status. The SHPO administers several tax incentive programs that are available to National Register properties. Within historic districts, all properties deemed to contribute to the historic character of the district are potentially eligible for these benefits.

One program, the Special Assessment of Historic Property, offers a fifteen-year “freeze” of the assessed value of a property if interior and exterior rehabilitation meeting certain standards occurs. See **Figure 11** for the state policy regarding Special Assessments. Fully depreciable properties, generally commercial properties and residential properties in which the owner does not reside, are eligible for a second fifteen-year term if seismic reinforcement, energy code, or Americans with Disabilities Act (ADA) compliance measures that respect the historic character of the building are undertaken.

Properties with special assessments must be open for public viewing one day each year, and they must display a plaque identifying the property as historic and receiving a public benefit. The Medford City Council reviews applications for the special assessment program relative to the public benefit, and makes recommendations to the SHPO. In 1997, 49 historic properties in the City of Medford were participants in this program. A second incentive program, the Federal Historic Rehabilitation Tax Credit, is available only to fully depreciable buildings. It offers an income tax credit equal to 20 % of the cost of qualifying rehabilitation work over a five-year period.

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### HISTORIC PRESERVATION ORDINANCE

The City of Medford acknowledged the importance of historic preservation by adopting a Historic Preservation Ordinance in 1986. The ordinance created a Historic Preservation Overlay, and provided for Historic Review of proposed exterior alterations and demolitions in designated historic areas by a Historic Commission.

### Figure 11 Special Historic Assessments

O.R.S. 358.475 Policy

The Legislative Assembly hereby declares that it is in the best interest of the state to maintain, preserve and rehabilitate properties of Oregon historical significance. Special assessment provides public benefit by encouraging preservation and appropriate rehabilitation of significant historic properties. These historically significant portions of the built environment contain the visual and intellectual record of our irreplaceable cultural heritage. They link us with our past traditions and values, establish standards and perspectives for measuring our present achievements and set goals for future accomplishments. To the extent that Oregon's special assessment program encourages the preservation and appropriate rehabilitation of significant historical property, it creates a positive partnership between the public good and private property that promotes economic development; tourism; energy and resource conservation; neighborhood, downtown and rural revitalization; efficient use of public infrastructure; and civic pride in our shared historical and cultural foundations.

### The purposes of Medford's Historic Preservation Overlay are to:

- Affect and accomplish the protection, enhancement, perpetuation, and improvement of such buildings, structures, objects, sites, and districts that represent elements of Medford's cultural, social, economic, political, or architectural history;
- Safeguard Medford's historic, aesthetic, and cultural heritage as embodied in such buildings, structures, objects, sites, and districts;
- Complement the *National Historic Preservation Act* and *National Register of Historic Places* designations;
- Stabilize and improve property values of such buildings, structures, objects, sites, and districts;
- Foster civic pride in the beauty and noble accomplishments of the past;
- Protect and enhance Medford's visitor and tourist attractions, and support and stimulate business and industry;
- Promote the use of such buildings, structures, objects, sites, and districts for the education, pleasure, and public welfare of the residents of Medford;
- Further the provisions of *Statewide Planning Goal 5*; and,
- Implement and supplement the *Medford Comprehensive Plan*.

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### **The primary duties of the Medford Historic Commission are to:**

- Review and investigate any historic resources in the City of Medford that may have historic significance, and initiate proceedings and consider applications to adopt or remove Historic Preservation Overlays.
- Consider proposed exterior alteration and/or new construction within Historic Preservation Overlays.
- Consider proposed demolitions or relocations within Historic Preservation Overlays, and authorize either delayed or immediate issuance of a demolition or relocation permit.
- Study proposed *Comprehensive Plan* and *Land Development Code* amendments relating to historic preservation, and submit recommendations regarding such proposals to the Planning Commission and City Council.
- Institute and support programs and projects that further the historic policies of the City of Medford.

## HISTORIC DESIGNATION

Many of the significant historic resources within the city (the “1-A” inventory) were placed within the Historic Preservation Overlay early in 1987. These properties are on the National Register, and most are also under the special assessment program. A number of additional properties were approved by the City Council in 1995 for designation. A list of “potentially significant” historic resources in the city (the “1-B” inventory) was compiled in 1982 by a subcommittee of the Citizens Planning Advisory Committee (CPAC). The 1-B resources required additional evaluation to determine significance. In 1995, some of the 1-B resources were also approved for designation. An inventory of Medford’s historic resources is contained in **Appendix B**.

Changes to state law in 1995 required that property owners be permitted to refuse local designation as a significant historic resource anytime before adoption by the local decision-making body, and be permitted to remove their property from local designation. A revised Historic Preservation Ordinance for the City of Medford is proposed to address the changes in state law, as well as to clarify the review process.

### **Medford’s Historic Preservation Overlay finds that a historic resource has significance if it:**

- Is associated with a person, group, organization, or event that made a significant contribution, or is illustrative of the broad patterns of cultural, social, political, economic, or industrial history of the city, region, state, or nation; or,
- Retains sufficient original design, craft work, or material in its original setting to serve as an example of a particular architectural period, building type, or style having design or artistic quality; or,

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- Is a rare or unique surviving example of a development type, architectural style, or structural type significant to the city's history; or,
- Significantly contributes to the historic character, identity, and continuity of the street, neighborhood or city, or is a visual landmark; or,
- Represents a noteworthy work of a developer, architect, builder, or engineer noted in the history or architecture of the region; or,
- Significantly contributes to the character and identity of a grouping (ensemble) of resources that, together, share a distinct and intact historic identity.

## **HISTORIC REVIEW**

State law requires the city to evaluate “conflicting uses” relating to significant historic resources. The most common conflicting uses are typically either improper exterior alterations or demolition of the resource. Medford’s Historic Preservation Ordinance addresses the issue of conflicting uses through the required review of proposals for alteration or demolition in designated historic areas by the Medford Historic Commission. The ordinance provides general criteria to be used in this review process; however, preparation of design guidelines for the Historic Preservation Overlay would provide property owners and the Historic Commission with additional guidance to achieve consistency and predictability in the review process. Such guidelines, if prepared, should be consistent with the *Secretary of the Interior’s Standards for Rehabilitation*.

## **HISTORIC RESOURCES IN MEDFORD**

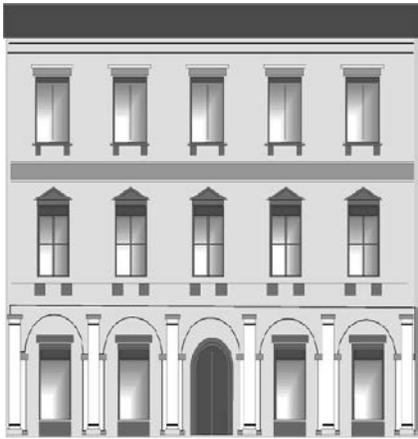
In addition to the many individual properties in the city on the National Register, four historic districts have been formed and listed on the National Register. These are described below.

### **South Oakdale Historic District**

The South Oakdale Historic District, which was on the city’s original 1-A inventory of significant historic resources, was entered on the National Register in 1979. The area predominantly consists of well-maintained historic homes on both sides of South Oakdale Avenue, between West Tenth Street and Stewart Avenue. The district contains 60 individual parcels of land. The oldest home is from 1884, and 26 homes have historic significance. The 1931 Art Deco-style Medford Senior High School building (now South Medford High School) and the 1928 Romanesque Revival-style Sacred Heart Catholic Church are also included in the District.

### **Geneva-Minnesota Historic District**

The Geneva-Minnesota Historic District was listed on the National Register in 1993. This district consists of 34 homes constructed between 1911 and 1924, primarily of the Craftsman, Bungalow, and Period Revival styles. It represents one of Southern Oregon’s most intact early 20th century residential areas, including a unique roadbed on Geneva Street, and original raised-concrete retaining walls along both Geneva and Minnesota Streets. The roadbed is paved with a surface made of cement slurry mixed with crushed rock referred to as “hassam” that has endured since 1911. A cobblestone-like design was impressed onto the surface.



### **Medford Downtown Historic District**

The Medford Downtown Historic District was listed on the National Register in 1998. Downtown Medford, the historic commercial core of the city, contains many historic properties that provide some of the city's most attractive urban features. A historical survey was conducted in two phases in 1994-1995 in preparation for creation of the Historic District. The survey is reported in a document entitled *Survey of Historic and Cultural Resources, City of Medford, Oregon, Downtown Commercial Area* which was funded in part by state and federal historic preservation grants

A 1993 document, *Medford, Oregon: Historic Context 1846-1946*, provided the historic framework for the analysis and evaluation of the identified resources in the survey. The Historic Context document was produced by the City of Medford in conjunction with the Southern Oregon Historical Society and the Oregon SHPO. It identified the top priority for survey/inventory work in Medford as the "Original Town" area, which comprises the historic commercial core and surrounding neighborhoods. It noted that commercial development and road expansions, as well as inappropriate remodeling, are the primary threats to the older neighborhoods in Medford.

The Medford Downtown Historic District is bounded by Riverside Avenue, Fourth Street, Oakdale Avenue, and Eighth/Ninth Streets, including more than 35 blocks with 193 structures or sites. Although predominantly commercial, the district also contains numerous residential structures, evidence of its past and continuing mixed-use nature. All structures built within the historic period (1884-1948) were documented in the downtown commercial area survey. Such surveys rank resources as "primary," "secondary," or "non-contributing." Those ranked as primary (having high significance and integrity, and a substantial role in the historic landscape) were approved by the City Council in 1995 for addition to the 1-A inventory.

The district falls within Medford's "City Center" *Comprehensive Plan* designation, and within the Central Business (CB) overlay zoning district. According to the Medford *Land Development Code*, the purpose of the CB overlay is to "*recognize the unique and historic character of the downtown area as an asset to the community, and to provide standards and criteria necessary for its continued development and redevelopment as a vital part of this community.*" A plan prepared in 1994 for Medford's downtown, the *Downtown City Center Vision Plan*, found that the:

*"Downtown City Center should be enhanced and developed in a manner that places*

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*priority on its older architecture. These structures give the area its visual uniqueness, and must be valued as an economic resource - their visual appeal can, and should, be used to attract tenants and users to the downtown city center. This emphasis on preservation is critical in the downtown central district... As new infill development and redevelopment is completed in each of the (downtown) districts, the new construction should be undertaken with a sensitivity and respect for the existing historic fabric of the downtown city center."*

The accompanying *Medford City Center Design Concept* document states that:

*"Respectful rehabilitation of the architectural fabric of the City Center should be encouraged. Downtown Medford possesses great built resources that reflect several economic booms, several stylistic periods, and represent the work of significant local architects. (New) treatments should respect the traditional organizing characteristics of later 19th and early 20th Century commercial retail buildings."*

In response to these studies, the Medford Urban Renewal Agency has begun the process of establishing design guidelines for the downtown, which extends beyond the boundaries of the Historic District, to further regulate building alterations and new construction. These guidelines would assist in the city's Site Plan and Architectural Review and Historic Review processes by assuring that alterations and new construction within the downtown are compatible with the existing historic character. Often a hodgepodge of incompatible facades exist within a single block.

### **Hillcrest Orchard Historic District**

The Hillcrest Orchard Historic District is located in a 240-acre block of land that is entirely surrounded by the Medford UGB, although outside the UGB. It was placed on the National Register in 1984. One of the oldest local orchards, the first fruit trees were planted in 1897, although most of the buildings were built between 1917 and 1926. The historic district encompasses a complex of Period Colonial-style buildings that include a main house, barns, packing house, office, wagon shed, garages, guest house, tennis courts, and a recreation building with an indoor pool. The complex was built to serve as the summer home of the Parsons family, who bought the orchard in 1908. Most of the buildings were designed by Frank Clark, who continued on to design many of the Bear Creek Valley's distinctive homes and buildings. The orchard continues to be a commercial farm producing a variety of pears. Due to its location outside the Medford UGB, this historic district is not subject to Medford's Historic Preservation Ordinance.

### **OTHER HISTORIC RESOURCES**

The Historic Context document identified a number of other historic interest areas outside the "Original Town" area of Medford, such as the "Old East Side" and "Siskiyou Heights." The architecture represented in these areas includes Vernacular, Queen Anne, Period Tudor, Italianate, Spanish Colonial, Bungalow/Craftsman, and Period Colonial Revival styles. Streets such as Queen Anne Avenue, Oregon Terrace, East Main Street, Berkeley Way, and Reddy Avenue contain many of the city's residential historic resources. Additional single sites are scattered throughout the city in areas that were once agricultural, such as on Kings Highway south of Stewart Avenue. There are other significant historic resources located in the Medford UGB, but outside the present city limits, such as the Bear Creek Orchards Packing House on

## **ENVIRONMENTAL ELEMENT**

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South Pacific Highway and the Oak Grove School on Jacksonville Highway. Resources having primary historic significance are also located in the city's Prescott Park, which is on Roxy Ann Peak. Although under the city's ownership, the park is immediately outside the Medford UGB. The historic park facilities, which include a spring house, picnic shelter, and restrooms, were constructed in 1936 by the Civilian Conservation Corps (CCC).

A county wide property tax base (Historical Fund) provides funds utilized throughout the county to support historic preservation efforts and museums. The Southern Oregon Historical Society, located in the Southern Oregon History Center in downtown Medford, is one of the larger historical organizations in the county. The History Center is located in a historic building, the 1948 Moderne style J. C. Penney's Building, which was occupied by the retailer for 38 years.

**ARCHAEOLOGICAL AND HISTORIC RESOURCES CONCLUSIONS**

1. A commitment to archaeological and historic preservation exists at the federal, state, county, and local levels.
2. There is a probability that the Medford Urban Growth Boundary contains archaeological resources; however, current information is inadequate to identify the location, quality, and quantity of the resources. Special implementing measures are not appropriate or required until adequate information is available to enable review and adoption of such measures.
3. Development of land in the Medford Urban Growth Boundary that has been vacant or in agricultural use could disturb surface or subsurface archaeological resources.
4. Medford has categorized inventoried historic resources as those designated as significant (1A), and those that have not been designated, but are potentially significant (1B).
5. There is a probability that the Medford Urban Growth Boundary contains significant historic resources. To more fully protect these resources, survey of the remainder of the Urban Growth Boundary is needed, to evaluate whether additional sites should be designated as significant or potentially significant.
6. Medford’s Historic Preservation Ordinance and Overlay aid in preserving and protecting significant historic resources from inappropriate exterior alterations or demolition through required review of such proposals by the Medford Historic Commission.

**ARCHAEOLOGICAL AND HISTORIC RESOURCES  
GOALS, POLICIES, AND IMPLEMENTATION MEASURES**

*Goal 11: To preserve and protect archaeological and historic resources in Medford for their aesthetic, scientific, educational, and cultural value.*

**Policy 11-A:** The City of Medford shall strive to identify and preserve archaeological resources and sites, and promote actions to prevent intentional and unintentional disruption or destruction of such resources.

**Implementation 11-A (1):** When adequate information becomes available to identify the location, quality, and quantity of Medford’s archaeological resources, prepare an inventory. Special implementing measures are not appropriate or required until adequate information is available to enable review and adoption of such measures.

**Implementation 11-A (2):** Where probable cause for discovery of cultural or archaeological resources exists, such as indicated by a records search, or where resources have been discovered near the project site, encourage sponsors of development projects to contact the Oregon State Historic Preservation Office.

**Implementation 11-A (3):** When cultural or archaeological resources, as defined by state law or the state archaeologist, are discovered during clearing, grading, or

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construction in the city, require project operations to cease until the state archaeologist is contacted, as required by state law.

**Policy 11-B:** The City of Medford shall encourage and facilitate the preservation of Medford's significant historic resources by continuing to update and implement the Historic Preservation Ordinance in the *Land Development Code*.

**Implementation 11-B (1):** Regularly assure that city staff, such as the Planning and Building Safety Departments, are aware of historic preservation ordinances and policies, and provide training for staff in departments directly involved with historic structures.

**Implementation 11-B (2):** Evaluate the zoning of significant historic resources to determine if conflicts are likely based on the present use and/or permitted and conditional uses. Review the zoning of historic districts to determine if the zoning district standards, such as setbacks, density, public improvement design, parking, lot size, etc., are compatible with the historic character of the historic districts.

**Implementation 11-B (3):** Assure that new development located adjacent to historic resources and/or districts is reviewed for compatibility with the historic resources.

**Implementation 11-B (4):** Review proposed public development or improvement projects for their effect on any historic resources.

**Implementation 11-B (5):** Prepare a written yearly report for the Planning Commission and City Council of the activities of the Medford Historic Commission, such as grant activity, surveys, hearings, special assessments, and new site designations and listings.

**Implementation 11-B (6):** Identify and evaluate historic resources on city-owned or controlled properties, and prepare historic preservation plans where appropriate. Identify underutilized historic buildings or sites for potential reuse as public facilities.

**Policy 11-C:** The City of Medford shall continue to maintain an official inventory of significant historic resources located in the city where the Historic Preservation Overlay of the *Land Development Code* applies.

**Implementation 11-C (1):** Include in the Historic Preservation Overlay, all properties in the city listed on the *National Register of Historic Places*, including all properties within National Register historic districts.

**Policy 11-D:** The City of Medford shall support and promote seismic retrofit of vulnerable historic buildings, as well as modification of historic buildings for accessibility to disabled persons.

**Policy 11-E:** The City of Medford shall continue to recognize the downtown City Center as the historic core of the city, and its historic attributes shall be a factor when developing programs for the downtown area.

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**Implementation 11-E (1):** Prepare and implement design guidelines for Site Plan and Architectural Commission and Historic Commission review of properties in the downtown to assure that exterior alterations and new construction are compatible with the historic character. (See the “Facade Treatment Recommendations” of the 1994 *Medford City Center Design Concept* for an example.)

**Policy 11-F:** The City of Medford shall continue to encourage historic preservation efforts and cooperate with citizens and organizations undertaking such efforts.

**Implementation 11-F (1):** Continue to apply for historic preservation grants to carry out survey and inventory work, and support the grant applications of others when affecting property in the Medford Urban Growth Boundary.

**Implementation 11-F (2):** Investigate development of an awards program for exemplary rehabilitation of historic buildings.

**Implementation 11-F (3):** Investigate the concept of a historic easement program.

## **DISASTERS AND HAZARDS**

This section of the “Environmental Element” discusses potential disasters and hazards in Medford, *including natural and human-caused*, and the city’s emergency management efforts, and presents the conclusions, goals, policies, and implementation strategies pertinent to these factors.

### **EMERGENCY MANAGEMENT PLANNING**

The City of Medford has an *Emergency Operations Plan* (EOP) to guide efforts in mitigating, preparing for, responding to, and recovering from major emergencies and disasters. The EOP is part of a *Comprehensive Emergency Management Program* that coordinates federal, state, and local governmental agencies in an operating partnership. The responsibility for maintaining the EOP is borne by the city’s Emergency Management Coordinator through the Emergency Management Planning Team. The Coordinator is responsible for all emergency planning activities, including periodic reviews of the Plan, planning and conducting disaster training exercises, coordinating mitigation efforts, and assisting in acquisition of state and/or federal assistance for these efforts.

All disaster mitigation and preparedness activities are coordinated by the Emergency Management Planning Team, which consists of the City Manager and various department heads, including the Fire Chief, Police Chief, Public Works Director, Building Safety Official, and the Emergency Management Coordinator. The City of Medford’s primary Emergency Command Center (ECC) is located in the City Hall Lausmann Annex at 200 South Ivy Street, with a backup ECC located at the County Emergency Operations Center at 400 Pech Road. The city responds to disasters within the city, within Medford Rural Fire Protection District #2, and at other city-owned facilities when the response will benefit the City.

