COMMUNITY DEVELOPMENT

MEMORANDUM

TO: Deschutes County Planning Commission

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

DATE: October 15, 2020

SUBJECT: Deschutes 2040 / Orientation to Statewide Planning Goal 5 / Part I. Water Resources and Wildlife

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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 4 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 5

Goal 5 – Natural Resources, Scenic and Historic Areas, and Open Spaces

Goal 5 requires local governments to adopt programs that will protect natural resources and conserve scenic, historic, and open space resources for present and future generations. It is a broad statewide planning goal that covers more than a dozen resources. The resources range from wildlife habitat to historic places to surface mines. To protect and plan for them, local governments are asked to create a number of inventories. The inventories in a local plan may address only a portion of the resources included in Goal 5.

When local governments first developed their Goal 5 plans, they looked at the Goal 5 resources that occurred locally and were important to address. Cities and counties reviewed land uses allowed on or near each resource site that might have a negative impact on the resource. Jurisdictions then decided a level of protection appropriate for each resource site and adopted codes to implement their policies. State administrative rules for implementing Goal 5 have been adopted and amended over the years. As local governments update their plans and codes they have the opportunity to adopt policies and codes that are consistent with current Oregon Administrative Rules (OARs) for Goal 5.[1]

The "Goal 5 Process" starts with an inventory of Goal 5 resources. Resource sites are assessed and significant sites are protected. OARs for some Goal 5 resource categories rely on inventories and assessments that have been conducted by state or federal entities. There are eight Goal 5 resource categories that rely on state or federal inventories:

- Wild and scenic rivers
- State scenic waterways
- Ground water resources
- Natural Areas
- Oregon recreation trails
- Wildlife Habitat
- Greater Sage Grouse
- Wilderness areas

[1] As noted in Oregon Administrative Rule (OAR) 660, Division 23, Section 0250 of the new Goal 5 rule: (1) This division replaces OAR 660, Division 16, except with regard to cultural resources * * *. Local governments shall follow the procedures and requirements of this division * * * in the adoption or amendment of all plan or land use regulations pertaining to Goal 5 resources. The requirements of Goal 5 do not apply to land use decisions made pursuant to acknowledged comprehensive plans and land use regulations.

Four categories require local inventories: riparian corridors, wetlands, surface mining, and energy sources. Initiating an inventory and completing the Goal 5 process for the remaining resource categories is optional: historic resources, open space, and scenic view sites. There are separate OARs for each Goal 5 resource category. Many of the rules have not been revised since 1996 and rely on Periodic Review as a trigger for compliance. Since many jurisdictions are no longer required to enter into periodic review, a State process for updating comprehensive plans.[2] Many local plans and codes are not consistent with the current Goal 5 standards.

The following OARs implement Goal 5:

- OAR 660-016 – Complying with Statewide Planning Goal 5
- OAR 660-023 – Procedures and Requirements for Complying with Goal 5

III. Deschutes County Comprehensive Plan

Section 2.4 – Goal 5 Overview

Section 2.4 provides an overview of Deschutes County's Goal 5 inventories. Goal 5 and its implementing OARs required Deschutes County to inventory various resources and determine which items on the inventory were significant. For sites identified as significant, an Economic, Social, Environmental and Energy (ESEE) analysis, a decision-making tool, was required. The ESEE led to one of three choices: preserve the resource, allow proposed uses that conflict with the resource, or strike a balance between the resource and the conflicting uses. Deschutes County completed its Goal 5 inventories and the ESEE analysis during Periodic Review, a State process for updating comprehensive plans which lasted from 1988-2003. The inventories and implementing regulations were acknowledged by the Department of Land Conservation and Development (DLCD).

PART I.
Section 2.5 – Water Resources

Section 2.5 is extensive, highlighting the interface between water management and land use planning. Considerable effort is made to discuss:

- Regional water coordination
- Deschutes Basin hydrology
- Water rights
- Water conservation
- Deschutes Basin ecosystem
- Riparian areas and wetlands
- Floodplains
- Instream flows
- Fish and aquatic habitat
- Deschutes River Mitigation and Enhancement Program
- Surface and groundwater quality

[2] Periodic Review is a term used in Oregon law to describe the periodic evaluation and revision of a local comprehensive plan. Since 1981, state law (ORS 197.628 - 636) has called for cities and counties to review their comprehensive plans according to a periodic schedule established by the Land Conservation and Development Commission (LCDC). In 2003, the Legislature eliminated Periodic Review requirement for counties by passing SB 920.

