COMMUNITY DEVELOPMENT

MEMORANDUM

TO: Deschutes County Planning Commission

FROM: Nick Lelack, AICP, Director
Peter Gutowsky, AICP, Planning Manager

DATE: December 3, 2020

SUBJECT: Deschutes 2040 / Orientation to Statewide Planning Goals 6 and 7

I. Background

The Community Development Department (CDD) anticipates initiating a Deschutes County Comprehensive Plan Update (Deschutes 2040) in Fall 2021. Staff prepared a seven-month, 12-part orientation for the Planning Commission to familiarize itself with the Statewide Planning Goals and their relationship to noteworthy state statutes (ORSs), administrative rules (OARs), Comprehensive Plan Sections, implementing codes, and issues emerging since 2010. More information is available at www.deschutes.org/Plan2040. Table 1 lists the Planning Commission work session dates for the Statewide Planning Goals. This is part 6 of 12 of the orientation series.

Table 1 – Planning Commission Work Session Dates & Discussion Topics

Dates	***Statewide Planning Goals***
September 10	**Oregon Land Use Program Overview**
September 24	**Goal 1** - Citizen Involvement **Goal 2** - Land Use Planning
October 8	**Goal 3** - Agricultural Lands **Goal 4** - Forest Lands
October 22	**Goal 5** - Natural Resources, Scenic and Historic Areas, and Open Spaces (PART I - Water Resources, Wildlife)
November 12	**Goal 5** - Natural Resources, Scenic and Historic Areas, and Open Spaces (PART 2 - Scenic and Open Spaces and Historic Resources) **Goal 5** - Natural Resources, Scenic and Historic Areas, and Open Spaces (PART 3 - Mineral and Aggregate Resources)
December 10	**Goal 6** - Air, Water, and Land Resources Quality **Goal 7** - Areas Subject to Natural Hazards
January 14	**Goal 8** - Recreational Needs
January 28	**Goal 9** - Economic Development

February 11	**Goal 10** - Housing **Goal 11** - Public Facilities and Services
February 25	**Goal 12** - Transportation
March 11	**Goal 13** - Energy Conservation **Goal 14** - Urbanization
March 25	**Recap / Annual Work Plan Work Session** - Discussion

II. Statewide Planning Goal 6

Goal 6 – Air, Water, and Land Resources Quality

Goal 6 instructs local governments to consider protection of air, water and land resources from pollution and pollutants when developing comprehensive plans. The pollutants addressed in Goal 6 include solid waste, wastewater, noise and thermal pollution, air pollution, and industry-related contaminants. The goal asks cities and counties to designate areas suitable for use in controlling pollution. It calls on them to use a variety of market, zoning, and management tools in creating these outcomes.

At a federal level, the elements within Goal 6 correspond broadly to the Clean Air Act and Clean Water Act. At a state level, Goal 6 covers many areas regulated by the Oregon Department of Environmental Quality (DEQ) through its permitting actions. DEQ ensures its permitting decisions comply with the plan and zoning regulations of the affected local government and coordinates with DLCD and other agencies to be sure that city and county plans comply with state and federal laws.

No Oregon Administrative Rules (OARs) implement Goal 6.

III. Deschutes County Comprehensive Plan

Section 2.9 – Environmental Quality

Section 2.9 discusses Deschutes County's role in addressing state or federal environmental regulations regarding waste and process discharges from the combined effect of new and existing development. Title 18, Deschutes County Zoning does not have specific regulations addressing environmental quality. The County Environmental Soils Division oversees the Onsite Wastewater Management Program on behalf of the Oregon Department of Environmental Quality (DEQ) for all onsite wastewater treatment systems (also known as septic systems) within Deschutes County boundaries.

Clean Air

Deschutes County air is monitored by DEQ and is generally recognized for having healthy air quality levels. Two of the primary air quality issues are pollution from automobiles and wildfires. Deschutes County is somewhat limited in addressing automobile pollution since rural homes are spread out over long distances, making alternatives to the automobile such as bicycles or transit challenging, not to mention rural residents' overwhelming preference to drive and the region's winter challenge to biking or walking.. Deschutes County as a partnering agency supports Cascade East Transit (CET). CET, which is managed by

Central Oregon Intergovernmental Council (COIC). CET offers fixed-routes within Bend and city connectors throughout Central Oregon. In 2020, CET extended service between La Pine and Sunriver.

Clean Water

Water issues are addressed in Section 2.5, Water Resources and Section 3.10, Newberry Country Plan. Excerpts are provided below.

Groundwater Quality

Groundwater in Deschutes County provides high-quality drinking water to most of its residents. However, several productive aquifers lie in shallow alluvial sediments that are vulnerable to contamination from human activities and development. The La Pine aquifer in the southern portion of the county from the Sunriver area to the Klamath County line and between the Newberry Caldera and the Cascades is an area of particular concern. The concern is based on data collected through U.S. Geological Survey (USGS) and DEQ studies and the concentration of development in the area.

In South Deschutes County, the concern for groundwater quality arises from nitrate contamination associated with on-site wastewater treatment (septic) systems discharging into the shallow unconfined aquifer. The issue is small lots with highly permeable, rapidly draining soils and a high groundwater table with relatively cold water temperatures. Combined with the fact that the majority of lots are served by on-site wastewater treatment systems and individual wells, concern arose that nitrates from the septic systems could contaminate local wells and the river system.

Surface Water Quality

The federal Clean Water Act (CWA) requires identifying rivers that do not meet water quality standards for several parameters. The DEQ periodically evaluates water bodies in Oregon based on federally approved water-quality standards. A list of water-quality impaired water bodies is produced from this analysis and referred to by the section of the CWA, as 303(d) listings. The list is the basis for developing state standards for each pollutant entering a water body. These Total Maximum Daily Loads (TMDL) are used with Water Quality Management Plans to outline how agencies and individuals will meet water quality standards for those listed water bodies.