Mitigation and preparedness planning include advance preparations to minimize public risk from potential disasters, to reduce the likelihood of a major emergency or disaster, and to reduce the anticipated damage. Mitigation can reduce loss of life and property damage through land use regulations and construction practices. Identifying the types, magnitude, and probability of hazards to which an area is susceptible over a significant length of time (hazard risk analysis) is necessary, as well as assessing the degree of hazard risks that the jurisdiction finds acceptable. The cost of mitigating certain risks may be more than a community can afford. Risk standards should be formally adopted as public policy by the local legislative body through comprehensive planning, land development ordinances, permit review, and fire/building safety codes.

### **NATURAL DISASTERS AND HAZARDS**

Goal 7 of the *Statewide Planning Goals*, “Areas Subject to Natural Disasters and Hazards,” requires land use planning in Oregon to consider known areas of natural disasters and hazards. It requires plans to be based on an inventory of such natural hazard areas. Although one of the State of Oregon’s main focuses is on flooding, there are a number of additional natural hazards that have the potential to disrupt life and commerce in Medford, including earthquakes and wild-land urban interface fires, volcanic eruptions, severe weather, emerging infectious diseases, air quality, and landslides. (Air quality and landslides were discussed previously under “Air Quality” and “Soils.”)

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The natural hazards identified and summarized in this section are thoroughly inventoried and analyzed in the *2017 Medford Natural Hazards Mitigation Plan* which was adopted by City Council in September 2017, and is hereby incorporated by reference into the Comprehensive Plan. The City adopted its first *Natural Hazards Mitigation Plan* in 2004 and updated it in 2010. The *2017 Medford Natural Hazards Mitigation Plan* has been reviewed and approved by the Oregon Office of Emergency Management (OEM) and the Federal Emergency Management Agency (FEMA). As a result of those approvals the City is eligible to receive pre- and post-disaster mitigation funds from FEMA.

### FLOODING

Over the past 50 years, major floods occurred in the Rogue Valley in 1955, 1962, 1964, 1974, and, more recently, in 1997. These floods threatened public health, safety, and welfare by destroying or isolating structures, disrupting transportation systems, polluting water supplies, and destroying basic public facilities, such as sewerage and electric services. Recent incidences of record rainfall and flooding across Oregon have renewed concerns about the potential for flooding in the Medford UGB, and have rekindled interest in preparing for potential floods. To minimize the hazards posed by floods, the City of Medford should continue to implement the recommendations of the *Comprehensive Medford Area Drainage Master Plan* and the *2017 Medford Natural Hazards Mitigation Plan* through revisions to Medford's *Comprehensive Plan* and *Land Development Code*, in addition to implementing state and federal regulations.

#### Floodplain Mapping

The sale of federal flood insurance in Medford, through the *National Flood Insurance Act of 1968*, was authorized in 1974. The Federal Emergency Management Agency (FEMA) developed a 100-year or *base flood* for use in mapping floodplains as part of the national flood insurance program. Federal law requires the first floor of a new building to be *at* or *above* the 100-year flood level, while Oregon law is more restrictive, requiring the first floor of a new building to be one foot *above* the line. Stricter development restrictions can be imposed by cities and counties, such as zoning restrictions that limit vulnerable land uses in floodplains, and programs developed to inform property owners of the hazards posed by waterways. Specialists in natural hazards planning note that the 100-year designation is only a tool, and does not guarantee that flooding will occur only within this floodplain designation.

Floodplains can be delineated according to topography, vegetation, soils, or the extent of past floods.<sup>39</sup> When defined according to geomorphic features, the floodplain includes the low-lying land along the stream, the outer limits of which may be marked by steep slopes or valley walls. See **Figure 12** for a graphic representation of a floodplain as defined by FEMA. The *regulatory floodway* is the lowest part of the floodplain where most frequent flood flows occur. This area is not eligible for federal flood insurance. The *floodway fringe* is the area that would be lightly inundated by a 100-year flood, and is eligible for flood insurance if flood proofing has been undertaken. Of all the features of a river valley, the floodplain is the most important from a planning standpoint for three reasons. First, excluding the stream channel itself, the floodplain is the lowest part of the stream valley, and consequently, prone to flooding. Second, floodplain soils are often poorly drained because of the high water tables and saturation by flood waters.

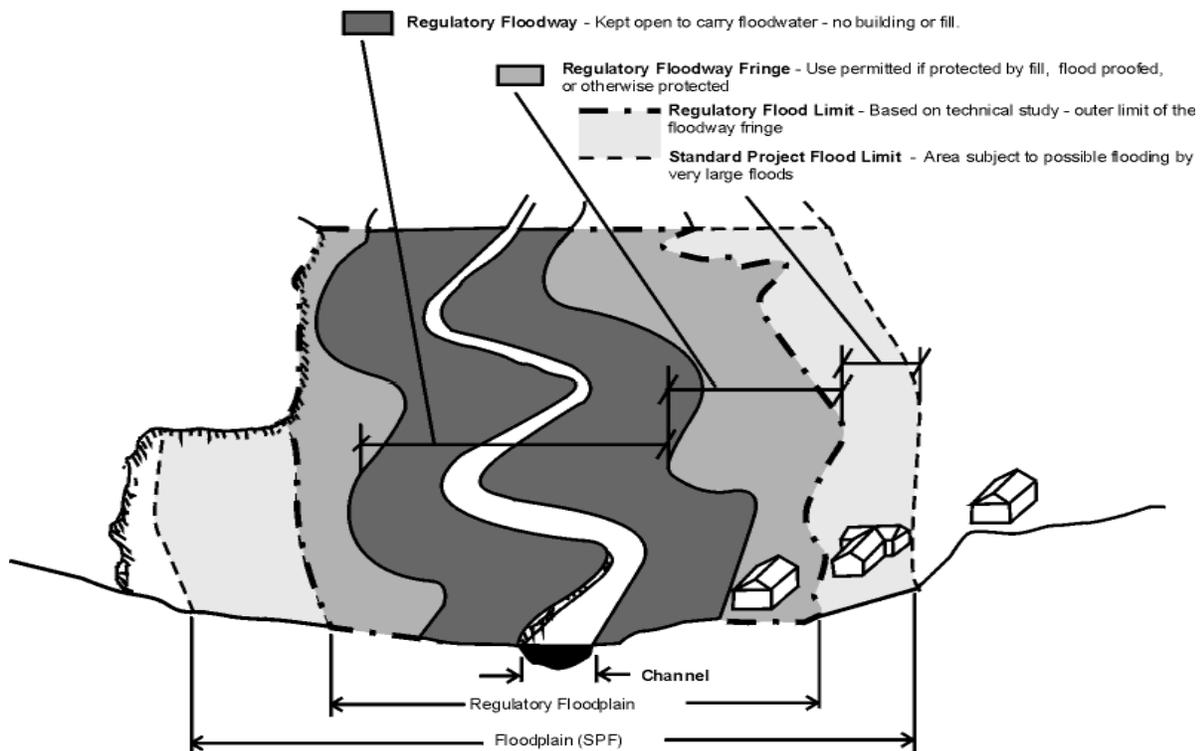
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<sup>39</sup>*Landscape Planning: Environmental Applications*, William M. Marsh, 1991.

## ENVIRONMENTAL ELEMENT

Third, floodplains are formed by incremental erosion and deposition that accompany the meandering of streams through valleys.

As a prerequisite to obtaining federal flood insurance, the City of Medford was required to identify flood hazard areas, and to control development in floodplains. In Medford, flood hazard areas are located along Bear Creek and most other waterways. Federal Insurance Rate Maps (floodplain maps) are available in the Medford Planning Department. In 1974, the City Council established a review process to assure that proper construction methods and utility locations were undertaken in flood hazard areas. For example, new and replacement water and sanitary sewer systems are required to be designed to minimize or eliminate the infiltration of flood waters into the systems, and discharge from the systems into flood waters.



**Figure 12**  
**U.S. National Flood Insurance Program**  
**100-Year Floodplain**

Source: *Landscape Planning: Environmental Applications*, 2nd Edition, William M. Marsh, 1991.

While floodplain maps are helpful, Oregon's short recorded weather history and changing climatic conditions make flood estimating unpredictable. Additionally, the state's expanding population and fast rate of development continue to alter the landscape and natural waterways.<sup>40</sup> As a result, many floodplain maps are outdated. A FEMA expert noted in a 1997 *Oregonian* article, that many watersheds in Oregon have changed since floodplains were mapped, and, that "(n)ew houses and pavement in the place of fields and woods mean quicker runoff into streams. 'We're seeing a lot more urban flooding than was occurring in past decades.'"

<sup>40</sup>Ibid.

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Medford is similar to many Northwest communities located in valleys prone to flooding that were formerly used for agriculture. As the FEMA expert noted, “*Many streams in rural areas weren’t seen as priorities when maps were being drawn and weren’t included in the studies. Now communities have sprouted on former pastures. In addition to areas that need to be restudied, there are many areas that we have not yet studied at all. So just because you don’t live in an area that we say is subject to a 100-year flood, it may mean that we haven’t gotten around to studying it.*”<sup>41</sup> The State of Oregon has requested that FEMA place a high priority on updating Oregon’s floodplain maps.

### **Flood Damage Reduction**

The City of Medford is one of the few Oregon communities to take part in the Community Rating System (CRS) program, which is intended to aid in reducing flood losses, to facilitate accurate insurance ratings, and to promote awareness of flood insurance. The program provides flood insurance premium discounts as an incentive for cities to develop extra flood protection measures beyond what the national program requires. Communities can qualify for up to a 45% discount. The discount is based on a point system. A high number of additional points can be earned through such activities as collecting and maintain flood data, protecting open space, stormwater management, higher regulatory requirements, and acquisition/relocation or retrofitting of flood prone properties or structures. As of 2017 Medford has a Class 6 rating under the CRS program. This rating provides discounts of 20% on flood insurance to properties within the FEMA-identified Special Flood Hazard Area (SFHA), and 10% outside the SFHA.

The *Medford Municipal Code* section entitled “Flood Damage Prevention Regulations and Flood Insurance Maps” states that to accomplish its purposes it includes methods and provisions to:

- (1) *Require development that is vulnerable to floods, including structures and facilities necessary for the general health, safety and welfare of citizens, to be protected against flood damage at the time of initial construction;*
- (2) *Restrict or prohibit uses which are dangerous to health, safety and property due to water or erosion hazards, or which increase flood heights, velocities, or erosion; Control filling, grading, dredging and other development which may increase flood damage or erosion;*
- (3) *Prevent or regulate the construction of flood barriers that will unnaturally divert flood waters or that may increase flood hazards to other lands;*
- (4) *Preserve and restore natural floodplains, stream channels, and natural protective barriers which carry and store floodwaters, and;*
- (5) *Coordinate with and supplement provisions of State of Oregon Specialty Codes enforced by the State of Oregon Building Codes Division.*

While Medford’s infrastructure handled the most recent (1997) flood well, there was damage in some areas along Bear Creek and Larson Creek, emphasizing the continuing need to update and refine the city’s floodplain regulations. Development and redevelopment should be highly scrutinized when located in floodplains. The riparian corridor and wetland building setback requirement will aid in reducing future flood damages to structures and improvements. Existing and proposed requirements for on-site detention of stormwater will aid in regulating storm water

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<sup>41</sup>Ibid.

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flows during peak events.

Some of the recommendations of the Oregon Office of Emergency Management *Interagency Mitigation Team Report* made in response to the 1997 floods in Oregon include the following:

- ◆ Strengthen the public facility planning review process to encourage consideration of stormwater system limitations and coordinate plans with a regional perspective, including upstream and downstream communities. Systems often become inadequate because of growth beyond anticipated levels (i.e., increased amount of impervious surface increases runoff). This growth often occurs without subsequent increases to stormwater capacity or recognition of system limitations.
- ◆ Water storage through various means, such as creation of wetlands, retention areas, detention basins, and dams can assist in flood control. Encourage flood control projects and development of local flood mitigation plans. These plans should incorporate regional concerns and should consider the watershed as a whole. Encourage the establishment of drainage management plans.
- ◆ Where appropriate, allow rivers to reclaim floodplain areas, allowing waterways room to naturally meander and expand. This can be accomplished using conservation easements, land acquisition, riparian trust, and creating wetlands and retention/detention areas, especially in headwater areas.

### **EARTHQUAKES**

While historically, California has been perceived as the most earthquake-prone state in the west, awareness of seismic risk in Oregon has increased significantly since the 1980s, and seismologists and geo-scientists have recognized that the state, as well as the entire Pacific Northwest, may be subject to earthquakes of substantial magnitude. Oregon had not experienced a substantial earthquake for almost a century until 1993, when the state suffered three significant quakes: the first near Salem, in Scotts Mills (magnitude 5.6 on the Richter scale), and two earthquakes later in Klamath Falls (magnitudes 5.9 and 6.0) felt in Medford. Researchers in geo-science have also become more aware of the potential for moderate earthquakes in Oregon, and, during the last decade, have noted the likelihood of an earthquake of great magnitude striking offshore.

Four types of earthquakes affect Medford and the surrounding region: (a) shallow crustal events, (b) deep intra-plate events, (c) the offshore Cascadia Subduction Zone (CSZ) Fault, and (d) earthquakes associated with renewed volcanic activity. Medford's risk from earthquakes is related to its location between two active fault areas as well as its regional importance as a transportation, freight distribution, communications, and service hub. To the east is the fault zone in the Klamath Falls area, and to the west is the CSZ along the coast, which is the chief earthquake hazard for Southwest Oregon. The region is particularly vulnerable due to the large area susceptible to earthquake-induced landslide, liquefaction, and ground shaking.

The 1993 Salem and Klamath Falls earthquakes were crustal earthquakes, which occur along short, shallow faults that are commonly visible at the earth's surface. Historically, these earthquakes have been in the Richter scale 3.0 to 5.0 range, but the historic record is too short to provide a true representation of the probable threats of crustal quakes. Crustal earthquakes are relatively common in the Portland area and the northern Willamette Valley, off the southern coast of Oregon, in northeastern Oregon, and in scattered areas throughout southeastern Oregon. In areas east of the Cascades, the majority of the earthquakes originate in crustal faults.

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Intraplate earthquakes occur within the remains of the ocean floor that have subducted beneath North America. Ground shaking from such earthquakes would be very strong near the epicenter and strong ground shaking would be felt throughout Medford.

Great subduction earthquakes occur worldwide in subduction zones, where continent-sized pieces of the earth's crust are shoved deep into the earth, and are consistently the most powerful type of earthquake recorded, often registering magnitude 8.0 or 9.0. The Cascadia Subduction Zone (CSZ), a 620 mile fault located off the West Coast, from British Columbia to Northern California, has not experienced any large earthquakes during the short 200-year recorded history of earthquakes. According to 2015 data from Oregon Department of Land Conservation and Development (DLCD), there were 18 magnitude 8.8-9.1 megathrust earthquakes in the last 10,000 years that affected the entire subduction zone. The return period for the largest earthquakes is 530 years, and the probability of the next such event occurring in the next 50 years ranges from 7 to 12%. An additional 10 to 20 smaller, magnitude 8.3-8.5 earthquakes affected only the southern half of Oregon and northern California. The average return period for these is about 240 years, and the probability of a small or large subduction earthquake occurring in the next 50 years is 37 to 43%.

Because the Cascadia Subduction Zone could produce a very large earthquake affecting nearly all of western Oregon, land use planning and development must incorporate principles of earthquake preparedness and up-to-date seismic construction standards. A subduction earthquake would significantly damage residences, educational buildings, and government, industrial and commercial buildings in Jackson County. In Medford, the unreinforced masonry buildings in the downtown core and other areas would be especially vulnerable.



## **WILDLAND-URBAN INTERFACE FIRES**

Nationally, more and more homes are being constructed in or adjacent to wildland areas. A desire for a rural or suburban living environment on the fringe of urban areas has increased the risks in what is termed the wildland-urban interface. The interface is the area where residential development comes into contact with areas of natural vegetation that can contribute to rapid fire spread and additional fuel loading. Although Medford has few of these types of areas, the hazard will increase as the City grows farther into the eastern foothills. Some of the fire protection problems that can occur in wildland-urban interface areas include use of combustible exterior construction materials, inadequate access for fire apparatus, lack of fire protection water, lack of residential sprinkler systems, inadequate fuel breaks around structures, driveways that are not clearly addressed, and lack of knowledge by property owners regarding how to act when a fire threatens.

Areas within the Medford UGB that could be susceptible to wildland fires include the far eastern section of the community on the southern and western slopes of Roxy Ann Butte, and generally in the area east of North Phoenix Road wherever steep slopes and thick natural vegetation exist. The City of Medford, Jackson County, and the Oregon Department of Forestry respond in these

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areas according to the location of the fire and mutual aid agreements.

Wildland fires often require special equipment, such as four-wheel drive vehicles, to reach inaccessible areas that are typical of wildland areas. The City has specialized equipment designed specifically for wildland terrain, including four and six-wheel drive vehicles; and employs a combination of standard firefighting equipment with forces of fire fighters on the ground to fight wildland fires effectively. Jackson County has identified areas outside UGBs where the interface exists, prepared a program to inform the public of the special conditions that may threaten public safety and property, and adopted interface fire protection principles into enforceable codes.

### VOLCANIC ERUPTIONS

In Oregon, awareness of the potential for volcanic eruptions greatly increased with the 1980 eruption of Mount St. Helens in Washington State which killed 57 people. The eastern boundary of Jackson County coincides with the crest of the Cascade Mountains, a volcanic range that has a number of still active volcanoes that stretch from Northern California to British Columbia. While questions remain regarding when and to what extent volcanic activity in the Cascades will occur, the *2015 Oregon Natural Hazards Mitigation Plan* states that Jackson County is at some risk from volcano-associated hazards, however remote. According to the Oregon Department of Geology and Mineral Industries, Crater Lake and Mount Shasta are the two biggest volcanic hazards known for Medford, both of which are composite, active volcanoes relatively near the city; however, Mt. McLoughlin, Three Sisters, Newberry Volcano, and Mt. Lassen could also impact Medford if they were to erupt.

While there are several potential hazards associated with volcanic eruptions, the one deemed most likely to affect Medford is that of ashfall. Ashfall occurs when explosive eruptions blast rock fragments into the air. Such blasts may include solid and molten rock fragments called tephra. The largest rock fragments generally fall within two miles of the eruption event, and smaller ash fragments less than 0.1 inches typically rise into the area forming a huge eruption column. In very large eruptions, ashfalls may total many feet in depth near the vent and extend for hundreds or even thousands of miles downwind. Modest production of ashfall would pose chiefly non-life-threatening hazards to nearby communities, including Medford.

Hazards associated with ashfall include:

- Reduced sunlight and visibility;
- Respiratory problems for at-risk populations such as the elderly, young children, and persons with pre-existing respiratory conditions;
- Impacts on public water supplies drawn from surface waters;
- Electric power outages from ash-induced short circuits in distribution lines and substations;
- Disruptions of air traffic;
- Clogging of filters, abrasion and corrosion, and other damages to heating, ventilation, and air-conditioning systems;
- Collapse of roof and structures due to the weight of wet ash;
- Clean-up and ash removal from the transportation network.