Table 2 identifies prominent Goal 5 Water Resource inventories affecting private property. All base zones, including the Flood Plain zone in Title 18, County Zoning, require a 100-foot riparian setback for structures from ordinary high water (OHW). Wetland vegetation, including removal-fill activities, are regulated in Deschutes County Code (DCC 18.120.070, Fill and Removal).

Table 2 - Deschutes County Significant Water Resource Inventories

Inventoried Resource	Conflicts	Comments
Fish Habitat (Inventory – Ord. No. 92-041, page 18; creeks, rivers and lakes)	Major conflicts are removal of riparian vegetation, fill and removal activities within the bed and banks of streams or wetlands, hydroelectric, rural residential development and water regulation	Floodplain zone recognized as program to achieve the goal to conserve fish habitat (Ordinance Nos. 88-030, 88-031, 89-009). Others include: fill and removal permits, wetland removal regulations, hydro prohibitions, rimrock setbacks, 100' setback from OHW, conservation easements and restrictions on boats and docks.
Wetlands and Riparian Areas (Inventory – Ord. No. 92-041 – page 73; identified on USFWS NWI)	Conflicting uses include fill and removal of material, including vegetation which could cause reduction in the size or quality or function of a wetland or cause destruction or degradation of the riparian habitat and vegetation. Structural development in wetlands or riparian areas educe the habitat and the use of the structure could cause conflicts such as harassment or disturbance or wildlife dependent on the habitat. Cutting of riparian vegetation can remove important shade for streams, eliminate habitat for various waterfowl, furbearers, and nongame bird species and can also increase the potential for erosion or bank instability	Floodplain zone recognized as program to achieve the goal to conserve wetland and riparian habitat (Ordinance Nos. 88-030, 88-031, 89-009). Others include: fill and removal permits, wetland removal regulations, hydro prohibitions, 100' setback from OHW, conservation easements, restrictions on boats and docks, and Landscape Management Combining Zone.

Inventoried Resource	Conflicts	Comments
UPDATE – Riparian inventory – Ord. No. 94-007; Significant riparian habitat is located in three areas: Area within 100' of OHW of an inventoried stream or river; Area adjacent to an inventoried river or stream and located within a flood plain mapped by FEMA and zoned flood plain by the county (Deschutes River, Little Deschutes River, Paulina Creek, Fall River, Indian Ford Creek, Tumalo Creek, Squaw (Whychus) Creek, and Crooked River Area adjacent to a river or stream and inventoried as a wetland on the NWI	Conflicting uses: Locating septic systems in riparian area could cause pollution of ground and surface water systems. The potential for this conflict depends on the characteristics of the soil. Locating structural development in riparian areas can reduce the habitat and the use of structures could cause conflicts such as harassment or disturbance of wildlife dependent on habitat. Recreational use of the riparian area including boat landing areas, formal and informal trails and camping areas soil composition and destruction of vegetation. Increase in density of residential lots in or adjacent to riparian areas could result in a decrease of habitat effectiveness because of disturbance to wildlife	Riparian Areas inventory and ESEE analysis adopted by Ordinance No. 92-041 is deleted and replaced by an inventory and ESEE contained in Exhibit A. New parcels meeting the minimum lot size in the resource zones (EFU, Forest, non-exception flood plain) will not cause an increase in residential density that would conflict with riparian habitat values. In RR10, MUA-10, and Flood Plain zone found adjacent to inventoried riparian areas, the creation of new 10 acre parcels would not significantly increase the overall density of residential use adjacent to riparian areas because the areas where new parcels could be created, with the exception of Tumalo Creek, are already divided into lots considerably smaller than 10 acres. Program to achieve Goal 5 for Riparian Habitat: fill and removal regulations to protect wetlands, 100' setback from OHW, Flood plain zone (regulates docks too), Landscape Management Combining Zone, Conservation easements, State Scenic Waterway