The TMDL Water Quality Management Plans identify Designated Management Agencies (DMA) required to develop and implement them. A DMA can be a federal, state, or local governmental agency that has legal authority to address the contributing pollutants. A TMDL implementation plan must indicate how the DMA will reduce pollution in order to address load allocations. The following are identified on the federal Clean Water Act 303(d) List for 2006 for not meeting water-quality standards. This list is regularly amended by DEQ so specific segments are not listed.

Rivers

- Upper Deschutes River
- Middle Deschutes River
- Little Deschutes River

Lakes

- Lava Lake

Tributaries

- Indian Ford Creek
- Tumalo Creek
- Whychus Creek

Clean Land

Noxious weeds are a serious issue in Deschutes County. These non-native and sometimes poisonous species overrun native vegetation, shelter undesirable insects, consume scarce water, and infest crops. The County has a Weed District as defined by Oregon Revised Statute (ORS) 570.500-600, with a Board that oversees education and active weed eradication. Enforcement procedures have been initiated that include citations and fines.

In 1994 Deschutes County adopted an outdoor lighting ordinance to allow residents to light their properties as needed, but to ensure the lighting does not illuminate outside the owner's property. This ordinance will be revisited this fiscal year to ensure adequate protection of the nighttime sky.

Environmental Quality Goals and Policies recognize among others:

- Where research identifies environmentally sensitive areas, work with agencies and stakeholders to protect those areas or minimize adverse land use or development impacts.
- Support education for the community and for County departments on how to recognize and report on noxious weeds.
- Maintain County noise and outdoor lighting codes and revise as needed.

Since the Comprehensive Plan was last updated in 2010, two issues have emerged in relation to environmental quality:

- New Landfill. Knott Landfill is expected to be full by 2029. Last year, the Board of County Commissioners (Board) adopted a waste management plan that recommends the county build its own landfill instead of trucking trash elsewhere.

- Terrebonne Sewer Feasibility Study. Initiated by a Terrebonne resident who petitioned and gathered 100 signatures from individuals in the community who were interested in seeing an updated wastewater feasibility study for Terrebonne, Deschutes County Road Department agreed to fund the feasibility study.[1] However, Deschutes County has no intention to operate and maintain a sewer system in Terrebonne.

IV. Statewide Planning Goal 7

Goal 7 – Natural Hazards

Goal 7 requires local comprehensive plans to address Oregon's natural hazards. The purpose of this goal is to protect people and property from natural disasters and hazards, such as floods, landslides, earthquakes, tsunamis, coastal erosion and wildfires. As components of their comprehensive plans, local governments are required to include inventories, policies and implementing measures to reduce risks to people and property due to natural hazards and disasters.

No Oregon Administrative Rules (OARs) implement Goal 7.

[1] https://www.deschutes.org/road/page/terrebonne-wastewater-feasibility-study

V. Deschutes County Comprehensive Plan

Section 3.5 – Natural Hazards

Section 3.5 discusses Deschutes County's Hazard Mitigation Plans. In 2004 the County created a Forestry Specialist position to coordinate forest issues, including addressing fire prevention. The 2006 Deschutes County Natural Hazard Mitigation Plan (NHMP) was written collaboratively and adopted by the Board of County Commissioners as the official assessment of potential natural hazards. It was the first pre-disaster plan approved by the Federal Emergency Management Agency in Oregon. There are five natural hazards identified in the NHMP for Deschutes County: wildfire, severe winter storms, flooding, earthquakes, and volcanic eruption.

Wildfire and severe winter storms are the natural hazards most probable and therefore the highest priority in Deschutes County. The third priority is flooding. Generally, river flooding along the Deschutes River has not historically been a serious problem in Deschutes County due to the porous nature of the geology, irrigation diversion canals, and reservoir retention. Studies completed by the U.S. Army Corp of Engineers (ACOE) have resulted in designating a 100-year flood plain for the Little Deschutes River and Whychus Creek. Regular flooding events have occurred near the headwaters of Tumalo Creek and in the Tumalo community. Along Whychus Creek, the City of Sisters frequently experiences flooding, with the most significant event occurring in 1964. A second area of concern focuses on the potential of flooding related to the failure of glacial moraine dams that impound high-altitude lakes around the Three Sisters and Broken Top.

Earthquakes and volcanic eruption are the last two and have a low probability of occurrence. The complex geology of Deschutes County, with geologically recent eruptions, increases the potential for these types of natural disasters. Two long-lived volcanic centers, Three Sisters to the west and Newberry Caldera to the south, and many tens of smaller volcanoes have hosted numerous eruptions in geologically recent times that range widely in size and character. No eruptions have occurred in Deschutes County during the past 1,000 years, however the millennium before experienced numerous eruptions, including several at South Sister, many eruptions in the McKenzie Pass and Belknap Crater areas, and one eruption at Newberry Volcano. Earthquakes are possible from four sources, though expert opinions vary regarding the degree of susceptibility from each. The four sources are:

- Off-shore Cascadia Fault Zone,
- Deep intraplate events within the subducting Juan de Fuca Plate,
- Shallow crustal events within the North American Plate, and
- Earthquakes associated with renewed volcanic activity.

All have some tie to the subducting (diving) of the dense, oceanic Juan de Fuca Plate under the lighter, continental North American Plate. Volcanic earthquakes are commonly smaller than about magnitude 2.5, roughly the threshold for shaking felt by observers close to the event.