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### SEVERE WEATHER

Severe weather is the most frequently occurring natural hazard in Medford. Severe weather includes winter storm events such as heavy rain, wind, snow and ice; other severe weather events are thunderstorms, hail, lightning strikes, tornadoes, and drought/heat waves. In Medford, high winds and periods of extreme cold and heat are common. Less common incidents include snow and ice storms generated in the Siskiyou Mountains which create hazardous driving conditions and may lead to power outages. Typically, storms are short-term in nature, lasting one to two days, and can be managed with local emergency response resources.

Most common from October through April, snowstorms and windstorms can disrupt the region's utilities, telecommunications and roadway systems. Damage from wind storms is typically related to the hazard of falling trees and limbs, and the consequent downing of utility infrastructure and power outages. Fallen limbs and uprooted trees can also block roadways, disrupting the transportation network. Late summer and early fall wind storms, occurring during the dry season, often increase wildfire risks, and heavy rains followed by strong winds often result in the falling of shallow-rooted trees. Jackson County also has extended hot and dry weather conditions during the summer and early fall months, and sequential years of below normal rainfall over winter months can result in severe drought conditions as seen in 1939, 1976-1981, 1987-1994, 2001, and 2013-2015.

It is important to note that severe weather events are often the result of events that affect large geographic areas in Oregon and the Pacific Northwest. As such, it is difficult to make regional severe weather probability assessments. While severe weather events have been more frequent in winter months, climate change is resulting in probabilities becoming a moving target. While history provides insight on past severe weather patterns, in reality, all persons and critical facilities are at risk from severe weather impacts, especially those that result in power outages.

### EMERGING INFECTIOUS DISEASES

Medford is home to the largest, most concentrated population in Region 4 of Oregon's NHMP Natural Hazard Regions. As a regional employment, recreational, residential, retail and health care hub, Medford draws many non-residents on a daily basis into the area, multiplying the opportunities for further disease exposure and transmission among both visitors and residents. Recognizing this expanse of exposure is important; it is possible that a disease related issue could impact a large portion of the region's population.

Disease is a sickness, illness, or loss of health, and terms such as disease outbreaks, epidemics, and pandemics are often used to describe situations where multiple cases of infection are identified and the amount of disease in a community rises above the expected level. The following definitions are from The Centers for Disease Control and Prevention (CDC):

- **Epidemic** refers to an increase, often sudden, in the number of cases of a disease above what is normally expected in that population in that area.
- **Outbreak** carries the same definition of epidemic, but is often used for a more limited geographic area.
- **Cluster** refers to an aggregation of cases grouped in place and time that are suspected to be greater than the number expected, even though the expected number may not be known.
- **Pandemic** refers, to an epidemic that has spread over several countries or continents,

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usually affecting a large number of people.

Diseases are identified, researched, and managed as much as possible by public health agencies. In Medford, the agency that provides surveillance, investigates reportable disease, infections or conditions, and carries out appropriate control measures is Jackson County Public Health. Oregon Health Authority may provide assistance in these investigations.

Emerging infectious diseases have been identified in the top five hazard vulnerabilities within our healthcare systems, and overall it is probable a person will have one or more during their lifetime. The diseases identified in the *2017 Medford Natural Hazards Mitigation Plan* are not the only diseases that exist or could potentially impact Medford, and the vulnerabilities and impacts to people, property, and the environment vary widely. People with access and functional needs (e.g. the elderly, the very young and medically fragile persons) are more susceptible to impacts, as are critical facilities such as hospitals, airports, and fire and police forces. Furthermore, water, air, and land can be contaminated by emerging infectious diseases. When this happens in localized or broad scale situations, many people as well as plants and animals can suffer greatly. While the potential impacts are difficult to quantify in dollar amounts, it is clear that widespread illness, disability, and death impacts the economy.

## OTHER HAZARDS

Although Goal 7 addresses natural disasters and hazards, human caused hazards, such as noise and airport hazards, also have the potential to disrupt the livability of a community, threaten human health and well-being, or harm the environment.

### NOISE

The most common noise sources in Medford are transportation-related and include automobiles, trucks, motorcycles, railroads, and aircraft. Motor vehicle noise is a pressing concern because it often occurs in areas sensitive to noise exposure, such as residential areas, and continues to increase with urban growth and increasing numbers of motor vehicles. Other urban sources of noise include air conditioners, lawn mowers, leaf blowers, radio/stereo/television equipment, sports arenas, schools, and similar entertainment and commercial activities. Construction noise sources, such as diesel engines and air compressors, can generate noise for extended periods with intermittent high noise levels.

Sound is measured in terms of its loudness and pitch. The loudness or magnitude of sound is commonly measured in decibels (dB); the pitch, or frequency is normally expressed in Hertz (Hz) or cycles per second. For human beings, the audible spectrum ranges between 20 and 20,000 Hz, and from zero to 140 dB. An illustration of this scale, along with common noise situations and their impacts is provided in **Figure 14**.

**Figure 14  
Loudness Range of Common Sounds  
Measured at Source or Indicated Distance**

Sound Source	dB	Typical Response
Sonic Boom	140	Painfully Loud
Jet Takeoff (200 feet)	120	Limits of Amplified Speech
Auto Horn (3 feet)	110	Maximum Vocal Effort
Shout (0.5 feet)	100	Very Annoying
Heavy Truck (50 feet)	90	Annoying
Pneumatic Drill (50 feet)	80	Telephone Use Difficult
Freeway Traffic (50 feet)	70	
Air-conditioning Unit (20 feet)	60	
Living Room	50	Quiet
Library	40	
Soft Whisper	30	Very Quiet
Leaves Rustling	10	Just Audible
	5	Threshold of Hearing

SOURCE: Environmental Quality, the First Annual Report (Washington, D.C.: CEQ, August 1970)  
 NOTES: dB=decibel

**FEDERAL AND STATE NOISE REGULATIONS**

The *Federal Noise Control Act of 1972* placed a number of noise-related programs under the authority of the Environmental Protection Agency (EPA). The EPA’s major roles consist of regulating aircraft noise (with the Federal Aviation Administration), product noise, and interstate railroads and motor carrier noise.

Oregon’s *Noise Control Act of 1971* gave the Oregon Department of Environmental Quality (DEQ) authority to adopt standards for motor vehicles, industry, motor raceways, airports, and commerce. The standards establish motor vehicle noise emission limits and set ambient noise limits for commercial and industrial operations. The standards vary according to time of day and proximity to *noise sensitive properties*. DEQ becomes involved in noise problems when it receives a citizen complaint about a noise source under DEQ authority.

**NOISE REDUCTION STRATEGIES**

**Vehicle-Related Noise Reduction Techniques**

In Medford, high vehicle-related noise is associated with Interstate 5 and Highway 62, as well as high-volume arterial streets. There are a variety of means a city can undertake to reduce motor vehicle-related noise impacts. These may include:

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- Enforcement of vehicle noise emission standards
- Proper location of truck routes
- Limitation of traffic volume on certain street types
- Requirements for fencing, walls, berms, landscaping, etc., along certain street types

### **Airport-Related Noise Compatibility**

Airport-related noise compatibility is discussed below under “Airport Hazards.”

### **Building and Site Design**

Noise can be attenuated through proper building design. For example, windows, vents, and other openings can be positioned away from a noise source such as a freeway. Buildings located close to noise-producing uses can be built with thicker walls or insulation, and proper windows. Similarly, sources of noise within a development, such as air conditioners, can be designed and located to direct noise away from noise sensitive areas. Site design is one of the most effective means of protecting dwelling units in a noisy environment. As an illustration, if a project is proposed adjacent to a freeway, the building layout can effectively attenuate noise by placing the dwelling units as far away from the noise source as possible, with the non-dwelling buildings, parking, and driveways located between the dwellings and the noise source.

### **Noise Ordinance**

Medford’s Noise Ordinance, located in the *Land Development Code*, regulates the level of commercial and industrial noise, based on the proximity to noise sensitive properties. The ordinance was prepared in the 1980s to comply with DEQ standards and procedures. Some noise sources are exempt from the ordinance, such as construction and landscape maintenance, but are subject to other sections of the *Medford Municipal Code*. Review of the Noise Ordinance is necessary to determine if revisions are needed.

### **Bufferyards**

Medford’s *Land Development Code* requires bufferyards which use setbacks, fencing/walls/berms, and vegetation to mitigate potential adverse impacts between adjacent land use types. Bufferyard standards are intended to minimize potential conflicts caused by nuisances, such as glare and noise. The width of the bufferyard, as well as the types and numbers of trees and shrubs contained in the bufferyard, and the type and height of fencing are dependent upon the zoning of the abutting properties.

### **Agricultural Buffering**

Medford and Jackson County jointly implement policies and regulations to minimize the potential adverse impacts of urban development on abutting agricultural uses. An integral part is the mitigation of noise generated by agricultural machinery such as tractors, sprayers, and crop-dusters. The required buffer is intended to reduce noise complaints from residents of new abutting development. Deed declarations are required for those properties abutting agricultural uses, to recognize the right to use accepted farming practices. The agricultural buffering ordinance is in the Medford *Land Development Code*.

## **AIRPORT HAZARDS**

The Rogue Valley International Medford Airport encompasses 885 acres in the northern portion of the City. It is the major airport serving southwestern Oregon and the far northern part of California. Use of the facilities continues to increase steadily, although in 1998, the airport was

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operating at about 50% of capacity. The 1986 *Airport Master Plan and Noise Compatibility Study for the Medford-Jackson County Airport*, Coffman Associates, studied land uses surrounding the airport as related to hazards and noise. Most of the actions recommended by the study to address incompatible land uses have been completed by the airport, which is managed by Jackson County.

Most of the safety hazards associated with airports are related to takeoffs and landings. In 1985, the Airport constructed an aircraft rescue and firefighting facility (ARFF) that is staffed with contract ARFF-certified airport staff. It is located south of the passenger terminal building that was opened in 2009. Future consideration for relocating the ARFF in order to meet Federal Aviation Regulations (FAR) and International Civil Aviation Organization (ICAO) standards is explained in the *Rogue Valley International-Medford Airport Master Plan Update, Final Report, February 2013*, prepared by Barnard Dunkelberg Company. The consideration to relocate the ARFF in the future closer to the mid-point of the runway will assist in meeting federal and international standards for responding to an emergency situation at the airport.

Airport approach and departure paths are critical areas in terms of land use compatibility. The Federal Aviation Administration (FAA) has adopted Federal Aviation Regulations (FAR) Part 77 regarding “*objects affecting navigable airspace.*” FAR Part 77 provides guidance to control the height of objects in the area surrounding the airport and to protect the airport’s airspace and approaches from hazards. Safety zones consist of Runway Protection Zones (formerly Clear Zones), Runway Safety Areas, and Runway Object-Free Areas. The Runway Safety Areas and Object-Free Areas are located within the airport proper, but Protection Areas often extend beyond the boundaries of an airport. The FAA recommends that airports own as much of the Protection Areas as possible. For most of the Protection Areas identified in the 1986 Airport Master Plan, the airport undertook a noise compatibility program that prioritized the areas for purchase, and then acquired them. The *Medford-Jackson County Airport Master Plan Update, 1993*, prepared by Airport Technology and Planning Group, Inc. identified the “Imaginary Surfaces” used to determine potential obstructions to air navigation. The plan identified the existing obstructions within these areas, such as trees, buildings, antennas, navigation aids, etc. The Airport Master Plan 2013 Update includes a set of maps that depict these imaginary approach surfaces including the Runway Protection Zones (RPZ) that extend off the ends of the runways. The plan identifies recommended land acquisition areas that encompass the existing and future RPZs.

Within the City of Medford, the airport and its environs are generally designated and zoned for industrial uses. The City adopted an Airport Approach (A-A) Overlay Zone in 1991. The area encompassed by the A-A Overlay Zone, the “Approach Surface,” is one of the FAA “Imaginary Surfaces” noted above. The A-A Overlay Zone prohibits places of assembly, and restricts light, glare, and other causes of impaired visibility. According to the Airport Master Plan 2013 Update, the FAA approved the closure of Runway 9/27 (running east/west) and converting the pavement to a taxiway. This modification will result in a change to the A-A overlay zone. An Airport Radar (A-R) Overlay Zone was adopted in 1992. It prohibits objects in excess of 40 feet in height, and requires all construction to be reviewed by the Oregon Department of Aviation (ODA) and the Federal Aviation Administration (FAA). The airport installed a \$23 million radar system in 1995 located near Crater Lake Highway. The A-R Overlay Zone generally encompasses an area extending east of the airport to Crater Lake Highway, and south of Vilas Road to the westerly extension of Coker Butte Road.

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While local governments must strive to assure land use compatibility with airport operations, airports usually take on the responsibility of minimizing their noise impacts. Airports can often affect noise impacts through a variety of means, including proper airport design, runway use, curfews, takeoff, climbing, and landing procedures, noise monitoring, etc. The FAA has guidelines for land use compatibility related to airport-generated noise. Most land uses are considered incompatible with noise levels exceeding 75DNL<sup>42</sup>, and residential development is considered incompatible with noise levels exceeding 65DNL.

The 1986 noise compatibility study established the runway noise contour lines for the Medford Airport. These were updated in 1999 as part of an environmental assessment by David Evans and Associates for a runway expansion project. (See **Figure 15** for the year 2000 noise contours.) In Medford, the airport has few residentially designated areas nearby, although the Central Point Urban Growth Boundary (UGB) is in close proximity to the northwest. The residential areas most impacted by airport noise (within the 65DNL contour) are located between Corona Avenue and Crater Lake Avenue, north of Johnson Street in Medford, and the area west and north of the intersection of Table Rock Road and Vilas/Hamrick Road in the Central Point UGB.

The *Airport Master Plan 2013 Update* used the FAA's Integrated Noise Model (INM) Version 7.0b to model the noise environment at the airport for 2010, 2020, and 2030. The results are depicted graphically in the master plan update and explain the following: In 2010, the 65 DNL (day-night sound level) noise contour encompasses roughly 270 acres with the 65 DNL noise contour remaining primarily on airport property.

The 2020 model was developed to show the anticipated effects of the proposed parallel runway project identified in the Conceptual Development Plan Phase 1. The 65 DNL contour is wider with the proposed parallel runway. The 65 DNL noise contour encompasses roughly 336 acres. The overall cumulative effect of the parallel runway is a positive change in noise exposure in that the more populated residential areas to the south of the Airport would be exposed to less aircraft noise.

The 2030 model was developed to show the anticipated effects of the proposed upgrade to the ARC C-II of the parallel runway included in the Conceptual Development Plan Phase II. The area of 65 DNL is again enlarged and encompasses roughly 364 acres. The information indicates the overall cumulative effect of the upgraded parallel runway is a positive change in noise exposure to the south compared to the existing contour, but an increase in noise exposure to the south compared to the 2020 contours.

The 2013 Update identifies the requirements for deed declarations and noise abatement strategies for private properties where the noise level may be at or above 55 DNL. The City may impose such requirements after notification of the project is sent to the Airport and the Airport provides written justification for the specific requirements.

The updated airport master plan also refers to requirements for aviation easements from private property owners. The City does not concur with the blanket requirement of these easements and chooses not to apply the requirement on lands within the Airport Approach or the Airport Area

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<sup>42</sup>DNL - Yearly day-night average sound level noise contour - a method for measuring noise generated by an airport.

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of Concern overlays. Instead, as part of the land use application process, the City will include the airport as a referral agency, giving the airport the opportunity to review development proposals within these areas on a case-by-case basis and then require an aviation easement if it is warranted. This decision is based upon LUBA Case No. 2010-11 (*Barnes v. City of Hillsboro*).

The Oregon Department of Aviation (ODA) and the Federal Aviation Administration (FAA) review hazards to air navigation as required by Oregon Administration Rule (OAR) 738-070. Both agencies have guidelines for land use compatibilities that include both noise levels as well as land uses on real properties. Each agency will issue a determination of “hazard” or “no hazard” related to development proposed in the overlays.

The Rogue Valley International Medford Airport Master Plan Update, Final Report, February 2013, is adopted by reference.

**DISASTERS AND HAZARDS CONCLUSIONS**

1. The Medford Urban Growth Boundary contains streams and waterways that have a history of flooding occasionally.
2. The *National Flood Insurance Program* is available in communities that implement comprehensive floodplain regulations to reduce flood damage. As a participant in this program, Medford adopted regulatory provisions to minimize flood losses through development controls such as building codes and development regulations that place restrictions on new construction or improvements to flood-prone structures.
3. According to seismologists, the likelihood of an earthquake of serious magnitude in the Northwest is high. Medford is at risk for potential earthquake damage because many older buildings have not been built or upgraded to current earthquake standards. Medford's emergency management planning recognizes this possibility.
4. The threat of wildland-urban interface fires within the Medford Urban Growth Boundary will increase as development abuts or increases in areas prone to wildland fire dangers, such as steep slopes, dense natural vegetation, etc.
5. The threat of loss of life and/or property damage in areas that may be impacted by wildland-urban interface fires can be reduced through the use of ignition-resistant construction methods/materials, adequate fire response apparatus, availability of fire protection water, adequate fuel breaks surrounding structures, appropriate road widths to accommodate fire fighting vehicles, and response and evacuation plans that are understood by the residents of these areas.
6. The eastern boundary of Jackson County coincides with the crest of the Cascade Mountains, a volcanic range that has a number of still active volcanoes. According to the Oregon Department of Geology and Mineral Industries, Crater Lake and Mount Shasta are the two biggest volcanic hazards known for Medford, both of which are composite, active volcanoes relatively near the city.
7. While there are several potential hazards associated with volcanic eruptions, the one deemed most likely to affect Medford is that of ashfall. Likely hazards associated with ashfall include respiratory problems, impacts on transportation networks, power outages, and damage to building air filtration systems.
8. Severe weather is the most frequently occurring natural hazard in Medford. Typically, storms are short-term in nature, lasting one to two days, and can be managed with local emergency response resources.
9. Snowstorms and windstorms can disrupt the region's utilities, telecommunications and roadway systems. Damage from wind storms is typically related to the hazard of falling trees and limbs, and the consequent downing of utility infrastructure and power outages. Late summer and early fall wind storms, occurring during the dry season, often increase wildfire risks.
10. Severe weather events, including those exacerbated by climate change, are becoming more

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common. All persons and critical facilities are at risk from severe weather impacts, especially those that result in power outages.

11. Emerging infectious diseases have been identified in the top five hazard vulnerabilities within our healthcare systems, and overall it is probable a person will have one or more during their lifetime. People with access and functional needs (e.g. the elderly, the very young and medically fragile persons) are more susceptible to impacts, as are critical facilities such as hospitals, airports, and fire and police forces. Furthermore, water, air, and land can be contaminated by emerging infectious diseases.
12. As a regional employment, recreational, residential, retail and health care hub, Medford draws many non-residents on a daily basis into the area, multiplying the opportunities for further disease exposure and transmission among both visitors and residents.
13. The most common noise sources in Medford are transportation-related, and include automobiles, trucks, motorcycles, railroads, and aircraft. Motor vehicle noise is a pressing concern, because it often occurs in areas sensitive to noise exposure, such as residential areas, and continues to increase with urban growth and increasing numbers of motor vehicles.
14. The City of Medford has adopted noise reduction strategies in the *Land Development Code* to mitigate the harmful effects of noise, including a noise ordinance, which regulates the level of commercial and industrial noise based on the proximity to noise-sensitive properties; bufferyards, which use setbacks, fencing/walls/berms, and vegetation to mitigate adverse impacts between adjacent land use types, and agricultural buffering, in which Medford and Jackson County jointly implement policies to minimize the impacts of urban development on abutting agricultural uses.
15. Airports can adversely impact residential and other sensitive development through noise and accident hazards. Future airport expansion plans could create land use conflicts as flights increase.