Inventoried Resource	Conflicts	Comments
UPDATE – Wetland Inventory – Ord. No. 94-007, Exhibit B – inventory is NWI (Ord. No. 92-045)	Conflicting uses include fill and removal of material, including vegetation, which could cause reduction in the size, quality or function of a wetland. Locating structural development in wetlands could reduce the habitat and the use of the structure could cause conflicts such as harassment or disturbance of wildlife dependent on the habitat. Draining wetlands for agriculture of other development purposes destroys the hydrological function of the wetland and alters the habitat qualities that certain wildlife depend on. Cutting wetland vegetation adjacent to streams can remove important shade for streams, eliminate habitat for various waterfowl, furbearers, and nongame bird species and can also increase the potential for erosion or bank instability in riparian areas.	Wetlands Inventory and ESEE analysis adopted by Ordinance No. 92-041 is deleted and replaced by an inventory and ESEE contained in Exhibit B, Wetlands. Program to achieve Goal 5 for Wetland Habitat: • Fill and removal regulations to protect wetlands • 100' setback from OHW • Flood plain zone (regulates docks too) • DSL Removal / Fill law
State Scenic Waterways and Federal Wild and Scenic Rivers (Inventory – Ord. No. 92-052, Exhibit E, Page 1;	See County / City of Bend River Study and 1986 River Study Staff Report. Both referenced in Ord. 92-005, Exhibit E.	Program for resource protection includes: floodplain zone and restrictions, fill and removal permits, wetland removal regulations, hydro prohibitions, rimrock setbacks, conservation easements, restrictions on boats and docks, and Landscape Management Combining Zone.
Ecologically and Scientifically Significant Natural Areas * Little Deschutes River / Deschutes River Confluence (Inventory – Ord. No. 92-052, Exhibit B, Page 1; identified by Oregon Natural Heritage Program); Analysis of Pringle Falls and Horse Ridge Research Areas, West Hampton Butte and Davis Lakes excluded b/c they are on federal land and/or not related to flood plains.	Resort and vacation home development, recreational uses and livestock grazing, fill and removal in wetlands are conflicting uses.	Programs for resource protection include the zoning of the property, the provisions of the flood plain, wetlands and the river corridor. The implementing measures which protect and regulate development in the confluence area are: EFU zoning, Flood Plain zoning, conservation easements, and fill and removal. The confluence area is located in the undeveloped open space area of the Sunriver development (Crosswater). 80% of the property is retained as open space. Today, zoning is Flood Plain and Forest Use.

Since the Comprehensive Plan was last updated in 2010, several issues have emerged in relation to Water Resources:

1. Oregon Spotted Frog, Habitat Conservation Plan and Irrigation District Efficiencies. The Deschutes Basin Board of Control and City of Prineville (Applicants) have prepared a Habitat Conservation Plan (HCP) under Section 10 of the federal Endangered Species Act to protect them from liability associated with operations that could affect the Oregon Spotted Frog, a federally threatened species. The Applicant's HCP proposes moderating winter and summer flows for the Upper Deschutes River system to address years of degraded habitat. As proposed, the potential action focuses entirely on water conservation measures (piping, on farm efficiency measures) that will take several years to implement over the 30-year permit period of the HCP. The U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) anticipate a final HCP and a final Environmental Impact Statement (EIS) will be published in the Federal Register in early November 2020.

2. National Marine Fisheries Service (NMFS) / Biological Opinion. On April 14, 2016, NMFS issued the Federal Emergency Management Agency (FEMA) a Biological Opinion (BiOp) concluding that FEMA's implementation of the National Flood Insurance Program (NFIP) in Oregon violated the Endangered Species Act (ESA) by allowing and encouraging floodplain development that jeopardizes the continued existence of 16 ESA-listed anadromous fish species and Southern Resident killer whales, and results in the destruction or adverse modification of critical habitat for the fish species. Based on that conclusion, NMFS directed FEMA to change its floodplain mapping protocols and minimum floodplain regulatory criteria and to enforce these new standards against local governments in Oregon. As a primary component of the Oregon BiOp, NMFS outlined six separate Reasonable and Prudent Alternatives (RPAs) to ensure FEMA's implementation of the NFIP avoids further harm to listed species.[3]

   Deschutes County is not subject to the FEMA proceedings. Reintroduced steelhead above Round Butte Dam are part of an experimental population (ESA 10j). This includes the Crooked River system up to Bowman and Ochoco Dams, the Deschutes River up to Big Falls, Whychus Creek, and the Metolius River system. Under the ESA, the experimental population upstream of Round Butte Dam has the status of being "proposed for listing," meaning that consultations under the ESA are not required unless it is determined that some activity may jeopardize the Middle Columbia River Distinct Population Segment (a rare determination). The experimental designation sunsets in 2025.