Deschutes County regulates natural hazards through Deschutes County Code (DCC) Chapters 18.36, Forest Use 1; 18.40, Forest Use 2; 18.96, Flood Plain Zone; and 18.128, Conditional Use. The two forest use zones contain development standards for dwellings addressing road access, water supply, and fire siting. DCC

Chapter 18.128 contains general compatibility criteria that have been applied to cluster developments to require dedicated open space to be managed for both wildlife and defensible space in perpetuity.

Natural Hazard Goals and Policies recognize among others:

- Adopt by reference the most recent Deschutes County Natural Hazards Mitigation Plan into this Plan.
- Provide incentives and if needed regulations, to manage development in areas prone to natural hazards.
- Regulate development in designated floodplains identified on the Deschutes County Zoning Map based on Federal Emergency Management Act regulations.

Since the Comprehensive Plan was last updated in 2010, two issues have emerged in relation to natural hazards:

- 2015 Natural Hazards Mitigation Plan. The NHMP is typically updated every five to ten years. The 2010 version is referenced in the Comprehensive Plan. The current version is 2015.[2] The Deschutes 2040 process will need to revisit the NHMP and Section 3.5 to determine if the existing conditions, goals, and policies are still adequate.

- Wildfire Mitigation Measures. Deschutes County is considering changes to help reduce the risk of wildfire. Changes to building codes and land use regulations are being considered to better protect our communities from wildfire. The potential regulations would only apply in the rural county outside of city limits. The two measures the county is considering include the use of fire-resistant building materials for new rural residential construction and requiring Defensible Space for all rural properties.[3]

VI. Invited Guests

- Will Groves, Deschutes County Senior Planner and Flood Plain Manager, will participate in the work session. He will discuss the Flood Plain Zone.

Attachments:

Comprehensive Plan
Section 2.9
Section 3.5

[2] https://sheriff.deschutes.org/2015_Deschutes_MNHMP.pdf
[3] https://www.deschutes.org/cd/page/wildfire-mitigation

Section 2.9 Environmental Quality

Background

Environmental quality is addressed in Statewide Planning Goal 6, Air, Water and Land Resources Quality, which requires local governments to comply with applicable state or federal environmental regulations regarding waste and process discharges from the combined effect of new and existing development. The Oregon Department of Environmental Quality (DEQ) is the regulatory state agency primarily responsible for monitoring and enforcing both federal and state environmental regulations. They issue and enforce permits for pollution control and monitor air, water and land quality.

Still, a DEQ fact sheet (DEQ 06-OD-001 1/09) shows that more than 80% of land, air and water pollution comes from the daily activities of Oregonians, such as driving cars and fertilizing lawns. Because the majority of pollution comes from everyday actions, there is much that can be done locally. There is a growing awareness that seemingly small individual actions, such as employing reusable grocery bags or dumping used motor oil down the drain, can cumulatively impact the environment, either positively or negatively.

The concept of sustainable development that meets the needs of today without compromising the needs of future generations, provides a context for thinking about future growth. It is a common sense way to be sure that the consequences of collective actions are understood.

Two primary methods for the County to promote careful stewardship of the environment are by setting a good example through County actions and by providing information to the community on a variety of environmental issues. Additionally the County can thoughtfully manage the impacts of growth on the environment in cooperation with other agencies, organizations and jurisdictions.

Clean Air

Deschutes County air is monitored by the DEQ and is generally good quality. One of the primary air quality issues nationally and locally, is the pollution from automobiles. Deschutes County is somewhat limited in addressing this issue since rural homes are spread out over long distances, making alternatives to the automobile such as bicycles or transit challenging. One way to address this is to cooperate with cities in promoting smart growth in urban areas. Smart growth uses thoughtful design to build compact neighborhoods with a variety of transportation alternatives such as transit or trails.

Forest fires are the other primary sources of air pollution in this area. The County is actively working to prevent and control forest fires, but this issue is multi-jurisdictional and involves cooperation and education (see Section 3.5).

Another air quality issue that has been raised is the potential problems that come from allowing new residential uses to locate near existing mining or industrial uses. One way to deal with this issue is to consult DEQ on these approvals so they can make recommendations for siting the residential use based on prevailing winds.

Clean Water

Water quality issues cannot be separated from the issues of water availability and the health of rivers and streams. Concerns over water quantity and quality were noted frequently in public meetings as a key issue for the County going forward. Water issues are addressed in this Plan in Section 2.5 Water Resources and Section 3.10 under South Deschutes County's Regional Problem Solving.

Clean Land

Land provides essential food, shelter, raw materials and plant and animal habitat. Maintaining healthy and productive land is key to every section of this Plan. Yet, land quality is generally discussed in relationship to specific developed sites with possible pollution, such as gas stations, land fills or dry cleaners. DEQ maintains a list of potentially polluted sites in Deschutes County and works with property owners to enforce state and federal regulations.

Any development has an impact on the land and many of those impacts can be controlled though understanding, education and if needed, regulation. The following issues have been raised:

Noxious Weeds

Noxious weeds are a serious issue in Deschutes County. These non-native and sometimes poisonous species overrun native vegetation, shelter undesirable insects, consume scarce water and infest crops. They can and do grow anywhere, but thrive on disturbed surfaces. Roadsides, former farmlands, inactive surface mines and non-landscaped areas around construction sites are all prime sites. Weeds on any one property have a major affect on the maintenance of others.

The County has a Weed District as defined by Oregon Revised Statute (ORS) 570.500-600, with a Board that oversees education and active weed eradication. Enforcement procedures have been initiated that include citations and fines. A review of opportunities to regulate weeds through the Zoning Code should be explored. These regulations should require not just eradication but also restoration, to prevent further infestations.

Sustainable Green Building

Both during construction and over time, buildings impact the environment. Green building focuses on design, construction and operation of buildings that efficiently use energy, water and materials, while promoting a clean environment. Environmentally friendly development can be extended to include utility facilities/lines and roads. There are industry accepted standards that have been developed for creating low impact and efficient buildings, such as those of Leadership in Energy and Environmental Design (LEED).