**DISASTERS AND HAZARDS**  
**GOALS, POLICIES, AND IMPLEMENTATION MEASURES**

**Goal 12:** *To protect the citizens of Medford from the potential damage caused by hazards such as flooding, earthquakes, wildland-urban interface fires, volcanic eruptions, severe weather, emerging infectious diseases, noise, and airport hazards.*

**Policy 12-A:** The City of Medford shall assure that hazard mitigation standards are formally adopted as public policy through comprehensive planning, land development ordinances, permit review, and fire/building safety codes.

**Implementation 12-A (1):** Continue to conduct hazard risk analysis, including identifying the types, magnitude, and probability of hazards which the Medford Urban Growth Boundary is susceptible to over the long term, including assessing the degree of risk that the citizens find acceptable.

**Policy 12-B:** The City of Medford shall ensure that the potential impacts of flooding are adequately analyzed when considering development projects.

**Implementation 12-B (1):** Maintain and, when necessary, update the city's requirements for development in floodplains, consistent with federal and state regulations, and the *Uniform Building Code* (UBC).

**Implementation 12-B (2):** Adhere to the policies outlined in the *Medford Comprehensive Drainage Master Plan* to minimize flood losses through development controls.

**Implementation 12-B (3):** Encourage the re-mapping of flood-prone areas in Medford using data from the most recent flood(s) of record.

**Implementation 12-B (4):** Consider flood hazards when installing public improvements such as parks and paths in flood-prone areas. Design these amenities to withstand a certain flood level.

See also the Policies of the *Storm Water Drainage* section of the "Public Facilities Element."

**Policy 12-C:** The City of Medford shall continue to utilize building and development standards to mitigate the potentially damaging effects of earthquakes. New construction is required to meet the standards of seismic zone 3 of the *Uniform Building Code* (UBC).

**Policy 12-D:** The City of Medford shall strive to upgrade all city-owned buildings and facilities to meet earthquake standards.

**Policy 12-E:** The City of Medford shall continue to update and enforce noise attenuation strategies.

## ENVIRONMENTAL ELEMENT

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**Implementation 12-E (1):** Periodically review the city's noise ordinances for adequacy.

**Policy 12-F:** The City of Medford shall strive to minimize the loss of life and property resulting from wildland-urban interface fires within the Urban Growth Boundary.

**Implementation 12-F (1):** Undertake efforts to educate the public in wildland-urban interface fire safety.

**Implementation 12-F (2):** Develop and adopt fire safety performance standards for development in those areas identified as being at risk of wildland-urban interface fires.

**Policy 12-G:** The City of Medford shall designate future residential areas in coordination with the *Rogue Valley International-Medford Airport Master Plan* to minimize conflicts with flight patterns, hazard areas, and airport expansion areas.

## APPENDIX A WILDLIFE HABITAT MEDFORD URBAN GROWTH BOUNDARY

### HABITAT TYPES

- Commercial (C):** Areas with business buildings and associated surfaced and fenced land, usually classified as commercial on city and county zoning maps.
- Residential (Rs):** Areas generally with more than one dwelling per two hectares (five acres), using 20-hectare (50-acre) plots for averaging.
- Agricultural (A):** Areas generally of parcels more than two hectares (five acres) in size managed for commercial agriculture within the prior six years, excluding timber production and open range grazing. Usually in river valleys.
- Grassland (G):** Open grassland with no trees (not agricultural).
- Savanna (S):** Grassland or rocky shrub land with scattered trees.
- Woodland (W):** Conifer, deciduous, or mixed forest.
- Riparian (Rp):** Terrestrial habitat within 20 meters (66 feet) of permanent streams, lakes, or intermittent water courses or basins that contain water at least six months of the year.

**Riparian** habitat also contains the following **aquatic** habitats:

**Intermittent (I):** Water courses and basins that contain water six to eleven months of the year, including grasslands or agricultural fields that are flooded six to eleven months per year.

## **ENVIRONMENTAL ELEMENT**

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**Streams (St):** Water channels less than ten meters (33 feet) wide.

**Rivers (Rv):** Water channels more than ten meters (33 feet) wide.

**Lakes (L):** Water basins or reservoirs more than two hectares (five acres) in size.

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**ENVIRONMENTAL ELEMENT**

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**WILDLIFE INVENTORY**

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**Terrestrial Species**

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**Birds**

<i>Common Name</i>	<i>Habitat</i>	<i>Common Name</i>	<i>Habitat</i>
Turkey vulture	A, G, S, Rp, W	Northern mockingbird	Rs, A, G, S, W
Cooper's hawk	Rs, S, G, S, Rp, W	Townsend's solitaire	G, S, A, W
Northern goshawk	Rp, W	Western bluebird	G, S, W
Sharp-shinned hawk	A, G, S, Rp, W, Rs	Mountain bluebird	G, S, W
Northern Harrier	A, G, S, Rp	Blue-gray gnatcatcher	S, Rp, W
Rough-legged hawk	A, G, S, Rp, W	Golden-crowned kinglet	S, Rp, W, Rs
Red-tailed hawk	A, G, S, Rp, W	Ruby-crowned kinglet	S, Rp, W, Rs
Swainson's hawk	S, Rp, W	Bohemian waxwing	Rp, Rs, S
Common nighthawk	C, Rs, A, G, S, Rp, W	Cedar waxwing	Rs, A, S, Rp, W
Golden eagle	G, S, Rp, W	Northern shrike	G, S, Rp
Bald eagle	S, Rp, W	Loggerhead shrike	G, S, Rp
Prairie falcon	G, S, Rp	European starling	C, Rs, A, G, S, Rp, W
Black-shouldered kite	G, S, Rp, A	Solitary vireo	Rp, W, Rs
American kestrel	Rs, A, G, S, Sp	Warbling vireo	Rp, W, Rs
Blue grouse	Rs, A, G, S Rp, W	Hutton's vireo	W, Rs, Rp
Ruffed grouse	S, Rp, W	Nashville warbler	Rp, W, S
California quail	Rs, A, G, Rp	Yellow warbler	Rs, Rp
Mountain quail	S, Rp, W	Yellow-rumped warbler	Rs, Rp, W, S
Ring-necked pheasant	Rs, A, G, Rp	Townsend's warbler	Rp, W, S
Band-tailed pigeon	S, Rp, W	Black-throated gray warbler	Rp, W, Rs
Rock dove	C, Rs, A, G, S, Rp, W	MacGillivray's warbler	Rp, W, Rs
Mourning dove	Rs, A, G, S	Orange-crowned warbler	Rp, W, Rs
Western screech owl	Rs, A, G, S, Rp, W	Wilson's warbler	Rs, Rp, W
Great horned owl	Rs, A, G, S, Rp, W	Western meadowlark	Rs, A, G, S, Rp
Short-eared owl	A, G	Red-winged blackbird	C, Rs, A, S, Rp, W
Barn owl	A, G, S, Rp, W	Say's phoebe	G, S, Rp, W
Northern spotted owl	Rp, W	Western wood-peewee	Rp, W
Northern saw-whet owl	S, Rp, W	Common poorwill	G, S

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## ENVIRONMENTAL ELEMENT

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<i>Common Name</i>	<i>Habitat</i>	<i>Common Name</i>	<i>Habitat</i>
Northern pygmy owl	G, Rp, W, R	Horned lark	R, S
Burrowing owl	A, G, S	Barn swallow	Rs, A, Rp
Long-eared owl	S, Rp, W	House sparrow	C, Rs, A, G, S, Rp, W
Peregrine falcon	A, G, S, Rp	Tri-colored blackbird	Rs, A, G, S, Rp
Vaux's swift	G, S, Rp, W, C, Rs	Brewer's blackbird	C, Rs, A, S, Rp, W
Anna's hummingbird	Rs, S, Rp	Yellow-headed blackbird	A, G, Rp
Rufous hummingbird	Rs, A, G, S, Rp	Northern oriole	Rs, Rp, W
Allen's hummingbird	G, S, Rp, W	Western tanager	Rs, A, Rp, W
Black-chinned hummingbird	Rs, S, Rp	Savannah sparrow	S, Rp, A, G
Calliope hummingbird	W	Lark sparrow	G, S, Rp, A
Merlin	G, S, Rp, W, Rs	Chipping sparrow	Rs, A, G, S, Rp, W
Northern flicker	Rs, A, S, Rp, W	Harris's sparrow	G, s, Rp, Rs
Acorn woodpecker	Rs, A, S, Rp, W	White-crowned sparrow	Rs, A, G, S, Rp
Lewis' woodpecker	Rs, A, S, Rp, W	Golden-crowned sparrow	G, S, Rp, Rs, A
Hairy woodpecker	Rs, A, S, Rp, W	Black-throated sparrow	S
Downy woodpecker	Rs, A, S, Rp, W	Black-chinned sparrow	S
Pileated woodpecker	Rp, W	White-throated sparrow	Rs, A, G, S, Rp
Red-breasted sapsucker	Rs, A, S, Rp, W	Fox sparrow	A, Rp, W, Rs
Hammond's flycatcher	Rp, W	Song sparrow	A, S, Rp, W
Ash-throated flycatcher	G, S, Rp, W	Lincoln's sparrow	Rs, A, S, Rp
Willow flycatcher	Rp, W	Brown-headed grosbeak	Rs, A, Rp, W
Western flycatcher	Rp, W	Evening grosbeak	Rp, W, Rs
Dusky flycatcher	Rp, W	Purple finch	Rs, A, S, Rp, W
Olive-sided flycatcher	Rp, W	Cassin's finch	S, Rp, W, Rs
Cordilleran (western) kingbird	Rs, A, G, S, Rp	House finch	Rs, A, S, Rp, W
Eastern king bird	Rs, A, S, Rp	American goldfinch	Rs, A, G, S, Rp
Black phoebe	Rp, W	Lesser goldfinch	Rs, A, G, S, Rp
Cliff swallow	Rs, A, Rp	Pine siskin	S, Rp, W, Rs
Violet-green swallow	Rs, A, Rp	Lazuli bunting	S, Rp, W
Tree swallow	Rs, A, Rp, W	Rufous-sided towhee	Rs, A, Rp, W, S
Mountain chickadee	S, Rp, W, Rs	California (brown) towhee	Rs, A, Rp, W, S
Chestnut-backed chickadee	S, Rp, W, Rs	Dark eyed junco	Rs, A, G, S, Rp, W
Northern rough-winged swallow	Rp, W	Plain titmouse	S, Rp, W, Rs
Purple martin	Rs, A, Rp	Bushtit	S, Rp, W, Rs

## ENVIRONMENTAL ELEMENT

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<i>Common Name</i>	<i>Habitat</i>	<i>Common Name</i>	<i>Habitat</i>
Steller's jay	Rs, A, S, Rp, W	White-breasted nuthatch	S, Rp, W, Rs
Scrub jay	Rs, A, S, Rp, W	American crow	C, Rs, A, G, S, Rp, W
Black-billed magpie	A, S, Rp	Black-capped chickadee	S, Rp, W, Rs
Vesper sparrow	G, S	Common raven	A, S, W

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## Mammals

<i>Common Name</i>	<i>Habitat</i>	<i>Common Name</i>	<i>Habitat</i>
Virginia opossum	Rp, W, S, G, Rs	Deer mouse	Rs, A, S, Rp, W
Trowbridge's shrew	W	Pinon mouse	S
Pacific shrew	Rp, W	House mouse	C, Rs
Vagrant shrew	Rp	Western jumping mouse	G, Rp
Shrew mole	Rp, W	Pacific jumping mouse	G, Rp
Broad-footed mole	A, G, S, W	California red-backed vole	W
Townsend's mole	A, G, S, W	California meadow vole	A, G, Rp
Pallid bat	Rs, A, S, Rp, W	Townsend's vole	A, G, Rp
Townsend's big-eared bat	Rs, A, S, Rp, W	Oregon vole	S, Rp, W
Silver-haired bat	Rs, A, W	Porcupine	S, W
Hoary bat	W	Red fox	A, G, S
Big brown bat	Rs, A, S, Rp, W	Gray fox	S, W
Brazilian free-tailed bat	Rs, A, S, Rp, W	Coyote	A, G, S, Rp, W
Fringed myotis	Rs, A, S, Rp, W	Black Bear	S, Rp, W
Long-eared myotis	Rs, A, S, Rp, W	Raccoon	Rs, A, S, Rp, W
Long-legged myotis	Rs, A, S, Rp, W	Ringtail	S, Rp, W
California myotis	Rs, A, S, Rp, W	Long-tailed weasel	A, S, Rp, W
Small-footed myotis	Rs, A, S, Rp, W	Ermine	A, S, Rp, W
Yuma myotis	Rs, A, S	Badger	A, G, S
Little brown myotis	Rs, A, S, Rp, W	Striped skunk	Rs, A, G, S, Rp, W
Brush rabbit	Rs, A, Rp, W	Spotted skunk	S, Rp, W
Black-tailed jackrabbit	A, G, S	Mountain lion	S, W
Mountain beaver	Rp, W	Bobcat	S, Rp, W
Yellow-pine chipmunk	S, Rp, W	Black-tailed deer	S, Rp, W

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## ENVIRONMENTAL ELEMENT

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### Reptiles

<i>Common Name</i>	<i>Habitat</i>	<i>Common Name</i>	<i>Habitat</i>
Western fence lizard	Rs, A, S, W	Rubber boa	S, Rp, W
Sagebrush lizard		Common garter snake	Rs, A, S, Rp, W
Southern alligator lizard	Rs, A, S, Rp, W	Western terrestrial garter snake	Rp
Northern alligator lizard	Rs, A, S, Rp, W	Northwestern garter snake	Rp
Western skink	Rs, A, S, Rp, W	Ring-necked snake	Rp, W
Harvest mouse	A, G	Sharp-tailed snake	Rp
Common king snake	G, S, Rp	Striped whip snake	G, S
Mountain king snake	G, S, Rp	Racer	Rs, A, S, Rp, W
Western rattlesnake	Rp	Gopher snake	Rs, A, G, S, Rp, W

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### Amphibians

<i>Common Name</i>	<i>Habitat</i>	<i>Common Name</i>	<i>Habitat</i>
Western toad	Rs, A, S, Rp, W	Spotted frog (threatened)	Rp
Pacific tree frog	Rs, A, Rp, W	Long-toed salamander	Rs, A, G, S, Rp, W
Foothill yellow-legged frog	Rp	Pacific giant salamander	Rp, W
Red-legged frog	Rp	Del Norte salamander	Rp, W
Bull frog	Rp	Black salamander	Rs, A, G, S, Rp, W
Tailed frog	Rp	Clouded salamander	Rp, W
Cascades frog	Rp	Rough-skinned newt	Rs, A, Rp, W
Ensatina	Rp		

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### Aquatic Species

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#### Birds

<i>Common Name</i>	<i>Habitat</i>	<i>Common Name</i>	<i>Habitat</i>
Western grebe	Rv, P, L	Least sandpiper	Rp, I, Rv, P, L
Horned grebe	Rv, P, L	Western sandpiper	Rp, Rv, P, L
Pied-billed grebe	Rv, L	Greater yellowlegs	Rp, I, P, L
Eared grebe	Rv, P, L	Long-billed dowitcher	Rp, I, P
Tundra swan	Rp, Rv, L	Dunlin	Rp, I, P, L

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## ENVIRONMENTAL ELEMENT

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<i>Common Name</i>	<i>Habitat</i>	<i>Common Name</i>	<i>Habitat</i>
Canada Goose	Rp, Rv, L	Sanderling	Rp, I, P
White-fronted goose	Rp, I, Rv, P, L	Wilson's phalarope	Rp, I, St, Rv, P, L
Northern pintail	Rp, I, St, P, Rv, L	Red-necked phalarope	Rp, I, St, Rv, P, L
American widgeon	Rp, I, St, Rv, P, L	Common snipe	Rp, I, Rv, P, L
Northern shoveler	Rp, I, St, Rv, P, L	California gull	Rp, I, Rv, P, L
Blue-winged teal	Rp, I, St, Rv, P, L	Ring-billed gull	Rp, I, Rv, P, L
Cinnamon teal	Rp, I, St, Rv, P, L	Bonaparte's gull	Rv, L
Green-winged teal	Rp, I, St, Rv, P, L	Forester's tern	Rv, P, L
Wood duck	Rp, I, St, Rv, P, L	Caspian tern	L
Canvasback	Rv, L	Black tern	L
Ring-necked duck	Rv, P, L	Belted kingfisher	Rp, Rv, L, P
Lesser scaup	Rv, L	American dipper	Rp, St, Rv
Common goldeneye	Rp, St, Rv, P, L	Marsh wren	Rp
Barrow's goldeneye	Rv, L	American pipit	Rp, St, L
Bufflehead	St, Rv, P, L	American bittern	Rp, Rv, L
Ruddy duck	St, Rv, P, L	Redhead	Rv, P, L
Common merganser	Rv, P, L	Osprey	Rp, Rv, L
Hooded merganser	St, Rv, P, L	Great egret	Rp, P, L
Double-crested cormorant	Rv, L	Great blue heron	Rp, Rv, P, L
Mallard	Rp, I, St, Rv, P, L	Green-backed heron	Rp, Rv, P, L
Gadwall	Rp, I, St, Rv, P, L	Black-crowned Night-Heron	Rp, P, L
Virginia rail	Rp, P	Black-bellied plover	L
Sora	Rp, P, L	Spotted sandpiper	Rp, I, Rv, P, L
American Coot	Rp, I, St, Rv, P, L	Pectoral sandpiper	Rp, I, P, L
Semi-palmated plover	Rp, I, P	Baird's sandpiper	L

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## Mammals

<i>Common Name</i>	<i>Habitat</i>	<i>Common Name</i>	<i>Habitat</i>
Water shrew	Rp	Muskrat	Rp, St, Rv, P, L
Marsh shrew	Rp	Mink	Rp, St, Rv, P, L
Beaver	Rp, St, Rv, P, L	River otter	Rp, St, Rv, P, L

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## ENVIRONMENTAL ELEMENT

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### Reptiles

<i>Common Name</i>	<i>Habitat</i>	<i>Common Name</i>	<i>Habitat</i>
Western pond turtle (threatened)	Rp, St, Rv, P, L	Western aquatic garter snake	Rp, I, St, P

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### Amphibians (Also See Terrestrial Species)

<i>Common Name</i>	<i>Habitat</i>	<i>Common Name</i>	<i>Habitat</i>
Long-toed salamander	St, P, L	Pacific tree frog	Rp, I, St, P
Pacific giant salamander	Rp, St, Rv, L	Foothill yellow-legged frog	Rp, St
Del Norte salamander	Rp	Red-legged frog	Rp, St
Black salamander	Rp	Bullfrog	Rp, St, Rv, P, L
Clouded salamander	Rp, St	Tailed frog	Rp, St, Rv
Dunn's salamander	Rp, I	Cascades frog	Rp, I, St, P, L
Rough-skinned newt	Rp, I, P, L	Spotted frog	Rp, St, Rv, P, L
Western toad	Rp, P, L	Rough-skinned newt	Rp, I, St, Rv, P, L

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10/89, Dr. Stephen Cross, (Mammals, Reptiles, Amphibians); Otis D. Swisher (Birds), Department of Biology, SOU, Ashland

**APPENDIX B  
HISTORIC RESOURCES INVENTORY  
MEDFORD URBAN GROWTH BOUNDARY**

**1A LIST  
SIGNIFICANT HISTORIC RESOURCES  
CITY OF MEDFORD**

*See the Historic Resources Inventory Data Base List  
Copies Available in the Medford Planning Department*

**1A LIST**  
**SIGNIFICANT HISTORIC RESOURCES (PARTIAL)**  
**CITY OF MEDFORD**

Not updated with the Medford Downtown Historic District unless previously listed on the National Register. See the Historic Resources Data Base List for the full 1A list.