3. South County Local Wetland Inventory. Adopted in 2011, the South County Local Wetland Inventory (LWI) replaced the National Wetland Inventory (NWI) map for South County and improved the accuracy in the identification of jurisdictional wetland characteristics in the upper Deschutes Basin because unlike the NWI, the South County LWI identified wetlands within an accuracy of 5 meters. The LWI study area covered 18,937 acres from Sunriver to south of La Pine. It is the largest LWI in Oregon. Although the LWI was justified under Statewide Planning Goal 6,

[3] Reasonable and prudent alternatives refer to actions identified during formal consultation that "1) can be implemented in a manner consistent with the intended purpose of the action, 2) can be implemented consistent with the scope of the Federal agency's legal authority and jurisdiction, 3) are economically and technologically feasible, and 4) that the listing agency's Director believes would avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat (50 CFR 402.02)[...]"

Water Quality, based on water quality functions, the 114 identified wetlands, 0.5 acre or larger, also provide wildlife habitat.[4]

4. Water Panel. Realizing the impact of water use and water law in land use and development proceedings, the Planning Commission requested staff to organize a series of expert panels within the field of water management in 2018.[5] Topics addressed:

   - Hydrology of the Upper Deschutes Basin
   - Environmental and Economic Impacts
   - Agricultural Water Consumption and Efficiency
   - Projections and Planning

   The Planning Commission identified the following key issues and themes:

   Water law

   Current laws regulating water strictly limit flexibility in water use and management, and are little changed in principle from the original regulations developed in the early twentieth century. Comments from almost all panelists denoted a need to revise Oregon's water laws to reflect current (and future) conditions; to re-examine the principles of allocation (for agriculture, fisheries, municipalities, environmental groups and other sectors), the efficiency of delivery, flexibility in use and monitoring and enforcement.

   Statewide water policy

   Many stakeholders are involved in water management including sovereign tribal nations, governmental entities, nonprofits, irrigation districts, private consultants, and water users. Each group has identified interests and perspectives that may align or contradict others, particularly in the areas of advocacy regarding the current system for holding water rights and uses where water rights may be under– or over-allocated. Although improvements could be made in the current system by voluntary collaboration or specific litigation, a larger-scale systematic change is needed, potentially through a statewide governmental review to revisit and modernize water use priorities, allocation, regulation, and management.

   Education and funding

   Panelists offered examples of outreach and educational programs that have proven to be successful in promoting efficient water use in agricultural, commercial, and residential markets. In order to achieve larger-scale change, financial resources are needed, both to improve efficiency in water delivery to end uses (e.g. canal piping) but also to educate water users on efficient practices.

[4] The functions scoring the highest overall for the wetlands inventoried are: Organic Matter Export, Pollinator Habitat, and Aquatic Invertebrate Habitat. Some functions show relatively little variation among the project wetlands (e.g., Carbon Sequestration, Native Plant Diversity), while others vary considerably (e.g., Nitrate Removal, Organic Matter Export). Although most of the assessed wetlands perform similar functions, the values associated with performance of these functions vary considerably. The Oregon Rapid Wetland Assessment Protocol was developed to rapidly and qualitatively assess the functions and values of all types of wetlands identified the following three functions as having the highest value in the project area: phosphorus retention, aquatic Invertebrate habitat, and nitrate removal.

[5] https://www.deschutes.org/sites/default/files/fileattachments/community_development/page/780/water_panel_series_-_final_report.pdf

Water Resource Goals and Policies recognize among others:

- Develop regional, comprehensive water management policies that balance the diverse needs of water users and recognize Oregon water law.
- Work with stakeholders to restore, maintain and/or enhance healthy river and riparian ecosystems and wetlands.
- Support healthy native fish populations through coordination with stakeholders who provide fish habitat management and restoration.
- Review Habitat Conservation Plans for species listed under the Endangered Species Act, to identify appropriate new policies or codes.
- Coordinate with the Oregon Department of Environmental Quality and other stakeholders on regional water quality maintenance and improvement efforts.
- Coordinate with stakeholders to address water-related public health issues.

Section 2.6 – Wildlife

Section 2.6 recaps Deschutes County's wildlife designations starting in the late 1970s. Outside of the Portland Metropolitan area, Deschutes County has the most extensive inventories of any Oregon county. During Periodic Review Deschutes County addressed:

- Deer Winter Range
- Deer Migration Corridors
- Elk
- Antelope
- Sensitive Birds
- Waterfowl
- Upland Game Birds
- Furbearers
- Townsend Big Ear Bats

Table 2 identifies prominent Goal 5 Wildlife inventories affecting private property. DCC Chapters 18.28, Conditional Use; 18.88, Wildlife Area Combining Zone; 18.90, Greater Sage Grouse Combining Zone; 18.90, Sensitive Bird and Mammal Combining Zone; and 18.96 Flood Plain Zone, among others, protect significant wildlife habitat by regulating development.