Additionally innovative, environmentally-friendly building techniques, like straw bale construction are regularly being proposed. The County can review the State building code to promote flexibility and safety in reviewing design innovations. Another step is to continue to advocate green building by providing information to the public.

Noise and Light Pollution

Noise is often defined as unwanted sound. It can vary in frequency, duration and intensity. In Deschutes County noise is regulated in the Health and Safety section of County Code.

However, often noise issues arise out of specific land uses. As a rural county, some noise from farming and forestry practices is normal and permitted. Still, in 2010 attempts to increase the types of uses allowed on rural residential and farm lands have raised the question of how much noise is appropriate. Noise travels long distances in rural areas and can impact the quality of life for rural residents. The County will continue to address noise concerns as specific land uses are proposed and regularly evaluate the current noise restrictions.

In Deschutes County night skies are expansive and in the rural darkness the stars and Milky Way are brightly visible. The University of Oregon maintains the Pine Mountain Observatory to take advantage of these conditions. In 1994 Deschutes County adopted an outdoor lighting ordinance to allow residents to light their properties as needed, but to ensure the lighting does not illuminate outside the owners property. This ordinance needs to be retained and reviewed regularly to ensure adequate protection of the nighttime darkness.

Solid Waste / Recycling / Hazardous Waste

Oregon law establishes a hierarchy for managing solid waste with a goal of minimizing waste disposal. The first step is to prevent waste generation, followed by reuse, recycling, composting and energy recovery. Only if those options are not available does disposal come into play. Although recycling programs frequently have an economic cost, they provide environmental benefits though conserving energy and landfill space. The key to successful recycling is the availability of markets for recycled goods.

Deschutes County's Solid Waste Department, in response to State Statute and community demand, continues to refine existing recycling programs and explore new programs and opportunities. As of 2010 programs include education, curbside recycling and free and convenient drop off sites. Also available, although more limited, is free disposal of hazardous waste and electronic waste. One aspect of recycling that could be strengthened is recycling of construction waste. Deschutes County's task is to continue to manage waste in a manner that is fiscally responsible, environmentally thoughtful and in compliance with state and federal regulations.

Area of Critical State Concern

The Oregon legislature first authorized the designation of an Area of Critical State Concern (ACSC) as part of the legislation creating the statewide land use program (Senate Bill 100) in 1973. At that time, several areas were identified as possibly warranting state protection in the face of uncontrolled development, including the Columbia River Gorge, areas of the Oregon Coast, and portions of the Metolius basin. Several of these areas were later protected through federal action, or through special state land use goals.

On July 15, 2009 the Legislative Assembly enacted HB 3298. House Bill 3298, designates the Metolius basin and an adjoining area as the Metolius Area of Critical State Concern (Metolius ACSC) and approves an accompanying management plan submitted by the Land Conservation and Development Commission (LCDC). The legislature approved the management plan and directed the LCDC to adopt the plan, by rule, with specified changes.

HB 3298 approves the designation of the Metolius Area of Critical State Concern as recommended by LCDC. This area includes the Metolius drainage basin and an adjoining area (Areas 1 and 2 in the management plan), which are located in portions of Jefferson and Deschutes Counties (near Black Butte). The prohibition of new destination resorts applies to

eligible lands mapped previously by Jefferson and Deschutes Counties in the Metolius Area of Critical State Concern.

The following uses are prohibited in the Metolius Area of Critical State Concern management plan approved under HB 3298:

- Any new destination resort, as defined by Statewide Planning Goal 8 or ORS 197.435 to 197.467.
- Any new golf course.
- Certain new residential, commercial, industrial or new uses exceeding a stated number of dwelling units, or exceeding an average annual consumptive use of water, depending whether the land is in Area 1 or Area 2.

Section 2.9 Environmental Quality Policies

Goals and Policies

Goal 1 **Maintain and improve the quality of the air, water and land.**

Policy 2.9.1 Support environmental stewardship in County operations and capital projects, including where feasible, using resource-efficient building techniques, materials and technologies in County building projects.

Policy 2.9.2 Maintain County noise and outdoor lighting codes and revise as needed.

Policy 2.9.3 Where research identifies environmentally sensitive areas, work with agencies and stakeholders to protect those areas or minimize adverse land use or development impacts.

Policy 2.9.4 Be a leader in the control of noxious weeds and invasive species through education and regulations.

a. Support education for the community and for County departments on how to recognize and report on noxious weeds.

Goal 2 **Promote sustainable building practices that minimize the impacts on the natural environment.**

Policy 2.9.5 Review County Code and revise as needed to promote the use of resource-efficient building and landscaping techniques, materials and technologies for new construction and renovation projects.

Goal 3 **Encourage and increase recycling.**

Policy 2.9.6 Encourage and support reuse through education and recycling through the Recycling Program.

a. Provide convenient recycling at all County events and in all County facilities.
b. Provide convenient opportunities to recycle materials and compost green waste in locations at transfer stations and through home pick up.
c. Provide convenient opportunities for disposal of hazardous waste and e-waste.
d. Aim for 80% recycling of construction waste in all County building projects.
e. Promote 20% recycling of construction waste in all projects requiring a building permit.
f. Support businesses and industries that utilize recyclable materials.

Section 3.5 Natural Hazards

Background

The need to address natural hazards has been elevated due to the population growth in the region. The majority of Deschutes County lies within a large basin. While this location makes the county less vulnerable to certain natural disasters such as landslides and windstorms, it does not protect the area from wildland fires, severe winter storms and the low probability of earthquakes and volcano eruption. Recently, Deschutes County has experienced a high number of wildland fires. These fires have impacted environmental health and economic well-being as well as the safety of people and structures.