<b>HISTORIC NAME</b>	<b>ZONE</b>	<b>ADDRESS</b>
A.J. Fredenburg House	C-SP/H	243 South Holly Street
Acme Hardware Building	C-C/CB	1 West 6th Street
Adkins-Childers Building	C-C/CB	226 East Main Street
Alfred Evan Reames House	C-S/P	816 West 10th Street
Barnum (Grand) Hotel	C-C/CB/H	216 North Front Street
Bates Candy Warehouse	C-G/CB	160 North Fir Street
Bates Barber Shop	C-C/CB	126 West Main Street
Beck Apartments	C-C/CB	24 South Grape Street
BPOE (Elks) Lodge	C-C/CB/H	202 North Central Avenue
C. Fridiger Building	C-C/CB	111 North Central Avenue
<del>Cargill Court Apartments</del> <i>delisted</i>		<del>331 West 6th Street</del>
C.A. Winetrout Building (Crater Lake Motors)	C-C/CB	29 West Main Street
C.E. "Pops" Gates House	SFR-6	1307 Queen Anne Avenue
Central Fire Hall/City Hall	C-C/CB	110 East Sixth Street
Charles Sweeney House	C-S/P	2336 Table Rock Road
Childers Building-Dreamland Ballroom	C-C/CB	417 East Main Street
Clara Barkdull Building	C-C/CB	117 North Central Avenue
Clemons-Brandon House	C-C/CB	211 North Ivy Street
Cooley Building - Craterian Theater	C-C/CB	23 South Central Avenue
Corning Court Ensemble	C-S/P	5, 6, 11, 15, & 16 Corning Court
Crater Lake Garage	C-C/CB	123 South Front Street
Daniel L. McNary	C-C/CB	243 North Ivy Street
Davis Building	C-C/CB	30 North Central Avenue
Davis Cornwall Building-North	C-C/CB	127 South Bartlett Street
De Voes Confectionary	C-C/CB	2 North Oakdale Avenue

## ENVIRONMENTAL ELEMENT

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<b>HISTORIC NAME</b>	<b>ZONE</b>	<b>ADDRESS</b>
Derrick's Cafeteria	C-C/CB/BC	17 South Riverside Avenue
Dillon Hill House		1307 Kings Highway
Dr. E.B. Pickel Rental House	C-C/H	815 West Main Street
Dr. John F. Reddy House	SFR-4	122 Oregon Terrace
Edgar Hafer House	C-C/CB/H	426 West 6th Street
Evelyn Apartments	C-C/CB	107 North Ivy Street
Fehl Building	C-C/CB	332 West 6th Street
First National Bank Building	C-C/CB	120 East Main Street
Florence Graves House	C-C/CB	220 North Oakdale Avenue
Fluhrer Bakery Building	C-C/CB/H	29 North Holly Street
Fluhrer Pastry Plant	C-G/CB	125 West 4th Street
Frank Clark-Jackson House	SFR-4/H	1917 East Main Street
Garnett-Cory (Liberty) Building	C-C/CB/H	201 West Main Street
Getchell Building	C-C/CB	115 West Main Street
Halley Block	C-C/CB	26 South Central Avenue
Hamilton Patton House	SFR-4	245 Valley View Drive
Hamlin Building (East)	C-C/CB	130 East Main Street
Hamlin Building (West)	C-C/CB	128 East Main Street
Haskins Drug Store	C-C/CB	214 East Main Street
Hight Realty	C-C/CB	221 North Central Avenue
Holly Apartments	C-C/CB	135 North Holly Street
Holly Theater	C-C/CB	226 West 6th Street
Holly Court Apartments	C-C/CB	240 North Holly Street
Home Telephone & Telegraph	C-C/CB	218 West 6th Street
Hoover-Cooper Building	C-C/CB	232 East Main Street
Hotel Medford Sample Rooms	C-C/CB	23 North Ivy Street
Hubbard Brothers Hardware-Woods Blk.	C-C/CB	335 East Main Street
Huggins & Robinson Auto	C-C/CB	32 South Bartlett Street
J.C. Penney's	C-C/CB	102 North Central Avenue
J.H. Thorndike House	C-C/CB	221 North Holly Street
Jackson County Courthouse	C-S/P	10 South Oakdale Avenue

## ENVIRONMENTAL ELEMENT

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<b>HISTORIC NAME</b>	<b>ZONE</b>	<b>ADDRESS</b>
Jackson County Bank Building	C-C/CB	2 North Central Avenue
James W. Bass House	C-C/CB	215 North Ivy Street
Jerome Building - Auto Parts & Supply	C-C/CB/BC	3 South Riverside Avenue
Jerome Building - Eastside Pharmacy	C-C/CB/BC	3 South Riverside Avenue
John F. White Building	C-C/CB	207 West Main Street
Johnson-Childers Building	C-C/CB	318 East Main Street
Kay Building	C-C/CB	34 South Fir Street
Leverette Block	C-C/CB	117 South Central Avenue
Library Park (Alba Park)	C-SP/CB	North Holly & West Main Streets
McAndrews-Barnum Block (West)	C-C/CB	315 East Main Street
McAndrews-Barnum Block (East)	C-C/CB	317 East Main Street
Medford Carnegie Library	C-SP/CB/H	413 West Main Street
Medford Plaza Apartments NOT ON NATIONAL REGISTER	C-SP/CB	235 South Oakdale Avenue
Medford Central Market	C-C/CB	127 North Central Avenue
Medford IOOF Cemetery	SFR-6	Siskiyou Boulevard
Medford Furniture & Hardware Building	C-C/CB	29 North Central Avenue
<del>Medford Hotel</del> <i>delisted</i>		<del>406 West Main Street</del>
Meeker-Stang Building	C-C/CB	231 East Main Street
Meydinski-Palmer Building	C-C/CB	134 East Main Street
Moore Annex-Pottenger Building	C-C/CB	123 West Main Street
P.T. Young/Humphrey Motors	C-C/CB/BC	33 South Riverside Avenue
Pacific Telephone & Telegraph	C-C/CB	145 North Bartlett Street
Pacific Greyhound Bus Depot	C-C/CB	212 North Bartlett Street
Pacific-Record Herald Building	C-C/CB	324 West 6th Street
Palm Rental Store	C-C/CB	20 South Fir Street
Palm (Goldy) Building	C-C/CB	107 East Main Street
Palm-Niedermeyer Building	C-C/CB	132 West Main Street
Pinnacle Packing Plant # 3	C-G/CB	220 North Fir Street
Presbyterian Church	C-C/CB	85 South Holly Street
Raymond H. Toft House	C-C/CB	243 North Holly Street

## ENVIRONMENTAL ELEMENT

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<b>HISTORIC NAME</b>	<b>ZONE</b>	<b>ADDRESS</b>
Richfield Station	C-C/CB	145 North Central Avenue
Root-Slover House	C-C/CB	203 North Holly Street
Roots-Banks House	C-C	11 North Peach Street /1000 W. Main
Safeway/Littrell Building	C-C/CB	313 East Sixth Street
Sam Jennings Building	C-C/CB	229 North Riverside Avenue
Schuler Apartment Building	C-C/CB	38 North Oakdale Avenue
Shone-Charley House	MFR-20/H	305 North Grape Street
Sophenia Ish (Ashpole) House		902 West McAndrews Road
Southern Pacific Rail Passenger Depot	C-C/CB	147 North Front Street
Sparta Building	C-C/CB	12 North Riverside Avenue
St. Mark's Church	C-C/CB	212 North Oakdale Avenue
Stewart Building	C-C/CB	237 East Main Street
Taylor-Phipps Building	C-C/CB	221 East Main Street
Thomas Building No. 2 (Oregon Rooms)	C-C/CB	225 West Main Street
U.S. Post Office - Courthouse	C-C/CB/H	310 West 6th Street
Vawter-Brophy Building	C-C/CB	209 East Main Street
Warner, Wortman & Gore Building	C-C/CB	307 East Main Street
Weeks & Orr Furniture	C-C/CB	114 West Main Street
West Side Feed & Sale Stable	C-C/CB/H	29 South Grape Street
Wilkenson-Swem Building	C-C/CB/H	217 East Main Street
Woodman of the World	C-C/CB	143 North Grape Street

### **SOUTH OAKDALE HISTORIC DISTRICT**

<b>HISTORIC NAME</b>	<b>ZONE</b>	<b>ADDRESS</b>
	C-SP/H	326 South Oakdale Avenue
	C-SP/H	358 South Oakdale Avenue
	C-SP/H	408 South Oakdale Avenue
	C-SP/H	412 South Oakdale Avenue
	SFR-10/H	418 South Oakdale Avenue
	SFR-10/H	426 South Oakdale Avenue

## ENVIRONMENTAL ELEMENT

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### SOUTH OAKDALE HISTORIC DISTRICT

<b>HISTORIC NAME</b>	<b>ZONE</b>	<b>ADDRESS</b>
	SFR-10/H	503 South Oakdale Avenue
	SFR-10/H	504 South Oakdale Avenue
	SFR-10/H	507 South Oakdale Avenue
	SFR-10/H	511 South Oakdale Avenue
	SFR-10/H	512 South Oakdale Avenue
	SFR-10/H	518 South Oakdale Avenue
	SFR-10/H	519 South Oakdale Avenue
	SFR-10/H	522 South Oakdale Avenue
	SFR-10/H	608 South Oakdale Avenue
	SFR-10/H	609 South Oakdale Avenue
	SFR-10/H	610 South Oakdale Avenue
	SFR-10/H	611 South Oakdale Avenue
	SFR-10/H	615 South Oakdale Avenue
	SFR-10/H	616 South Oakdale Avenue
	SFR-10/H	619 South Oakdale Avenue
	SFR-10/H	620 South Oakdale Avenue
	SFR-10/H	701 South Oakdale Avenue
	SFR-10/H	704 South Oakdale Avenue
	SFR-10/H	705 South Oakdale Avenue
	SFR-10/H	706 South Oakdale Avenue
	SFR-10/H	707 South Oakdale Avenue
	SFR-10/H	710 South Oakdale Avenue
	SFR-10/H	714 South Oakdale Avenue
	SFR-10/H	715 South Oakdale Avenue
	SFR-10/H	718 South Oakdale Avenue
	MFR-20/H	800 South Oakdale Avenue
	SFR-10/H	810 South Oakdale Avenue
	SFR-10/H	815 South Oakdale Avenue
	SFR-10/H	822 South Oakdale Avenue
	SFR-10/H	900 South Oakdale Avenue

## **ENVIRONMENTAL ELEMENT**

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### **SOUTH OAKDALE HISTORIC DISTRICT**

<b>HISTORIC NAME</b>	<b>ZONE</b>	<b>ADDRESS</b>
	SFR-6/H	907 South Oakdale Avenue
	SFR-10/H	912 South Oakdale Avenue
	SFR-6/H	922 South Oakdale Avenue
	SFR-6/H	989 South Oakdale Avenue
	SFR-6/H	995 South Oakdale Avenue
	SFR-6/H	1001 South Oakdale Avenue
	SFR-6/H	1002 South Oakdale Avenue
	SFR-6/H	1006 South Oakdale Avenue
	SFR-6/H	1009 South Oakdale Avenue
	SFR-6/H	1010 South Oakdale Avenue
	SFR-6/H	1013 South Oakdale Avenue
	SFR-6/H	1018 South Oakdale Avenue
	SFR-6/H	1019 South Oakdale Avenue
	SFR-6/H	1100 South Oakdale Avenue
	SFR-6/H	1101 South Oakdale Avenue
	SFR-6/H	1108 South Oakdale Avenue
	SFR-6/H	1113 South Oakdale Avenue
	SFR-6/H	1114 South Oakdale Avenue
	SFR-6/H	1120 South Oakdale Avenue
	SFR-6/H	1121 South Oakdale Avenue
	C-SP/H	517 West 10th Street
	SFR-10	511 Dakota Avenue
	SFR-10	516 Belmont Avenue

### **GENEVA-MINNESOTA HISTORIC DISTRICT**

<b>HISTORIC NAME</b>	<b>ZONE</b>	<b>ADDRESS</b>
	C-S/P	801 East Main Street
	C-S/P	815 East Main Street
	C-S/P	8 Geneva Street

## ENVIRONMENTAL ELEMENT

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### GENEVA-MINNESOTA HISTORIC DISTRICT

<b>HISTORIC NAME</b>	<b>ZONE</b>	<b>ADDRESS</b>
	SFR-6	15 Geneva Street
	SFR-6	16 Geneva Street
	SFR-6	19 Geneva Street
	SFR-6	21 Geneva Street
	SFR-6	22 Geneva Street
	SFR-6	27 Geneva Street
	SFR-6	28 Geneva Street
	SFR-6	31 Geneva Street
	SFR-6	32 Geneva Street
	SFR-6	35 Geneva Street
	SFR-6	38 Geneva Street
	SFR-6	101 Geneva Street
	SFR-6	104 Geneva Street
	SFR-6	105 Geneva Street
	SFR-6	108 Geneva Street
	SFR-6	109 Geneva Street
	SFR-6	112 Geneva Street
	SFR-6	113 Geneva Street
	SFR-6	Geneva Street Roadbed
	SFR-6	813 Minnesota Avenue
	SFR-6	819 Minnesota Avenue
	SFR-6	821 Minnesota Avenue
	SFR-6	822 Minnesota Avenue
	SFR-6	826 Minnesota Avenue
	SFR-6	828 Minnesota Avenue
	SFR-6	829 Minnesota Avenue
	SFR-6	830 Minnesota Avenue
	SFR-6	831 Minnesota Avenue
	SFR-6	832 Minnesota Avenue
	SFR-6	836 Minnesota Avenue

## **ENVIRONMENTAL ELEMENT**

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### **GENEVA-MINNESOTA HISTORIC DISTRICT**

<b>HISTORIC NAME</b>	<b>ZONE</b>	<b>ADDRESS</b>
	SFR-6	839 Minnesota Avenue
	SFR-6	31 Crater Lake Avenue
	SFR-6	35 Crater Lake Avenue
	SFR-6	101 Crater Lake Avenue
	SFR-6	103 Crater Lake Avenue
	SFR-6	107 Crater Lake Avenue

## ENVIRONMENTAL ELEMENT

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### 1B LIST POTENTIALLY SIGNIFICANT HISTORIC RESOURCES CITY OF MEDFORD

NOT LISTED ON THE HISTORIC REGISTER OR IN A HISTORIC DISTRICT

	<b>HISTORIC NAME</b>	<b>ZONE</b>	<b>ADDRESS</b>
*	American Fruit Growers Warehouse	C-G/CB	102 South Fir Street
	David Holmes House	SFR-4	6 North Modoc Avenue
	Earhart House		945 North Riverside Avenue
	H. Fluhrer House		Portland Avenue
	Hiron Tripp House	C-S/P	11 Tripp Street
*	J.F. Erickson House	C-S/P	231 South Holly Street
	Jackson School	SFR-10	630 West Jackson Street
*	Lewis C. Jenkins House	C-S/P	205 South Holly Street
*	Older Tire Service - Firestone Tire & Rubber		202 South Riverside Avenue
	Powers House & Carriage House	SFR-10	101 Portland Avenue
	Roberts House	SFR-4	1815 Crown Avenue
	Sheppard-Muirhead House	SFR-4	2003 Hillcrest Road
*	Smith-Dynage Lumber Co.	C-G/CB	102 South Fir Street
*	Stoddard-Evanson Duplex	C-S/P	240 South Grape Street
*	Thomas Apartment House	C-S/P	108 South Grape Street
	United Grocers Warehouse		40 East Tenth Street
*	W.G. Gannaway House	C-S/P	232 South Grape Street
*	William Ulrich Rental	C-S/P	141 South Holly Street
*	Wilson Court Apartments	C-S/P	122 South Grape Street
	“Stone” House	SFR-6	1202 East Main Street

\* Listed on the “*Survey of Historic & Cultural Resources - Downtown Commercial Area - Phase I and Phase II*” as a primary resource.

**SIGNIFICANT HISTORIC RESOURCES  
MEDFORD URBAN GROWTH BOUNDARY**

<b>HISTORIC NAME</b>	<b>ADDRESS</b>
Robert Vinton Beall House	1253 Beall Lane
Bear Creek Orchard Packing House	2518 South Pacific Highway
Leonard Carpenter House	2895 Hillcrest Road

**SIGNIFICANT HISTORIC RESOURCES  
NEAR MEDFORD URBAN GROWTH BOUNDARY  
(LISTED ON THE NATIONAL REGISTER)**

<b>HISTORIC NAME</b>	<b>ADDRESS</b>
Prescott Park Facilities (City of Medford Owned)	Roxy Ann Butte
Frederic E. Furry House	1720 North Phoenix Road 371W33 1000 1,500 feet Southwest of Coal Mine Road - North Phoenix Road Intersection
Hillcrest Orchard Historic District	3285 Hillcrest Road
John W. Merritt Store and Residence	117 East Pine Street, Central Point 372W10AA 200
Conro Fiero House (Mon Desir Restaurant)	4615 Hamrick Road, Central Point 372W01B 4000 West of Table Rock Road

## APPENDIX C

### **Medford Local Wetlands Inventory and Locally Significant Wetland Determinations**

The document “*Medford Local Wetlands Inventory and Locally Significant Wetland Determinations, September 2002*” prepared by Wetland Consulting of Portland, Oregon was adopted by the Medford City Council on April 17, 2003. This document was prepared and adopted pursuant to Goal 5 of the Oregon Statewide Planning Goals and the Oregon Revised Statutes (ORS). The Locally Significant Wetlands are considered “Goal 5 Significant Resources”.

The contents of the document, including the Local Wetland Inventory (LWI) maps, are on file in the City of Medford Planning Department. The Local wetland Inventory Maps are also available for viewing on the City of Medford website ([www.ci.medford.or.us](http://www.ci.medford.or.us)) under the Planning Department.

The document contents include:

#### **1.0 INTRODUCTION**

##### **1.1 DEFINITIONS**

##### **1.2 LWI USES AND LIMITATIONS**

#### **2.0 STUDY METHODS**

##### **2.1 LOCAL WETLANDS INVENTORY**

##### **2.2 WETLANDS ASSESSMENT**

##### **2.3 LOCALLY SIGNIFICANT WETLANDS DETERMINATIONS**

#### **3.0 STUDY AREA CHARACTERISTICS**

##### **3.1 LOCATION AND SIZE**

##### **3.2 HISTORY**

##### **3.3 LANDSCAPE SETTING AND TOPOGRAPHY**

##### **3.4 HYDROLOGY**

##### **3.5 SOILS**

##### **3.6 VEGETATION**

#### **4.0 LOCAL WETLANDS INVENTORY RESULTS**

##### **4.1 WETLANDS**

##### **4.2 POSSIBLE WETLANDS**

#### **5.0 WETLANDS ASSESSMENT RESULTS**

##### **5.1 WETLANDS OF SPECIAL INTEREST FOR PROTECTION**

##### **5.2 WETLAND FUNCTIONS AND CONDITIONS ASSESSMENT RESULTS**

#### **6.0 LOCALLY SIGNIFICANT WETLANDS RESULTS**

#### **7.0 POTENTIAL WETLAND MITIGATION AND RESTORATION SITES**

#### **8.0 STUDY AREA SUMMARY**

#### **9.0 REFERENCES**

#### **GLOSSARY**

**APPENDIX C - Medford Local Wetlands Inventory and Locally Significant Wetland Determinations - Continued**

***Tables***

- Table 1. OFWAM Wetland Functions and Conditions
- Table 2. Locally Significant Wetlands Criteria
- Table 3. Soils Mapped in the Study Area With Hydric Components
- Table 4. Dominant Plant Species Associated with Medford Wetlands
- Table 5. Wetland/Upland Mosaics
- Table 6. Excavated Ponds (0.5 Acres and Larger)
- Table 7. OFWAM Results
- Table 8. Locally Significant Wetlands Results
- Table 9. Potential Wetland Mitigation and Restoration Sites
- Table 10. Study Area Summary

***Figures***

- Figure 1. OFWAM Process
- Figure 2. Study Area Location
- Figure 3. Landscape Setting
- Figure 4. Middle Rogue Hydrologic Unit
- Figure 5. Medford Drainage Basins

***Appendices***

- APPENDIX A. TECHNICAL STAFF QUALIFICATIONS
- APPENDIX B. WETLAND SUMMARY SHEETS
- APPENDIX C. LOCAL WETLAND INVENTORY MAPS
- APPENDIX D. OFWAM WETLANDS OF SPECIAL INTEREST FOR PROTECTION
- APPENDIX E. OFWAM WETLAND CHARACTERIZATION RESULTS
- APPENDIX F. OFWAM WETLAND ASSESSMENT RESULTS
- APPENDIX G. OFWAM WETLAND FUNCTION AND CONDITION SUMMARY SHEETS
- APPENDIX H. LOCALLY SIGNIFICANT WETLANDS CHECKLISTS
- APPENDIX I. POTENTIAL WETLAND MITIGATION AND RESTORATION SITES MAP

**APPENDIX D  
ENVIRONMENTAL AGENCIES, LAWS  
AND REGULATIONS**

**Biology, Water Resources, Wetlands**

**Oregon Department of Fish and Wildlife (ODFW)**

District Office  
1495 Gregory Road  
Central Point, OR 97502

**Oregon Division of State Lands (DSL)**

775 Summer Street NE  
Salem, OR 97301  
(503) 378-3805

**Oregon Department of Environmental Quality (DEQ)**

Western Region - Medford  
201 West Main Street #2D  
Medford, OR 97504  
(541) 776-6010

**Federal Endangered Species Act (1973)**

50 CFR 402

Requires the protection of federally-designated threatened and endangered animal and plant species. Avoidance of taking individuals or jeopardizing populations is required. Agencies are required under Section 7 to consult with appropriate federal resource agencies before taking action.

**Oregon Endangered Species Act (1987)**

OAR 603-73... and 496 et seq.

Establishes a program for the protection and conservation of wildlife and plant species that are threatened or endangered. Requires state agencies to inventory populations on state lands and establish protection and conservation programs.

**Waterway Habitat Policies**

ORS 496...506... and 635...

Various Oregon statutes that charge Oregon Department of Fish and Wildlife with the protection of fish and wildlife habitat.

**Executive Order 11990 and U.S. DOT Order 5660.1A (1977)**

23 CFR 777

Declares that it is the policy of the federal government to avoid new construction in wetlands and to minimize their destruction.

**Clean Water Act (1972, 1977, 1987)**

33 USC 1251, 1342, & 1344 and 33 CFR 230 and 40 CFR 131

## **ENVIRONMENTAL ELEMENT**

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This umbrella legislation covers the protection of waters of the U.S. including wetlands. It establishes various programs, such as the National Pollution Discharge Elimination System (NPDES), an indirect source control program, the 404 Process, and permitting programs for controlling pollution and fill in wetlands and deep water habitat.

### **Oregon Removal-Fill Law**

ORS 196.800-196.990

Regulates the removal of material from the beds and banks of, and the filling of the waters of the state.

### **Oregon Freshwater Wetland Compensatory Mitigation Rules**

OAR 141-85-005 through 141-85-690

Regulates the removal of material from the beds and banks of, and filling of the waters of the state, including wetlands. Requires a review for avoidance, need, and mitigation of effects of fills and removals, particularly in wetlands.

### **Executive Order 11988 and Location and Hydraulic Design of Encroachments on Floodplains**

FHPM 6-7-3-2 (1984)

Requires Federal agencies to avoid adverse impacts associated with the occupancy and modification of floodplains. They must further avoid support of floodplain development wherever there are practicable alternatives.

### **Executive Memorandum on Environmentally Beneficial Landscaping (1977, 1979)**

### **Oregon Standards and Criteria for Stream-Road Crossings**

ORS 498.351 and ORS 509.605

## **Cultural, Social, Land Use, Aesthetics**

### **Oregon State Historic Preservation Office (SHPO)**

1115 Commercial Street NE

Salem, OR 97310-5001

(503) 378-5001

### **Executive Order 11593 and National Historic Preservation Act (1971)**

36 CFR et seq. and 36 CFR 66

Establishes national policy to identify and protect cultural resources, and historic and archaeological sites. Requires agencies to inventory significant properties and address impacts. Requires concurrence of State Historic Preservation Officer and the President's Advisory Council on Historic Places before commencing with actions that may cause impact.

### **Native American Graves Protection and Repatriation Act (1990)**

43 CFR 10

Gives rights to lineal descendants and Native American tribes regarding human remains, funerary objects, sacred objects, or objects of cultural patrimony with which they are affiliated.

## **ENVIRONMENTAL ELEMENT**

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This and other legislation give a high degree of control to Native Americans over archaeological site mitigation and protection.

### **Oregon Statewide Planning Goals (1973) and Land Use Planning Program**

Oregon Department of Land Conservation and Development (DLCD)

Establishes Oregon's land use planning program. Requires the identification of certain land use categories and natural resources, and the development of mechanisms for their protection. Also requires the development of agency land use coordination agreements that spell out how state agencies will pursue their missions while fulfilling the goals of the land use program.

### **Noise, Air Quality, and Hazardous Materials**

#### **Jackson County Health and Human Services - Environmental Health Services**

1005 East Main Street, Bldg. A

Medford, OR 97504

(Air Quality) (541) 776-7318

(Open Burning Advisory) (541) 776-7007

(Wood Burning Advisory) (541) 776-9000

#### **Rogue Valley Inspection and Maintenance (I & M) Testing Station**

3030 Biddle Road

Medford, OR 97504

#### **Abatement of Highway Traffic and Construction Noise**

Federal High Way Administration (FHWA) FHPM 7-7-3

Establishes FHWA policies on noise analysis, disclosure, and mitigation. Supplies noise abatement criteria. Directs the sharing of information with local government officials for use in planning and design.

#### **Clean Air Act, (1970, last amended 1990), EPA/DOT Conformity Guidance, Air Quality Conformity and Priority Procedures for Use in Federal-Aid Highway and Federally-Funded Transit Programs (1984)**

42 USC 7401 et seq., FHPM 7-7-9

The Clean Air Act established a national policy on controlling air pollution. The 1990 Amendments to the Clean Air Act attempt to limit air pollution through changes to industrial operations, advanced control technologies, and community action.

#### **Oregon Air Pollution Control Laws**

OAR 340-20-710 et seq.

**APPENDIX E  
2016 URBAN RESERVE LOCAL WETLAND INVENTORY**

**(PAPER COPY AVAILABLE AT THE PLANNING DEPARTMENT)**

**AVAILABLE ON THE STATE'S WEBSITE**

<https://docs.dsl.state.or.us/PublicReview/ElectronicFile.aspx?docid=3117200&&dbid=0>

**APPENDIX F  
SITE SPECIFIC ESEE ANALYSIS FOR LOCALLY SIGNIFICANT  
WETLANDS IDENTIFIED IN THE 2016 LOCAL WETLAND  
INVENTORY**

The following site-specific Economic, Social, Environmental, and Energy (ESEE) analysis has been conducted addressing how conflicting uses, if allowed, could adversely impact each significant wetland resource and how the wetland may impact proposed uses. The wetlands are located in both proposed Urban Growth Boundary expansion areas as well as Urban Reserves. A partnership and agreement with Jackson County on how to manage the protection or impacts of these wetlands will be very important over the long term. Information below is based on wetland summary sheets found in the 2016 Medford Urban Reserve Local Wetland Inventory report, the 2018 Urban Growth Boundary amendment comprehensive plan designations, proposed and conceptual transportation plans, the 2016 Leisure Services Plan, floodplain and riparian corridor data, and County zoning.

**Locally Significant Wetlands**

The 2016 Local Wetland Inventory provides information on the locally significant wetland criteria found for each wetland. Wetlands within the Medford Urban Reserves and 2018 Urban Growth Boundary are considered *significant* if, through the Oregon Freshwater Wetland Assessment Methodology (OFWAM) evaluation yes is the answer to any of the following questions:

1. Does the wetland provide diverse wildlife habitat?
2. Is the wetland's fish habitat function intact?
3. Is the wetland's water quality function intact?
4. Is the wetland's hydrologic control function intact?
5. Is the wetland less than ¼ mile from a water body listed by DEQ as a water quality limited water body (303(d) list) and is the wetland's water quality function intact, or impacted or degraded?
6. Does the wetland contain a rare plant community?

## **ENVIRONMENTAL ELEMENT**

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7. Is the wetland inhabited by any species listed federally as threatened or endangered, or state listed as sensitive, threatened or endangered?
8. Does the wetland have a direct surface water connection to a stream segment mapped by ODFW as habitat for indigenous anadromous salmonids and is the wetland's fish habitat function intact, or impacted or degraded?

### **High and Moderate Quality Wetlands**

The analysis further designates a quality ranking of either High or Moderate to the locally significant wetlands. High quality wetlands are designated using a combination of key assessment variables (functions and values) used to determine wetland significance. High Quality Wetlands are locally significant wetlands that provide highly rated ecological functions and have at least one of the following characteristics:

1. Have at least two "high" OFWAM function ratings (i.e., diverse wildlife habitat, intact fish habitat, intact water quality function, or intact hydrologic control function); or
2. Contain one or more rare plant communities; or
3. Provide habitat for listed species; or
4. Connect directly to a salmon-bearing stream.

Moderate quality wetlands are categorized as those locally significant wetlands that do not meet the above criteria.

The ESEE analysis starts in reverse MD order starting in MD-6 and ending in MD-1.

### **Site 1: MD-6 (Bear Creek South - South Stage Road)**

The Bear Creek South site contains two significant wetlands, W-19A and W-19B. These wetlands are located in MD-6 southeast, west of South Pacific Highway and north of South Stage Road. These wetlands have the following characteristics:

Wetland IDs:	W19-A & W19-B
OFWAM Grouping Code:	BCS-7
Watershed Boundary:	Larson Creek-Bear Creek
Wetland Size:	7.24 acres
Number of Parcels Affected:	7
Combined Parcel Area:	111.78 acres
Key Assessment Variable:	Hydrologic Control
Quality Determination:	<b>Moderate</b>

## ENVIRONMENTAL ELEMENT

### Summary of Affected Parcels

Wetland/ Tax Lot	Parcel (acres)	UGB or UR	Medford GLUP Map	County Zoning/ Overlay	Flood-plain	Current Use(s)
W19-A						
381W05 4800	22.62	UGB	Commercial	Exclusive Farm Use	N/A	Vacant
381W05B 2000	2.55	UR	N/A	Rural Residential (RR-5)	N/A	Partially Improved
381W05 1300	2.38	UR	N/A	Rural Residential (RR-5)	N/A	Vacant
381W05 2400	81.70	UGB	Heavy Industrial	Light Industrial	N/A	Improved
W19-B						
381W05 4800	22.62	UGB	Commercial	Exclusive Farm Use	N/A	Vacant
381W05B 2100	1.37	UGB	Commercial	Rural Residential (RR-5)	N/A	Improved
381W05B 2200	0.50	UGB	Commercial	Rural Residential (RR-5)	N/A	Vacant
381W05C 800	0.66	UGB	Commercial	Rural Residential (RR-5)	N/A	Improved

### Distinguishing Site Characteristics

W19-A is located over a large area with varying topography. It is fed by groundwater and ditches in some portions. Both wetlands are connected to each other by a culvert under Reed Lane. Additional wetlands that are not locally significant also are present in the southeast portion of tax lot 4800 and extend into the Urban Reserve properties along Starlite Lane.

### Conflicting Uses

The following conflicting uses apply within this resource site and its impact area.

Urban Residential	
Urban Medium Residential	
Urban High Residential	
<b>Commercial</b>	<b>X</b>
Service Commercial	
<b>Heavy Industrial</b>	<b>X</b>
General Industrial	
Parks and Schools	

## ENVIRONMENTAL ELEMENT

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<b>Public Facilities</b>	<b>X</b>
Greenway Corridor	
<b>Vegetation removal and grading</b>	<b>X</b>

### Economic Consequences

The proposed General Land Use Plan designations for these areas include Heavy Industrial and Commercial. Development of these properties is intended to meet future land needs that will accommodate industrial and commercial uses. Fully protecting these wetlands could have adverse economic impacts on adequately developing these properties. Although no higher order streets are proposed in this location, the extension of local streets and utilities may be required in order to serve future development causing disturbance to the wetlands. Impacts to the wetlands shall be minimized to the extent possible.

### Social Consequences

The wetlands could provide a green space or buffer between the proposed commercial and industrial developments and the existing residential properties that surround them. The wetlands could be incorporated to serve as a connection between the different types of development.

### Environmental Consequences

By allowing conflicting uses fully within the wetlands would mean the loss of wetlands ranked moderate for hydrologic control. Development plans that identify ways to limit conflicts or use low impact development strategies could protect some of the wetland functions but there are inherent conflicts between the location of the wetlands and opportunities to develop the properties that will result in the loss of wetlands to some degree.

### Energy Consequences

There are no energy consequences identified.

### **Goal 5 Recommendation**

Allow but reduce, to the extent possible, impacts to the wetlands.

## **Site 2: MD-5 (Bear Creek South – South of Interstate 5)**

This site contains two significant wetlands, W-18 and W-79. These wetlands are located in MD-5 southwest, south of Interstate 5. These wetlands have the following characteristics:

Wetland IDs:	W18 & W79
OFWAM Grouping Code:	BCS-5
Watershed Boundary:	Larson Creek-Bear Creek
Wetland Size:	3.78 acres
Number of Parcels Affected:	1
Combined Parcel Area:	11.62 acres
Key Assessment Variable:	Wildlife Habitat, Fish Habitat, Connects to Bear Creek
Quality Determination:	<b>High</b>

## ENVIRONMENTAL ELEMENT

### Summary of Affected Parcels

Wetland/ Tax lot	Parcel (acres)	UGB or UR	Medford GLUP Map	County Zoning/Overlay	Floodplain	Current use(s)
W18 & W79						
381W04 401	11.62	UGB	Parks and Schools	Exclusive Farm Use (EFU)	Yes	Vacant (Adjacent to the Bear Creek Greenway)

### Distinguishing Site Characteristics

W18 is a Bear Creek Greenway wetland from ODOT Salmon Resource and Sensitive Area Mapping survey (SRSAM) in 2004. This wetland extends offsite and connects to wetland W79, a riparian wetland along the creek also. The wetlands are located on property owned by Jackson County and located north and east of the greenway trail. The City's riparian corridor along Bear Creek terminates at this tax lot and could be extended to encapsulate the identified wetlands. The property to the south is developed with the Medford Estates Mobile Home Park.

### Conflicting Uses

The following conflicting uses apply within this resource site and its impact area.

Urban Residential	
Urban Medium Residential	
Urban High Residential	
Commercial	
Service Commercial	
Heavy Industrial	
General Industrial	
Parks and Schools	
Public Facilities	
<b>Greenway Corridor</b>	<b>X</b>
<b>Vegetation removal and grading</b>	<b>X</b>

### Economic Consequences

Fully protecting these wetlands in this location is optimal. The site is publicly owned by Jackson County and is part of the Bear Creek Greenway network. The location provides opportunities to extend the City's riparian corridor, Parks and Schools General Land Use Plan designations and Greenway overlay to ensure public benefit and wetland protection in the long term.

## **ENVIRONMENTAL ELEMENT**

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### Social Consequences

The site is vacant and not impacted by development. It includes a portion of the Bear Creek Greenway trail which serves regionally as a transportation and recreational corridor. Its continued use as a greenway and as a natural area are important to the livability of the citizens and visitors of Medford and surrounding communities.

### Environmental Consequences

The site contains a section of Bear Creek and its associated mapped floodplain which extends to the majority of the property. The site is bordered by Interstate 5 to the east and limited emergency vehicle access from the Bear Creek Greenway trail. The location and existing site constraints limit future development beyond its use as a greenway corridor making it a likely candidate for protection of the wetlands and an extension of the riparian corridor.

### Energy Consequences

Maintaining this site in its current conditions to the extent possible enhances and protects the functions of the Creek, the existing vegetation, and wetlands. It maintains flood storage capacity by retaining the natural floodplain boundaries of the creek. The vegetation provides shade and protection to wildlife within and surrounding the creek.

### **Goal 5 Recommendation**

Protect the wetlands and extend the existing riparian corridor overlay within this parcel to encompass the wetland areas and natural functions of the creek.

### **Site 3: MD-5 (Bear Creek South – North of Interstate 5)**

This site contains four significant wetlands, W70, W71, W72, and W74. These wetlands are located in MD-5 southwest, north of Interstate 5. These wetlands have the following characteristics:

Wetland IDs:	W70, W71, W72, & W74
OFWAM Grouping Code:	BCS-4
Watershed Boundary:	Larson Creek-Bear Creek
Wetland Size:	12.94 acres
Number of Parcels Affected:	2
Combined Parcel Area:	149.08 acres
Key Assessment Variable:	Water Quality, Hydrologic Control
Quality Determination:	<b>High</b>

## ENVIRONMENTAL ELEMENT

### Summary of Affected Parcels

Wetland/ Tax lot	Parcel (acres)	UGB or UR	Medford GLUP Map	County Zoning/Overlay	Floodplain	Current use(s)
W70						
381W04 400	56.76	UGB	General Industrial	Exclusive Farm Use (EFU)	N/A	Structures on site, Mostly undeveloped
381W04 501	92.32	UGB	Service Commercial	Exclusive Farm Use (EFU)	N/A	Structure on site, Mostly undeveloped
W71, W72, and W74						
381W04 400	56.76	UGB	General Industrial and Service Commercial	Exclusive Farm Use (EFU)	N/A	Structures on site, Mostly undeveloped

### Distinguishing Site Characteristics

W70 is a National Wetland Inventory (NWI) mapped wetland located east of I-5 in flood irrigated pasture with extensive ditching throughout. It connects to two water bodies identified as WA08 and WA22. W71 is located on the southwest edge of a flood irrigated field which also has extensive ditching throughout. There are limited outlets due to I-5 bordering on the western edge and is connected to wetland W72. Wetland W72 is also from NWI map data and is located in a pasture and is connected to a ditch that runs along the southern edge of the parcel. It has potential for connection to waterbody WA25 to the east and has outflow to the west via a ditch. There are mapped significant wetlands from the 2002 inventory on the adjacent tax lot to the west (t.l. 300). Bear Creek Orchards hired Montero, Cafferata Consulting LLC, and Schott and Assoc. to delineate the wetlands on tax lot 501. The delineation was submitted to DSL for review and approval. The delineation was included as an attachment in the Local Wetland Inventory document. (Permit #WD2015-0492 (approved with revisions))

### Conflicting Uses

The following conflicting uses apply within this resource site and its impact area.