Natural hazards are addressed in Statewide Planning Goal 7, Areas Subject to Natural Hazards. Goal 7 lists potential natural hazards, such as wildfire or floods, and directs communities to enact comprehensive plan policies and implementing regulations to reduce the risk to people and property. Local governments are directed to respond to new information provided by federal or state agencies in cooperation with other local governments and in a defined timeframe.

Informed by an understanding of natural hazards, Deschutes County can reduce the risks to property, environmental quality, and human safety by planning for land use patterns and site-specific development. The policies in this section of the Plan provide the framework for evaluating land use actions for their exposure to potential harm from natural hazards. The policies guide the identification of areas subject to natural hazards, regulation and protection of citizens, property and the environment. The protection methods prescribed by these policies include prevention and preparedness, land use regulation, use of natural systems to mitigate hazards, public education, and collaboration with other organizations.

Deschutes County Hazard Mitigation Plans

The County maintains plans for natural hazards. In 2004 the County created a Forestry Specialist position to coordinate forest issues, including addressing fire prevention. The 2006 Deschutes County Natural Hazard Mitigation Plan was written collaboratively and adopted by the Deschutes Board of County Commissioners as the official assessment of potential natural hazards. It was the first pre-disaster plan, approved by the Federal Emergency Management Agency in Oregon.

Both the 2006 Natural Hazard Mitigation Plan and its update in 2010 were prepared in close collaboration with partners such as the U.S. Forest Service, Oregon Department of Forestry, local fire districts and municipalities. As Table 3.4.1 indicates, wildfire and severe winter storms are the natural hazards most likely to occur in Deschutes County. Each identified natural hazard is discussed below.

Table 3.5.1 - Natural Hazard Identification for Deschutes County

Hazard	*Probability of Occurrence*	*Vulnerability Assessment*	*Priority*
Wildland Fire	High	High	**1**
Severe Winter Storms	Moderate	High	**2**
Flooding	Moderate	Moderate	**3**
Volcanic Eruption	Low	Low	**4**
Earthquake	Low	Low	**4**

Source: 2010 Deschutes County Natural Hazard Mitigation Plan

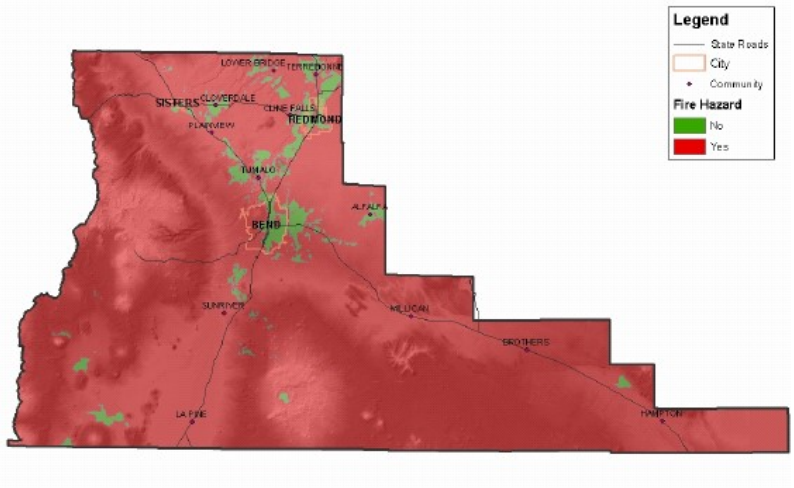
Wildfire

Wildland fire is historically a natural and necessary component of forest ecosystems. About 100 years ago these fires were halted to promote livestock grazing, logging and other activities. Forests and other wildlands are now significantly altered due to fire prevention and suppression efforts, resulting in overgrown forests with closed canopies and decaying fuels that burn more intensely than in the past.

In addition, the recent increase in population has led to increased development in the Wildland Urban Interface (WUI), the area where residential and commercial development is intermixed with forested lands. The demand for housing has pushed areas of high density residential development further into sites traditionally covered by wildland vegetation. Between fire controls and population growth, Deschutes County experienced a significant number of large, fast-moving destructive wildland-urban interface wildfires in the last quarter century.

Current land managers are working to restore the open ponderosa pine habitat and its resiliency to fire. Thinning stands to reduce the overall density makes it possible to reintroduce low-severity prescribed fire. These controlled surface fires open the forest floor and recycle nutrients, renewing the native diversity of grasses, shrubs and wildflowers. Additionally, a network of federal, state and local efforts are being directed to preventing wildfires.

Deschutes County Fire Hazard Zones



Federal Healthy Forests Restoration Act

The Healthy Forests Restoration Act directs federal agencies to collaborate with communities in developing a Community Wildfire Protection Plan (CWPP), which includes the identification and prioritization of areas needing hazardous fuels treatment. It further provides authority to expedite the National Environmental Policy Act process for fuels reduction projects on federal lands. The act also requires that 50% of funding allocated to fuels projects be used in the Wildland Urban Interface. For the first time communities have the opportunity to direct where federal agencies place their fuels reduction efforts. With a CWPP in place, community groups can apply for grants to treat hazardous fuels and address special concerns to reduce the risk of catastrophic loss as a result of wildland fire.

The Healthy Forests Restoration Act requires that the applicable local government, fire departments and state entities responsible for forest management agree to the Community Wildfire Protection Plans. These Plans outline the priorities, strategies and actions for fuels reduction treatments in a specific planning area. Additionally, CWPPs also address special areas of concern and make recommendations for reducing structural vulnerability and creating defensible spaces in sub-regions within the planning area. They are intended to be a living vehicle for fuels reduction, education, and other projects to decrease overall risks of loss from wildland fire. As of 2010 there are seven adopted CWPPs that cover all the land in Deschutes County.