Urban Residential	
Urban Medium Residential	
Urban High Residential	
Commercial	
<b>Service Commercial</b>	<b>X</b>
Heavy Industrial	
<b>General Industrial</b>	<b>X</b>
Parks and Schools	
<b>Public Facilities</b>	<b>X</b>
Greenway Corridor	

## ENVIRONMENTAL ELEMENT

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Vegetation removal and grading	X
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### Economic Consequences

Future transportation networks and utility extensions are proposed along the northern property line of tax lot 400 with the extension of South Stage Road from the west as well as the north-south street extension of Golf View Drive that crosses both tax lots. Adjustments to shift Golf View Drive to the east could lessen the impact to wetland W70 and should be considered as an alternative. There is potential to maintain the high quality wetlands along the I-5 edge (W71 and W72) as future street connections are not anticipated and access to the site from I-5 is unlikely. Impacts due to future street locations may affect the wetlands and shall be permitted but reduced as much as possible.

### Social Consequences

The wetlands have recreational and aesthetic values providing opportunities for open space and potential walking and biking amenities that could connect to the Bear Creek Greenway and development within the residential lands to the north. Limiting conflicting uses and using the wetlands as assets to balance the social values versus the development opportunities are important.

### Environmental Consequences

The wetlands are determined to be high quality so completely permitting the conflicting industrial and commercial uses would result in a loss to these wetlands and the functions of water quality and hydrologic control they provide. These wetlands were identified as unbuildable in the evaluation of the Urban Growth Boundary expansion however considerations for street and utility connections need to be evaluated to allow these uses but reduce their impact on the wetlands.

### Energy Consequences

On balance with the natural functions of the wetlands, future street connectivity between the east and west side of I-5 and north-south routes are important in creating more direct routes for vehicles and more opportunities for walking and biking.

### **Goal 5 Recommendation**

Allow but reduce, to the extent possible, impacts to the wetlands. Impacts are likely to occur with wetlands W71 and W74. Opportunities to protect wetlands W71 and W72 are more probable.

### **Site 4: MD-5 (Larson Creek South – East of Santa Barbara Drive)**

This site contains two wetlands W13 and W66 located northeast of the intersection of Coal Mine Road and Santa Barbara Drive. These wetlands have the following characteristics:

Wetland IDs:	W13 and W66
OFWAM Grouping Code:	BS-2
Watershed Boundary:	Larson Creek- Bear Creek
Wetland Size:	1.75 acres

## ENVIRONMENTAL ELEMENT

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Number of Parcels Affected: 1  
 Combined Parcel Area: 166.21 acres  
 Key Assessment Variable: Within ¼ mile of Larson Creek  
 Quality Determination: **Moderate**

### Summary of Affected Parcels

Wetland/ Tax lot	Parcel (acres)	UGB or UR	Medford GLUP Map	County Zoning/Overlay	Floodplain	Current use(s)
W13 & W66						
371W35 126	166.21	UR	N/A	Exclusive Farm Use (EFU)	Not Mapped	Vacant

### Distinguishing Site Characteristics

Both wetlands are located in a valley and boundaries were copied from the National Wetland Inventory (NWI) mapping data. The wetlands are connected to Larson Reservoir (AW21). The property is not proposed to be included in the 2016 Urban Growth Boundary expansion.

### Conflicting Uses

The following conflicting uses apply within this resource site and its impact area.

Urban Residential	
Urban Medium Residential	
Urban High Residential	
Commercial	
Service Commercial	
Heavy Industrial	
General Industrial	
Parks and Schools	
<b>Public Facilities</b>	<b>X</b>
Greenway Corridor	
<b>Vegetation removal and grading</b>	<b>X</b>

### Economic Consequences

The property is currently zoned Exclusive Farm use and will be under County jurisdiction well into the future. The impacts of urban development are not yet anticipated as the site will remain in the Urban Reserve and subject to County regulations. Higher order streets are planned along Santa Barbara Drive and Coal Mine Road. Wetland W66 crosses an access road to a residence to the east. The grading, graveling, or paving of this existing access road is likely to occur as necessary. The street and utility facilities could impact these wetlands in the future but protecting them until those improvements happen is possible.

## ENVIRONMENTAL ELEMENT

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### Social Consequences

A fork of Larson Creek is north of the wetlands and an extension of planned pedestrian and bike paths along its bank are likely, providing educational, recreational, and aesthetic benefits by limiting conflicting uses at this site.

### Environmental Consequences

There is opportunity to protect the majority of these wetlands identified. Allowing but reducing conflicting uses for these moderate quality wetlands in the location of the access road and protecting the other can conserve the wetland functions.

### Energy Consequences

There are no energy consequences identified.

### **Goal 5 Recommendation**

Allow but reduce impacts to the wetlands. It is recommended the two wetlands be protected in the long term except in the areas of the existing private access road. Transportation and utility extensions in the future may necessitate further impacts to these wetlands.

### **Site 5: MD-5 (Larson Creek North– South of Cherry Lane)**

This site contains two wetlands W14 and W15 located southeast of Cherry Lane. These wetlands have the following characteristics:

Wetland IDs:	W14 and W15
OFWAM Grouping Code:	LSC-1 and LSC-2
Watershed Boundary:	Larson Creek – Bear Creek
Wetland Size:	2.64 acres
Number of Parcels Affected:	1
Combined Parcel Area:	163.63 acres
Key Assessment Variable:	Water Quality
Quality Determination:	<b>Moderate</b>

### Summary of Affected Parcels

Wetland/ Tax lot	Parcel (acres)	UGB or UR	Medford GLUP Map	County Zoning/Overlay	Floodplain	Current use(s)
W14 & W15						
371W26 104	163.63	UGB and UR	Urban Residential (UR)	Exclusive Farm Use	Not mapped	Residence

### **Distinguishing Site Characteristics**

Wetland W15 connects to Larson Creek, a spur from the North Fork of Larson Creek.

Wetland W14 is separated by W15 by a road. The site is grazed and impacted by cattle. Other not locally significant wetlands (W63 and W64) are identified. W15 and W63 were determined to be connected based on the riparian corridor of Larson Creek.

## ENVIRONMENTAL ELEMENT

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### Conflicting Uses

The following conflicting uses apply within this resource site and its impact area.

<b>Urban Residential</b>	<b>X</b>
Urban Medium Residential	
Urban High Residential	
<b>Commercial</b>	<b>X</b>
Service Commercial	
Heavy Industrial	
General Industrial	
Parks and Schools	
Public Facilities	
Greenway Corridor	
<b>Vegetation removal and grading</b>	<b>X</b>

### Economic Consequences

Higher order streets are proposed to the west of the significant wetlands impacting W64 (not locally significant). The existing access road (driveway) into the property will be maintained over time or converted into street and utility access in the future potentially impacting the wetlands. Extension of the riparian corridor is proposed to include the wetlands along Larson Creek and the North Fork of Larson Creek (W14, W15, and W63 (not locally significant)).

### Social Consequences

A pedestrian and bike path intended to connect to Chrissy Park is proposed along the North Fork of Larson Creek which provides recreational and aesthetic benefits. Limiting the conflicting uses of these wetlands will help maintain the integrity of these wetlands.

### Environmental Consequences

Some impacts are likely to these wetlands due to conflicting uses with urban development (transportation, utility and recreational purposes). There are opportunities to limit these conflicts through extension of the riparian corridor protections.

### Energy Consequences

Transportation benefits may be seen both for vehicular and bike/pedestrian users with the addition of new street and trail connections.

### **Goal 5 Recommendation**

It is recommended the wetlands be protected to the extent possible by allowing but reducing conflicting uses. The riparian corridor shall be extended to include W14, W15, and W63.

### **Site 6: MD-3 (Whetstone Creek – Rogue River)**

This site contains twelve wetlands located south of Coker Butte Road and west of N. Foothill Road. These wetlands have the following characteristics:

**ENVIRONMENTAL ELEMENT**

Wetland IDs: W11, W21, W46, W47, W48, W49, W50, W51, W53, W54, W55, W56  
 OFWAM Grouping Code: MWC-6  
 Watershed Boundary: Whetstone Creek – Rogue River  
 Wetland Size: 26.49 acres  
 Number of Parcels Affected: 8  
 Combined Parcel Area: 429.22 acres  
 Key Assessment Variable: Hydrologic Control  
 Quality Determination: **Moderate**

Summary of Affected Parcels

Wetland/ Tax lot	Parcel (acres)	UGB or UR	Medford GLUP Map	County Zoning/Overlay	Floodplain	Current use(s)
W11						
371W09 800	36.35	UR	N/A	Exclusive Farm Use (EFU)	Not Mapped	Residence; Farming
W21						
371W09 2600	99.35	UGB	Urban Residential, Urban High Density Residential, and Commercial	Exclusive Farm Use (EFU)	Not Mapped	Residence; plus additional structures
371W09 2700	58.96	UGB	Urban residential, Urban High Density Residential	Exclusive Farm Use (EFU)	Not Mapped	Vacant
W46						
371W08 800	20.01	UGB	Urban Medium Residential & Urban High Density Residential	Exclusive Farm Use (EFU)	Not Mapped	Farming
W47						
371W08 1000	40.27	UGB	Urban High Density Residential, Service Commercial, and	Exclusive Farm Use (EFU)	Not Mapped	Vacant

**ENVIRONMENTAL ELEMENT**

			Commercial			
371W09 2600	99.35	UGB	Urban Residential	Exclusive Farm Use (EFU)	Not Mapped	Residence; plus additional structures
371W09 900	99.54	UR	N/A	Exclusive Farm Use (EFU)	Not Mapped	Vacant
W48						
371W08 900	35.13	UGB and UR	Urban High Density Residential	Exclusive Farm Use (EFU)	Not Mapped	Vacant
W49						
371W08 900	35.13	UGB and UR	Urban High Density Residential	Exclusive Farm Use (EFU)	Not Mapped	Vacant
371W08 1000	40.27	UGB	Urban High Density Residential, Service Commercial, and Commercial	Exclusive Farm Use (EFU)	Not Mapped	Vacant
371W09 800	36.35	UR	N/A	Exclusive Farm Use (EFU)	Not Mapped	Residence; Farming
371W09 900	99.54	UR	N/A	Exclusive Farm Use (EFU)	Not Mapped	Vacant
W50						
371W08 100	39.61	UR	N/A	Exclusive Farm Use	Not Mapped	Farming
371W08 1000	40.27	UGB	Urban High Density Residential, Service Commercial, and Commercial	Exclusive Farm Use (EFU)	Not Mapped	Vacant
W51						
371W08 1000	40.27	UGB	Urban High Density Residential, Service Commercial, and Commercial	Exclusive Farm Use (EFU)	Not Mapped	Vacant

## ENVIRONMENTAL ELEMENT

371W08 100	39.61	UR	N/A	Exclusive Farm Use	Not Mapped	Farming
371W08 900	35.13	UGB and UR	Urban High Density Residential	Exclusive Farm Use (EFU)	Not Mapped	Vacant
W53, W54, W55, W56, and W57						
371W09 2600	99.35	UGB	Urban Residential, Urban High Density Residential, and Commercial	Exclusive Farm Use (EFU)	Not Mapped	Residence; plus additional structures

### Distinguishing Site Characteristics

Starting on the west side of MD-3, wetland W46 is located at the headwaters of Midway Creek (Upton Slough) and Swanson Creek, on the banks of a pond located within converging arms of Hopkins Canal. This wetland connects to wetland W48. Wetlands W47 and W49 are connected and located at the headwaters of Midway Creek and Swanson Creek. Wetlands W50 and W51 are adjacent to each other and surrounded by an irrigation pond. Wetland W11 is located within a former orchard and is connected to a man-made pond (AW17). Wetlands W21, W53-W57 are located west of N. Foothill Road and interwoven among mapped ditches.

### Conflicting Uses

The following conflicting uses apply within this resource site and its impact area.

<b>Urban Residential</b>	<b>X</b>
<b>Urban Medium Residential</b>	<b>X</b>
<b>Urban High Residential</b>	<b>X</b>
<b>Commercial</b>	<b>X</b>
<b>Service Commercial</b>	<b>X</b>
Heavy Industrial	
General Industrial	
Parks and Schools	
<b>Public Facilities</b>	<b>X</b>
Greenway Corridor	
<b>Vegetation removal and grading</b>	<b>X</b>

### Economic Consequences

The property is proposed to include a mix of residential and commercial uses as well as a pattern of higher order streets. Fully protecting these wetlands as land develops would preclude orderly development of these areas over time. Protection of some of these wetlands until development occurs is achievable especially in the areas that will remain in the Urban Reserves. Allowing but reducing impacts is reasonable to balance development needs with the retention of natural resources.

## ENVIRONMENTAL ELEMENT

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### Social Consequences

There are opportunities for the construction of a recreational trail within MD-3 as identified in the Leisure Services Plan (2005). A trail location adjacent to the wetlands enhances the aesthetic value of the wetland and may reduce the degradation or loss of all of it. Allowing but reducing impacts is important.

### Environmental Consequences

Fully allowing impacts to these wetlands will degrade their hydrologic control function. Higher order street connections and other road improvements will affect the functions of these wetlands. Impacts could be minimized by considering realignments that avoid large portions of the wetlands and by fully analyzing the location of the street from where its extension starts to where it ends.

### Energy Consequences

A well planned street network, a mix of residential and commercial services as well as an identified trail system within this MD can have positive energy benefits on travel time and varied travel modes such as walking and biking that result in less fuel consumption.

### **Goal 5 Recommendation**

Allow but reduce impacts to the extent possible.

## **Site 7: MD-2 (Whetstone Creek – Rogue River - South of E. Vilas Road)**

This site contains six wetlands located south of E. Vilas Road. These wetlands have the following characteristics:

Wetland IDs: W10-A, W10-D, W10-E, W10-F, W10-G, W22  
OFWAM Grouping Code: MWC-5  
Watershed Boundary: Whetstone Creek – Rogue River  
Wetland Size: 11.4 acres  
Number of Parcels Affected: 5  
Combined Parcel Area: 210.81 acres  
Key Assessment Variable: Hydrologic Control  
Quality Determination: **Moderate**

### Summary of Affected Parcels

Wetland/ Tax lot	Parcel (acres)	UGB or UR	Medford GLUP Map	County Zoning/Overlay	Floodplain	Current use(s)
W10-A, W10-D, W10-E						
371W05 300	53.34	UGB	Commercial, Service Commercial, and Urban Residential	Exclusive Farm Use (EFU)	No	Structures on site, Mostly undeveloped
371W05 313	3.99	UGB	Commercial	Exclusive Farm	No	Utility

**ENVIRONMENTAL ELEMENT**

				Use (EFU)		station; South half undeveloped
W10-F						
371W05 900	76.45	UGB	Commercial and Urban Residential	Exclusive Farm Use (EFU)	No	Vacant
W10-G						
371W05 300	53.34	UGB	Commercial, Service Commercial, and Urban Residential	Exclusive Farm Use (EFU)	No	Structures on site, Mostly undeveloped
371W05 600	77.03	UGB	Commercial, Service Commercial, and Urban Residential	Exclusive Farm Use (EFU)	No	Vacant
W22						
371W05 300	53.34	UGB	Commercial, Service Commercial, and Urban Residential	Exclusive Farm Use (EFU)	No	Structures on site, Mostly undeveloped

**Distinguishing Site Characteristics**

All these wetlands were identified in a 2007 wetland delineation approved by the Department of State Lands. Wetland W10-F was a former pond that no longer exists due to decommissioning of orchard and associated irrigation.

**Conflicting Uses**

The following conflicting uses apply within this resource site and its impact area.

<b>Urban Residential</b>	<b>X</b>
Urban Medium Residential	
Urban High Residential	
<b>Commercial</b>	<b>X</b>
<b>Service Commercial</b>	<b>X</b>
Heavy Industrial	
General Industrial	
Parks and Schools	
<b>Public Facilities</b>	<b>X</b>
Greenway Corridor	
<b>Vegetation removal and grading</b>	<b>X</b>

## **ENVIRONMENTAL ELEMENT**

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### Economic Consequences

The property is proposed to include a mix of residential and commercial uses as well as a pattern of higher order streets. Fully protecting these wetlands as land develops would preclude orderly development of these areas over time. Protecting and incorporating wetlands into the commercial developments that include wetlands W10-D, W10-E, W22 are feasible as well as incorporating wetland W10-F into the residential plans. Allowing but reducing impacts to the wetlands is reasonable to balance development needs with the retention of natural resources.

### Social Consequences

Fully impacting these wetlands will degrade or eliminate their hydrologic function. Limiting conflicting uses and incorporating the wetlands into the development of these properties will preserve some of their value and allow development to occur.

### Environmental Consequences

Development in or near the wetlands may degrade the value and function of the wetlands. Limiting conflicting uses as much as possible could retain some of their function.

### Energy Consequences

Energy benefits may be seen with future road connections and proximity of different land uses together in one area potentially reducing vehicular trips and increasing walking and biking trips.

### **Goal 5 Recommendation**

Allow but reduce impacts to the extent possible.

### **Site 8: MD-2 (Whetstone Creek – Rogue River - North of E. Vilas Road)**

This site contains eight wetlands located north of E. Vilas Road. These wetlands have the following characteristics:

Wetland IDs:	W08, W09, W39-A, W39-B, W40, W41, W42, & W43
OFWAM Grouping Code:	MWC-4
Watershed Boundary:	Whetstone Creek – Rogue River
Wetland Size:	20.53 acres
Number of Parcels Affected:	3
Combined Parcel Area:	90.12 acres
Key Assessment Variable:	Wildlife Habitat, Water Quality, Hydrologic Control
Quality Determination:	<b>High</b>

## ENVIRONMENTAL ELEMENT

### Summary of Affected Parcels

Wetland/ Tax lot	Parcel (acres)	UGB or UR	Medford GLUP Map	County Zoning/Overlay	Floodplain	Current use(s)
W08 & W41						
361W32C 500	10.11	UR	N/A	Exclusive Farm Use (EFU)	Yes, Swanson Creek	Vacant
361W32C 100	40.33	UR	N/A	Exclusive Farm Use (EFU)	Yes, Swanson Creek	Structures in NW corner; remaining site undeveloped
W09 & W39-B						
361W32C 2400	39.68	UGB	General Industrial	Exclusive Farm Use (EFU)	Yes, Swanson Creek	Development on the southern portion of the property; remaining is undeveloped
361W32C 100	40.33	UR	N/A	Exclusive Farm Use (EFU)	Yes, Swanson Creek	Structures in NW corner; remaining site undeveloped
W39-A & W40						
361W32C 100	40.33	UR	N/A	Exclusive Farm Use (EFU)	Yes, Swanson Creek	Structures in NW corner; remaining site undeveloped
W42 & W43						
361W32C 500	10.11	UR	N/A	Exclusive Farm Use (EFU)	Yes, Swanson Creek	Vacant

### Distinguishing Site Characteristics

Wetlands are adjacent to or north of Swanson Creek.

## ENVIRONMENTAL ELEMENT

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### **Conflicting Uses**

The following conflicting uses apply within this resource site and its impact area.

Urban Residential	
Urban Medium Residential	
Urban High Residential	
Commercial	
Service Commercial	
Heavy Industrial	
<b>General Industrial</b>	<b>X</b>
Parks and Schools	
<b>Public Facilities</b>	<b>X</b>
Greenway Corridor	
<b>Vegetation removal and grading</b>	<b>X</b>

### Economic Consequences

Urban development is proposed on tax lot 2400 where the wetlands are located in the northeast corner of the property. Wetlands on this property can be protected fully. The majority of the wetlands in this group are located in the Urban Reserve along Swanson Creek providing an opportunity to protect these resources until future urban development is allowed. Future higher order streets are planned within the UR areas so future creek crossings and impacts to the wetlands will be seen unless alternative alignments are proposed.