Deschutes County Community Wildfire Protection Plans

- Greater Bend
- Greater La Pine
- Greater Redmond
- Greater Sisters
- Sunriver
- Upper Deschutes River Coalition
- Walker Range

Oregon Forestland-Urban Interface Fire Protection Act

The Oregon Forestland-Urban Interface Fire Protection Act, often referred to as Senate Bill 360, enlists the aid of property owners toward turning fire-vulnerable urban and suburban properties into less-volatile zones where firefighters may more safely and effectively defend homes from wildfires. Basically, the law requires property owners in identified forestland-urban interface areas to reduce excess vegetation which may fuel a fire, around structures and along driveways. In some cases, it is also necessary to create fuel breaks along property lines and roadsides.

Forestland-urban interface areas are identified in each county by a classification committee. A committee is composed of five members -- three appointed by the county, one by the state fire marshal and one by the state forester. The process of identifying forestland-urban interface areas is described in Oregon Administrative Rules 629-044-1005 through 629-044-0145 and includes:

- Lands within the county and also inside an Oregon Department of Forestry protection district.
- Lands that meet the state's definition of "forestland."

- Lands that meet the definition of "suburban" or "urban"; in some cases, "rural" lands may be included within a forestland-urban interface area for the purpose of maintaining meaningful, contiguous boundaries.
- Lots that are developed, that are 10 acres in size or smaller, and which are grouped with other lots with similar characteristics in a minimum density of four structures per 40 acres.

Once forestland-urban interface areas are identified, a committee applies fire-risk classifications. The classifications range from "low" to "extreme," and are used by a property owner to determine the size of a fuel break that needs to be established around a structure. Oregon Department of Forestry supplies information about the acts' fuel-reduction standards and mails each property owner a certification card, which may be signed and returned to that agency after the fuel-reduction standards have been met.

Deschutes County is one of two counties in Oregon that has fully implemented the Act. Senate Bill 360 requirements have been applied county-wide. Residents can maintain their defensible space through incentive programs such as the spring and fall Fire Free Clean Up days. Local fire departments and the Fire Prevention Co-op provide education. Monitoring is conducted by visits to the area and ongoing educational campaigns for homeowners.

Firewise Communities

The national Firewise Communities program is a multi-agency effort designed to involve homeowners, community leaders, planners, developers, and others in the effort to protect people, property, and natural resources from the risk of wildland fire - before a fire starts. The Firewise Communities approach emphasizes community responsibility for planning in the design of a safe community as well as effective emergency response, and individual responsibility for safer home construction and design, landscaping, and maintenance. The Central Oregon District has eight Firewise Communities USA neighborhoods nationally recognized in the state of Oregon: Fall River in 2004, Caldera Springs and Wildriver in 2007, Cascade Meadows, Aspen Lakes, Awbrey Glen and River Meadow in 2009 and Crosswater in 2010. Working closely with communities is key in achieving defensible space.

Project Wildfire

Project Wildfire is the result of a Deschutes County collaborative effort to create long-term wildfire mitigation strategies and provide for a disaster-resistant community. Created through Deschutes County Code 8.24.010 and governed by a Steering Committee appointed by the Board of County Commissioners, Project Wildfire coordinates and implements strategies to mitigate the effects of losses due to natural disasters. This group reaches out to the community with FireFree, a fire education program. They also facilitate Community Wildfire Protection Plans. Finally Project Wildfire coordinates the implementation of fuel reduction programs and renewable uses for the materials that are removed.

Project Wildfire Duties

- To reduce potential loss of life and property through natural and human disasters by enhancing public awareness, expanding community partnerships and prioritizing potential hazard mitigation projects, using stakeholder and citizen input.
- Advise the Board of County Commissioners, Project Wildfire staff and the Deschutes County Office of Emergency Management and other agencies and programs on adoption

and implementation of wildfire mitigation and other natural hazard projects, including but not limited to Hazard Mitigation programs approved by the Federal Emergency Management Agency.

Project Wildfire Advisory Responsibilities

- To make suggestions to stakeholders concerning disaster response plans, needed changes in state or local laws and provide assistance to implement such suggestions.
- To make recommendations on disaster planning as appropriate or as requested by the Board of County Commissioners or other stakeholders.

Partnerships

Project Wildfire builds partnerships, sharing resources and eliminating redundancies that allow the community to succeed where other solo organizations or individuals cannot.

Table 3.5.2 - Project Wildfire Partner Organizations

▪ Deschutes County	▪ Oregon Office of State Fire Marshal
▪ Deschutes County Rural Fire Protection District No. 2	▪ Deschutes National Forest - USFS Redmond Fire and Rescue
▪ Oregon Department of Forestry	▪ Jefferson County Fire District
▪ Bureau of Land Management	▪ La Pine Rural Fire Protection District
▪ Central Oregon Fire Prevention Cooperative	▪ Sunriver Fire Department
▪ Keep Oregon Green	▪ Sisters-Camp Sherman Fire District
▪ Bend Chamber of Commerce	▪ Southeast Bend Neighborhood Association
▪ Bend Radio Group	▪ Deschutes River Woods HOA
▪ Combined Communications	▪ Awbrey Butte Neighborhood Association
▪ Horizon Broadcasting	▪ City of Bend Fire Department
▪ Every Idea	▪ Ponderosa Pines HOA
▪ Redmond Chamber of Commerce	▪ Sunriver
▪ Awbrey Glen HOA	▪ Tillicum Village HOA
▪ Woodside Ranch HOA	

2005-2010 Accomplishments

Project Wildfire has had many accomplishments, such as those listed below.