### Social Consequences

Opportunities for trail connectivity along Swanson Creek is identified in the Leisure Services Plan within this MD. Impacting these wetlands will result in loss of functions as well as impacts to recreational, aesthetic, and educational benefits. Protecting these wetlands until future urban development is possible and then evaluating how to minimize impacts as development occurs will conserve the functions and values of these wetlands.

### Environmental Consequences

Fully allowing conflicting uses within these sites would degrade and potentially cause the loss of wetlands that rank high for wildlife habitat, water quality, and hydrologic control. Due to the longevity of urban development occurring, limiting conflicting uses and protecting the functions of these wetlands is achievable. Future urban impacts including higher order street connectivity are issues that will need to be addressed when construction is contemplated.

### Energy Consequences

Protecting the wetlands near Swanson Creek will have positive energy benefits for the existing wildlife and support the vegetation, temperature, and surrounding habitat along the creek.

## ENVIRONMENTAL ELEMENT

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### Goal 5 Recommendation

Allow but reduce impacts to these wetlands. Extend the riparian corridor protections along Swanson Creek and encapsulate the adjacent wetlands.

### Site 9: MD-1 (Whetstone Creek – Rogue River – North – Northwest corner)

This site contains one wetland located east of Table Rock Road. This wetland has the following characteristics:

Wetland IDs: W82  
OFWAM Grouping Code: MWC-7  
Watershed Boundary: Whetstone Creek – Rogue River  
Wetland Size: 37.15 acres  
Number of Parcels Affected: 4  
Combined Parcel Area: 77.58 acres  
Key Assessment Variable: Wildlife Habitat, Fish Habitat, Water Quality, Hydrologic Control  
Quality Determination: **High – Wetland of Special Interest for Protection**

#### Summary of Affected Parcels

Wetland/ Tax lot	Parcel (acres)	UGB or UR	Medford GLUP Map	County Zoning/Overlay	Floodplain	Current use(s)
W82						
362W36A 102	63.04	UR	N/A	Open Space Reserve (OSR) and Exclusive Farm Use (EFU)	Yes, Swanson Creek	Vacant
362W36A 103	4.81	UR	N/A	Open Space Reserve (OSR)	No	Residence
362W36A 100	4.86	UR	N/A	Open Space Reserve (OSR)	No	Vacant
362W36A 104	4.87	UR	N/A	Open Space Reserve (OSR)	No	Residence

#### Distinguishing Site Characteristics

This wetland is a vernal pool/wetland mosaic mapped from the Agate Desert Vernal Pool Planning Technical Advisory Committee in 2000. The approximate percentage of vernal pool is unknown. The feature crosses into the 100-year floodplain of Swanson Creek. There are two small water bodies present within the mapped mosaic (AW10 – a man-made pond) and WA11 (potentially natural water).

## **ENVIRONMENTAL ELEMENT**

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### **Conflicting Uses**

The following conflicting uses apply within this resource site and its impact area.

Urban Residential	
Urban Medium Residential	
Urban High Residential	
Commercial	
Service Commercial	
Heavy Industrial	
General Industrial	
Parks and Schools	
Public Facilities	
Greenway Corridor	
<b>Vegetation removal and grading</b>	<b>X</b>

### Economic Consequences

Fully protecting this wetland may be possible. The site is in the Urban Reserve and will not be impacted by urban development in the immediate future. This site has County Comprehensive Plan designations of farm and forest and zoning designations of Open Space Reserve and Exclusive Farm Use. The wetland area is not currently impacted by structures. It is unknown if the site is being farmed. Development of these properties will be processed through the County for many years so protection and/or limits on impacts will fall to them to enforce.

### Social Consequences

This wetland is rated high quality and of special interest. If conflicting uses are allowed to the maximum extent, this wetland of special interest would be lost or degraded. Protecting and/or limiting the conflicts would preserve this wetland for its educational and social values.

### Environmental Consequences

Protecting and limiting conflicting uses for this high quality wetland are possible. The County zoning designations in place help support protection of this wetland.

### Energy Consequences

There are no energy consequences of note.

### **Goal 5 Recommendation**

Protect this wetland.

**ENVIRONMENTAL ELEMENT**

**Site 10: MD-1 (Whetstone Creek – Rogue River – South – Northwest corner)**

This site contains one wetland located east of Table Rock Road and is south of wetland W82. This wetland has the following characteristics:

Wetland IDs: W25  
 OFWAM Grouping Code: WMC-8  
 Watershed Boundary: Whetstone Creek – Rogue River  
 Wetland Size: 7.71 acres  
 Number of Parcels Affected: 2  
 Combined Parcel Area: 20.2 acres  
 Key Assessment Variable: Hydrologic Control  
 Quality Determination: **Moderate – Wetland of Special Interest for Protection**

Summary of Affected Parcels

Wetland/ Tax lot	Parcel (acres)	UGB or UR	Medford GLUP Map	County Zoning/Overlay	Floodplain	Current use(s)
W25						
362W36A 600	10.2	UR	N/A	Exclusive Farm Use (EFU)	No	Structures on site
362W36A 700	10	UR	N/A	Exclusive Farm Use (EFU)	No	Structures on site; mostly vacant

**Distinguishing Site Characteristics**

This wetland is a vernal pool/wetland mosaic.

**Conflicting Uses**

The following conflicting uses apply within this resource site and its impact area.

Urban Residential	
Urban Medium Residential	
Urban High Residential	
Commercial	
Service Commercial	
Heavy Industrial	
General Industrial	
Parks and Schools	
Public Facilities	
Greenway Corridor	
<b>Vegetation removal and grading</b>	<b>X</b>

## **ENVIRONMENTAL ELEMENT**

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### Economic Consequences

Fully protecting this wetland is not expected to have significant economic consequences. Development on the site is along the wetland edges so impacts have already been limited. The property is in the Urban Reserve and will not develop with urban uses for many years.

### Social Consequences

This wetland is rated moderate but of special interest. If conflicting uses are allowed to the maximum extent, this wetland of special interest would be lost or degraded. Protecting and/or limiting the conflicts would preserve this wetland for its educational and natural values.

### Environmental Consequences

Fully allowing conflicting uses within this wetland would mean the loss of a moderate but wetland of special interest and its associated functions and values. Prohibiting or limiting conflicting uses would preserve this wetland.

### Energy Consequences

There are no energy consequences of note.

### **Goal 5 Recommendation**

Protect this wetland.

## **Site 11: MD-1 (Whetstone Creek – Rogue River – Along Swanson Creek)**

This site contains eleven wetlands located north and northwest of Justice Road. This wetland has the following characteristics:

Wetland IDs:	W06, W23, W24, W34, W35, W83, W84, W85, W86, W87, W88
OFWAM Grouping Code:	WMC-2
Watershed Boundary:	Whetstone Creek – Rogue River
Wetland Size:	11.83 acres
Number of Parcels Affected:	18
Combined Parcel Area:	135.47 acres
Key Assessment Variable:	Wildlife Habitat, Fish Habitat, Water Quality, Hydrologic Control
Quality Determination:	<b>High</b>

## ENVIRONMENTAL ELEMENT

### Summary of Affected Parcels

Wetland/ Tax lot	Parcel (acres)	UGB or UR	Medford GLUP Map	County Zoning/Overlay	Floodplain	Current use(s)
W06						
361W31A 2800	3.04	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Vacant
361W31D 1400	1.95	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Residence
361W31A 800	2.75	UR	N/A	Rural Residential land (RR-5)	Yes, Swanson Creek	Jackson County owned; Highway 62 Expressway future right-of-way
W23						
361W31B 500	4.94	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Residence
362W36A 102	63.04	UR	N/A	Open Space Reserve (OSR) and Exclusive Farm Use (EFU)	Yes, Swanson Creek	Vacant
W24						
362W36A 102	63.04	UR	N/A	Open Space Reserve (OSR) and Exclusive Farm Use (EFU)	Yes, Swanson Creek	Vacant
W34						
361W31B 2600	5.68	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Residence
W35						
361W31B 2500	5	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Residence
W83						
361W31B 2300	4.01	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Residence
W84						
361W31B	5	UR	N/A	Rural Residential	Yes,	Residence

**ENVIRONMENTAL ELEMENT**

1700				Land (RR-5)	Swanson Creek	
361W31B 2000	5.61	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Residence
361W31B 2300	4.01	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Residence
<b>W85</b>						
361W31B 1600	4.93	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Residence
361W31B 1300	4.93	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Residence
361W31B 700	4.94	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Residence
<b>W86</b>						
361W31B 1300	4.93	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Residence
361W31B 700	4.94	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Residence
361W31B 1400	4.94	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Residence
361W31B 1500	4.92	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Residence
361W31B 600	4.94	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Residence
362W36A 102	63.04	UR	N/A	Open Space Reserve (OSR) and Exclusive Farm Use (EFU)	Yes, Swanson Creek	Vacant
<b>W87</b>						
361W31D 1200	2.98	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Residence
361W31D 1300	2.4	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson	Residence

**ENVIRONMENTAL ELEMENT**

					Creek	
W88						
361W31D 1000	2.54	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Residence
361W31D 900	4.27	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Residence

**Distinguishing Site Characteristics**

These wetlands are located along Swanson Creek.

**Conflicting Uses**

The following conflicting uses apply within this resource site and its impact area.

Urban Residential	
Urban Medium Residential	
Urban High Residential	
Commercial	
Service Commercial	
Heavy Industrial	
General Industrial	
Parks and Schools	
<b>Public Facilities</b>	<b>X</b>
Greenway Corridor	
<b>Vegetation removal and grading</b>	<b>X</b>

Economic Consequences

There are two higher order streets plus the Highway 62 Expressway project proposed to impact portions of the wetlands along Swanson Creek. The Highway 62 Expressway project has been in review for several years and is proposed for construction. The Oregon Department of Transportation (ODOT) has conducted its own environmental assessments of the impacts of this project. Planning staff has also provided the Local Wetland Inventory findings to ODOT. Portions of wetlands along the Highway 62 Expressway route will be impacted. Other north-south streets identified are likely decades away from construction but impacts may occur. Fully protecting the wetlands would preclude planned road improvements. Limiting impacts to the wetlands in the locations of future roads minimizes the extent of damage to the wetlands. Extending the riparian corridor and encapsulating the wetlands that surround it along Swanson Creek will help protect the wetlands and provide a means to extend street and utility infrastructure in the future.

Social Consequences

The wetlands along Swanson Creek have been identified as high quality providing all four of the key assessment values regarding water quality and habitat benefits. Limiting conflicting uses to the wetlands to the extent possible, understanding impacts near the road crossings will occur,

## ENVIRONMENTAL ELEMENT

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provides the best scenario for maintaining segments of the wetlands and providing the road connections.

### Environmental Consequences

Allowing conflicting uses fully within the wetlands would mean the loss of high quality wetlands and their functions. Imminent impacts due to the Highway 62 Expressway project will occur to portions of the wetlands along the road corridor. Other parallel road connections are identified but would not occur for many years providing opportunities to maintain and protect those wetlands. By allowing but limiting the future street connections, the wetland functions and values could be maintained.

### Energy Consequences

Understanding there are impacts to the wetlands, the Highway 62 Expressway project could have positive energy consequences as the project is anticipated to reduce congestion and collisions along the commercial corridor of Highway 62.

### **Goal 5 Recommendation**

Allow but reduce conflicting uses related to the planned road projects. Extend the riparian corridor along Swanson Creek to incorporate the wetlands.

## **Site 12: MD-1 Northeast (Whetstone Creek – Rogue River)**

This site contains two wetlands located west of Crater Lake Highway. These wetlands have the following characteristics:

Wetland IDs: W07 & W38  
OFWAM Grouping Code: MWC-3  
Watershed Boundary: Whetstone Creek- Rogue River  
Wetland Size: 7.25 acres  
Number of Parcels Affected: 2  
Combined Parcel Area: 62.19 acres  
Key Assessment Variable: Water Quality  
Quality Determination: **Moderate**

### Summary of Affected Parcels

Wetland/ Tax lot	Parcel (acres)	UGB or UR	Medford GLUP Map	County Zoning/Overlay	Floodplain	Current use(s)
W07						
361W31A 200	55.47	UR	N/A	Exclusive Farm Use (EFU)	No	Vacant
361W31A 100	6.72	UR	N/A	Light Industrial	No	Structure on site
W38						
361W31A 200	55.47	UR	N/A	Exclusive Farm	No	Vacant

**ENVIRONMENTAL ELEMENT**

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				Use (EFU)		
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**Distinguishing Site Characteristics**

These wetlands were delineated separately in 2005 and 2012 respectively. The mapped area incorporates the DSL wetland delineation data with the City of Medford data.

**Conflicting Uses**

The following conflicting uses apply within this resource site and its impact area.

Urban Residential	
Urban Medium Residential	
Urban High Residential	
Commercial	
Service Commercial	
Heavy Industrial	
General Industrial	
Parks and Schools	
<b>Public Facilities</b>	<b>X</b>
Greenway Corridor	
<b>Vegetation removal and grading</b>	<b>X</b>
<b>County Light Industrial</b>	<b>X</b>

Economic Consequences

Fully protecting these wetlands would preclude planned street improvements such as the Highway 62 Expressway project underway, future street connections as MD-1 is urbanized, and potentially County industrial uses on tax lot 100. The western extent of W38 will be impacted by the Highway 62 Expressway project. Future street connections may impact segments of wetland W38 along its eastern extensions. Wetland W07 may also be impacted as MD-1 urbanizes due to street connections to Highway 62 and the build out of industrial uses on the site.

Interim protection of W38 (except for areas near the Expressway project) and W07 are possible by limiting conflicting uses until urbanization occurs.

Social Consequences

These wetlands are rated moderate based on their water quality values. By limiting the conflicting uses (street connections) until future urbanization occurs will help to retain their values over time. Industrial uses on tax lot 100 are still possible as the wetlands are found along the southern property line also providing an opportunity for protection.

Environmental Consequences

Fully allowing conflicting uses within the wetlands would mean the loss of a moderate quality wetland. Allowing but reducing impacts would help to conserve these wetlands to the extent possible recognizing urban development is in the distant future and development of the industrial lot can still be accomplished with little to no impacts.

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### Energy Consequences

As noted in Site 10, energy benefits are likely to be achieved with the Highway 62 Expressway project. Other street connections in the distant future are also likely to see benefits through reduced travel times and new alternate routes.

### **Goal 5 Recommendation**

Allow but reduce conflicting uses. Minimize impacts to the majority of wetlands W38 and W07 until future urbanization occurs.

### **Site 13: MD-1 Southeast (Whetstone Creek – Rogue River)**

This site contains four wetlands located south of Justice Road. These wetlands have the following characteristics:

Wetland IDs:	W04-A, W04-B, W04-Mosaic, W36
OFWAM Grouping Code:	MWC-1
Watershed Boundary:	Whetstone Creek – Rogue River
Wetland Size:	8.3 acres
Number of Parcels Affected:	3
Combined Parcel Area:	20 acres
Key Assessment Variable:	Hydrologic Control
Quality Determination:	<b>Moderate except W04-Mosaic is noted as a wetland of special interest for protection (rare/unique)</b>

### Summary of Affected Parcels

Wetland/ Tax lot	Parcel (acres)	UGB or UR	Medford GLUP Map	County Zoning/Overlay	Floodplain	Current use(s)
W04-A						
361W31D 1700	5	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Structures on site
361W31D 1800	5.01	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Vacant
W04-B						
361W31D 1900	9.99	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Vacant
W04-Mosaic						
361W31D 1800	5.01	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Vacant
361W31D 1900	9.99	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson	Vacant

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					Creek	
W36						
361W31D 1800	5.01	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Vacant
361W31D 1700	5	UR	N/A	Rural Residential Land (RR-5)	Yes, Swanson Creek	Structures on site

**Distinguishing Site Characteristics**

Wetland W04-A connects to Wetland W04-B by a ditch line, and is likely connected hydrologically to W04-mosaic. Wetland W04-B is depressional and fed by ditch inflow and distinct from the mosaic complex. Wetland W04-mosaic appears to be a vernal pool/wetland mosaic. The northeast corner of the feature has been graded and has a selection of flowering vernal pool herbs.

**Conflicting Uses**

The following conflicting uses apply within this resource site and its impact area.

Urban Residential	
Urban Medium Residential	
Urban High Residential	
Commercial	
Service Commercial	
Heavy Industrial	
General Industrial	
Parks and Schools	
<b>Public Facilities</b>	<b>X</b>
Greenway Corridor	
<b>Vegetation removal and grading</b>	<b>X</b>

Economic Consequences

Fully protecting these wetlands may preclude an identified higher order street proposed to connect Justice Road to E. Vilas Road through MD-1 in the future. Review of alternative routes that minimize the impact to the rare wetland need to be considered. Future urban uses may result in industrial zoning further impacting the wetlands. Allowing but reducing the impacts to these wetlands to the extent possible will help ensure future street connectivity and urban uses.

Social Consequences

The wetlands are rated as moderate and one is rated as rare of special interest. The Leisure Services Plan (2005) identifies a trail network bisecting the properties providing recreational and educational opportunities. A future, higher order north-south street is proposed to cross the rare wetland. By considering alternate routes, the rare wetland could see reduced impacts that will help preserve a larger portion of it into the future.

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### Environmental Consequences

Fully allowing the conflicting uses would impact a rare wetland of special interest identified on the properties and degrade or lose its significance. Future urban industrial uses on the properties also will cause impacts that would result in loss of the wetlands. Shifting the future street connection around the perimeter of the rare wetland could protect it. This action however may result in additional impacts to Wetlands W04-A and W-04B just west of the rare wetland (W04-mosaic). Interim protection of these wetlands until urban development occurs is possible.

### Energy Consequences

There are no energy consequences of note.

### **Goal 5 Recommendation**

Allow but reduce impacts to the wetlands. Identify alternate routes for street connection to avoid the rare wetland and limit its impact.

## Summary of Analysis

Site	MD Location	Wetland IDs	Quality Determination	Goal 5 Recommendation
1	MD-6	W19-A W19-B	Moderate	Allow but reduce impacts
2	MD-5	W18 W79	High	Protect; Extend Riparian Corridor
3	MD-5	W70 W71 W72 W74	High	Allow but reduce impacts
4	MD-5	W13 W66	Moderate	Allow but reduce impacts
5	MD-5	W14 W15 W63 (not significant)	Moderate	Allow but reduce impacts; Extend riparian corridor
6	MD-3	W11 W21 W46 W47 W48 W49 W50 W51 W53	Moderate	Allow but reduce impacts

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		W54 W55 W56		
7	MD-2	W10-A W10-D W10-E W10-F W10-G W22	Moderate	Allow but reduce impacts
8	MD-2	W08 W09 W39-A W39-B W40 W41 W42 W43	High	Allow but reduce impacts; Extend riparian corridor
9	MD-1	W82	High- Wetland of Special Interest	Protect
10	MD-1	W25	High – Wetland of Special Interest	Protect
11	MD-1	W06 W23 W24 W34 W35 W83 W84 W85 W86 W87 W88	High	Allow but reduce impacts, Extend riparian corridor
12	MD-1	W07 W38	Moderate	Allow but reduce impacts
13	MD-1	W04-A W04-B W04-mosaic W36	High; W04-Mosaic (Wetland of Special Interest)	Allow but reduce impacts; Minimize impacts to the wetland mosaic