- Successfully competed for approximately $8.3 million from a variety of grant funds
- Successfully treated over 2,000 acres of private and county owned lands utilizing National Fire Plan Fuels Treatment grants
- Treated 63,805 acres of private lands for wildland fuels treatment
- Implemented a Low Income Fuels Treatment Assistance program
- Collected 238,562 cubic yards of FireFree woody debris
- Developed a partnership with a biomass company (T2) to grind woody debris from FireFree defensible space efforts and the fuels treatment contracts that the county administers, to produce clean electricity
- Conducted outreach and education seminars
- As liaison with federal and state partners, treated an average of 18,000 acres annually of within the WUI as identified by the CWPPs
- In partnership with Oregon Department of Forestry implemented the Oregon Forestland-Urban Interface Fire Protection Act of 1997

Upper Deschutes Basin Fire Learning Network

The Nature Conservancy, U.S. Forest Service, and the Department of Interior, together with state and local agencies, businesses, landowners, scientists, community groups and conversationalists, created a national Fire Learning Network to catalyze fuel reduction and restoration projects across the county. The Upper Deschutes Watershed, containing 2-million acres is one of the project sites in the first phase of this national network. The Upper Deschutes Fire Learning Network is developing new vegetation maps, forest condition maps and action maps prioritizing treatable areas.

The Upper Deschutes Fire Learning Network is developing a common vision for the landscape utilizing the best available science and incorporating values through collaborative partnerships. The team will also integrate community planning efforts like Community Wildfire Protection Plans with agency and government efforts to generate a vision for future land management. The landscape's products are timed to complement Deschutes National Forest restoration strategy plans.

Winter Storms

Severe winter storms are the second priority in the Natural Hazard Mitigation Plan because of the risk to life and property by creating conditions that disrupt essential regional systems such as public utilities, telecommunications, and transportation routes. Severe winter storms can produce rain, freezing rain, ice, snow, cold temperatures, and wind. Severe winter storms involving heavy snow fall and cold temperatures occur more often than incidences of rain, freezing rain and ice storms. Increased population, including new residents less familiar with cold, snowy winters make Deschutes County more vulnerable to severe winter storms.

A severe winter storm is generally a prolonged event involving snow and cold temperatures. The characteristics of severe winter storms are determined by the amount and extent of snow, air temperature, and event duration. Severe storms have various impacts in different parts of the county. There may be a 20 degree temperature difference from Terrebonne in the north part of the county and La Pine in the south. The recurrence interval for severe winter storms throughout Oregon is about every 13 years, however, there can be many localized storms between these periods according to the Oregon Natural Hazard Assessment Plan.

Flooding

The third priority natural disaster is flooding. Generally, river flooding along the Deschutes River has not historically been a serious problem in Deschutes County. This is due to the porous nature of the geology, irrigation diversion canals and reservoir retention. Studies completed by the U.S. Army Corp of Engineers have resulted in designating a 100 year flood plain for the Little Deschutes River and Whychus Creek. Regular flooding events have occurred near the headwaters of Tumalo Creek and in the Tumalo community. Along Whychus Creek, the city of Sisters frequently experiences flooding, with the most significant event occurring in 1964.

A second area of concern focuses on the potential of flooding related to the failure of glacial moraine dams that impound high-altitude lakes around the three Sisters and Broken Top. Much of the Deschutes River Canyon is cut in basaltic lava flows, ash flows, or sedimentary rocks of the Deschutes formation. These rock types are generally stable, but in many places the canyon walls are steep to vertical. Mountain streams that begin in glacial lakes behind dams of ice or moraines can occasionally be emptied rapidly and result in flash floods with accompanying mud

flows. In the event of volcanic, earthquake or a large avalanche of rock or ice into the lakes, these dams could release floods of water and debris whose major impact would be restricted to the hazard zone but which could inundate areas adjacent to streams.

Carver Lake, which lies in the headwaters of the South Fork of Whychus Creek, and the lake on the east side of Broken Top that drains to Sparks Lake by way of Crater Creek and Soda Creek, are judged the most likely lakes to generate future floods or debris flows large enough to affect areas beyond the proximal hazard zone. Others of less hazard include several small lakes in the headwaters of Whychus Creek and the basin below Collier Glacier at the head of White Branch.

A third potential exists for sheet flooding occurring on frozen or impervious ground. These events are rare and generally found in localized areas and may occur during winter months and after significant rain. Flash flooding may occur in areas of moderate to steep slopes with sparse vegetation. With the occurrences of thunderstorms, these areas become susceptible to flooding and subsequent soil erosion. This situation would be typified by the eastern part of Deschutes County and areas without permanent streams.

U.S. Geological Survey scientists and U.S. Corp of Engineer studies indicate the county is at a low level of risk for catastrophic flooding. Studies of Carver Lake estimate the probability of a lake flash flood to be approximately 1-5% annually. Potentially, the Little Deschutes and Whychus Creek are most vulnerable, however greater risks are related to future volcanic eruptions which U.S. Geological Survey scientists place at a low level of risk.

Volcanic Eruption and Earthquakes

Volcanic eruption and earthquakes are tied for fourth priority. The complex geology of Deschutes County, with geologically recent eruptions, increases the potential for these types of natural disasters.

Volcanic Eruptions

Two long-lived volcanic centers, Three Sisters to the west and Newberry Volcano to the south, and many tens of smaller volcanoes have hosted numerous eruptions in geologically recent times that range widely in size and character. Some covered sizable, currently developed areas with lava flows or swiftly moving flows of searing ash and pumice. Others only managed to produce small volumes of ash that blew downwind and were barely detectable in the geologic record, or they produced lava flows in areas now protected as wilderness.

Large snow-covered volcanoes of the Three Sisters volcanic center dominate Central Oregon's landscape between Santiam Pass in the north and Willamette Pass in the south. Rapidly developing areas in Deschutes County occupy the eastern border of the region. No eruptions have occurred in Deschutes County during the past 1,000 years, however the millennium before experienced numerous eruptions, including several at South Sister, many eruptions in the McKenzie Pass and Belknap Crater areas, and one eruption at Newberry Volcano.

Two types of volcanoes exist in the Three Sisters region and each pose distinct hazards to people and property. South Sister, Middle Sister, and Broken Top are major composite volcanoes clustered near the center of the region and have erupted repeatedly over tens of thousands of years. These volcanoes may erupt explosively in the future. In contrast, mafic volcanoes, which range from small cinder cones to large shield volcanoes like North Sister and

Belknap Crater, are typically short-lived (weeks to centuries) and erupt less explosively than do composite volcanoes. Hazardous events include eruption triggered events such as fallout of volcanic ash or lava flows as well as non-eruption events such as landslides from the steep flanks of large volcanoes or floods.

Earthquakes

Earthquakes are possible from four sources, though expert opinions vary regarding the degree of susceptibility from each. The four sources are:

- the off-shore Cascadia Fault Zone,
- deep intraplate events within the subducting Juan de Fuca Plate,
- shallow crustal events within the North American Plate, and
- earthquakes associated with renewed volcanic activity.

All have some tie to the subducting (diving) of the dense, oceanic Juan de Fuca Plate under the lighter, continental North American Plate.

Volcanic earthquakes are commonly smaller than about magnitude 2.5, roughly the threshold for shaking felt by observers close to the event. Swarms of small earthquakes may persist for weeks to months before eruptions, but little or no damage would occur to buildings in surrounding communities. Some volcanic related swarms may include earthquakes as large as about magnitude 5. For the communities of Bend, La Pine, and Sunriver, shallow earthquakes in the magnitude 4-5 range that are located beneath Newberry volcano would cause walls to rattle or windows and dishes to vibrate.

Tectonic earthquakes occur periodically in south-central and southeast Oregon, and they are capable of exceeding the magnitude of volcanic earthquakes. Newberry Volcano lies in an area whose land forms result from earthquake activity. Tectonic earthquakes as large as magnitude 7 may strike areas south and east of Newberry. Statistically speaking, Central Oregon residents are far more likely to feel earthquake shaking than to witness an eruption in the area.

The Cascadia Subduction Zone located off the Oregon Coast generates an earthquake on average every 500-600 years. However, as with any natural processes the average time between events can be misleading. Some of the earthquakes may have been 150 years apart while some closer to 1,000 years apart. Establishing a probability for crustal earthquakes is difficult given the small number of historic events in the region.

The Deschutes County Sheriffs Office Emergency Services has been working closely with the Red Cross on earthquake preparedness in the event of a major quake on the Cascadia Subduction Zone. The focus is less on local earthquake damage, which is anticipated to be minimal, than on secondary impacts. An earthquake could damage the roads that are needed to supply Central Oregon and as the roads re-open could lead to an influx of refugees from west of the Cascade Mountains. Planning ahead allows the County to manage these impacts.

Section 3.5 Natural Hazards Policies

Goal and Policies

Goal 1 **Protect people, property, infrastructure, the economy and the environment from natural hazards.**

Policy 3.5.1 Adopt by reference the most recent Deschutes County Natural Hazards Mitigation Plan into this Plan.
a. Review and evaluate this Section of the Comprehensive Plan every five years.
b. Adopt by reference Community Wildfire Protection Plans and revisions into this Plan.

Policy 3.5.2 Cooperate and coordinate with stakeholders to:
a. Analyze and address natural hazards;
b. Raise public awareness of natural hazards;
c. Support research or studies on natural hazard issues and solutions.

Policy 3.5.3 Coordinate with emergency service providers when new development is proposed.

Policy 3.5.4 Provide incentives and if needed regulations, to manage development in areas prone to natural hazards.

Policy 3.5.5 Development should be designed to minimize alteration of the natural land form in areas subject to slope instability, drainage issues or erosion.

Policy 3.5.6 Critical facilities (schools, churches, hospitals and other facilities as defined by the Federal Emergency Management Agency) should be located outside high risk natural hazard areas, where possible.

Policy 3.5.7 Address wildfire danger particularly in the wildland urban interface.
a. Survey and map wildfire hazard at risk areas using the Wildfire Hazard Identification and Mitigation System.
b. Survey and map all areas not protected by structural fire protection agencies.

Policy 3.5.8 Support forest management practices that reduce severe wildfire hazard areas, as identified by the Wildfire Hazard Identification and Mitigation System, to a low or moderate rating, particularly in areas with development.

Policy 3.5.9 Support local fire protection districts and departments in providing and improving fire protection services.

Policy 3.5.10 Regulate development in designated floodplains identified on the Deschutes County Zoning Map based on Federal Emergency Management Act regulations.
a. Participate in and implement the Community Rating System as part of the National Flood Insurance Program.
b. Cooperate with other stakeholders to identify alternatives for acquiring and/or relocating existing structures prone to flooding.

Policy 3.5.11 Review and revise County Code as needed to:

a. Ensure that land use activities do not aggravate, accelerate or increase the level of risk from natural hazards.
b. Address wildfire concerns to and from development, through consideration of site location, building construction and design, landscaping, defensible space, fuel management, access and water availability.
c. Require development proposals to include an impact evaluation that reviews the ability of the affected fire agency to maintain an appropriate level of service to existing development and the proposed development.
d. Minimize erosion from development and ensure disturbed or exposed areas are promptly restored to a stable, natural and/or vegetated condition using natural materials or native plants.
e. Ensure drainage from development or alterations to historic drainage patterns do not increase erosion on-site or on adjacent properties.
f. Make the Floodplain Zone a combining zone and explore ways to minimize and mitigate floodplain impacts.
g. Require new subdivisions and destination resorts to achieve FireWise Standards from the beginning of the projects and maintain those standards in perpetuity.