Table 3 - Deschutes County Significant Wildlife Inventories

Inventoried Resource	Conflicts	Comments
Deer Winter Range (Inventory – Ord. No. 92-041, page 22; Metolius, Tumalo, North Paulina, and Grizzly ranges identified by ODFW	Major conflicts are dwellings, roads and dogs. Activities which cause deterioration of forage quality and quantity or cover are conflicting uses. Fences which impede safe passage are also a conflicting use.	Floodplain zone recognized as a program to achieve the goal to protect deer winter range (Ordinance Nos. 88-030, 88-031, 89-009). Others include Wildlife Area Combining Zone. Requires 40-acre minimum lot size for all new residential land divisions. Underlying zoning in most of the deer winter range is: EFU, Forest Use and Flood plain. These zones provide for large lot sizes and limit uses that are not compatible with farm or forest zones.

Inventoried Resource	Conflicts	Comments
Deer Migration Corridor (Inventory – Ord. No. 92-041, page 26; Bend-La Pine migration corridor identified by ODFW)	Major conflicts are dwellings, roads and dogs. Fences which impede safe passage are also a conflicting use.	Wildlife Area Combining Zone was recognized as the only program to achieve the goal to protect the deer migration corridor. Underlying zoning is RR-10. It was amended to require cluster development for all land divisions in the RR-10 zone in the Bend/La Pine migration corridor (92-042). A 20 acre parcel is the minimum size required for a cluster development. Siting and fencing standards also apply in the deer migration corridor. Migration corridor includes some EFU, Forest and Floodplain zoned land. These resource zones provide for large lot sizes and limit uses.
Elk Habitat (Inventory – Ord. No. 92-041 – page 32; identified by USFS and ODFW)	Major conflict is the loss of habitat due to increase residential densities in the habitat areas. Increase human disturbance can cause conflict with elk. The use of land which necessitates the removal of large amounts of vegetative cover can also alter the quality of elk habitat.	Wildlife Area Combining Zone was recognized as the only program to achieve the goal to protect the elk habitat. It was amended to require a 160 acre minimum lot size for areas identified as significant elk habitat. Siting standards are required to minimize conflicts of residences with habitat protection. Underlying zoning in the elk habitat areas is either flood plain, forest, or open space and conservation. These resource zones restrict high density residential development and prohibit industrial and commercial uses. * Some lands are zoned RR10, including lots that are split zoned with flood plain. They are already parcelized, preventing future land divisions.
Antelope Habitat (Inventory – Ord. No. 92-041 – page 38; identified by ODFW)	Land use or development activities which would result in the loss of habitat, and animal harassment and disturbance associated with human activity.	To achieve the goal to conserve antelope habitat, uses conflicting with antelope habitat are limited to the Wildlife Area Combining Zone. In antelope range, the minimum lot size is 320 acres. Except for rural service centers, the antelope habitat is zoned EFU or F1.
Habitat for Sensitive Birds (Inventory – Ord. No. 92-041 – page 41 and Table 5; identified by ODFW, ODF, OSU, Oregon Natural Heritage Data Bases). The area required for each nest site various between species.	Nest sites are found in forest, EFU and Open Space and Conservation zones. Uses that could conflict with the habitat site are surface mining, residential use, recreation facilities, roads, logging and air strips. Any activity which would disturb the nesting birds, including intensive recreational use or removal of trees or vegetation could conflict with the habitat site.	The Sensitive Bird and Mammal Combining Zone achieves the goal to protect sensitive bird sites.

Inventoried Resource	Conflicts	Comments
(**UPDATE -** Inventory – Ord. No. 94-004 –pages 3 to 140 Site specific ESEE analysis and decisions follow each site.	See above.	Habitat areas for sensitive birds of the Fish and Wildlife Element, adopted in No. 92-041 is repealed and replaced by inventories in Exhibit 1. Area required around each nest site needed to protect the nest from conflict varies between species. It's called "sensitive habitat area." Note: Northern bald eagle, osprey, golden eagle, prairie falcon and great blue heron rookeries are located on federal land. Classified as "2A"Goal 5 Resources. Great Grey owl site no longer exists. Some bald eagle, golden eagle sites are controlled by the Sensitive Bird and Mammal Combining Zone.
Waterfowl Habitat (Inventory – Ord. No. 92-041 – page 56; includes all rivers, streams, lakes and perennial wetlands and ponds identified on the 1990 US Fish and Wildlife Wetland Inventory Maps; ODFW provided lists of all bird species; Co/City of Bend River Study provides additional information)	Future resort and vacation home development, human activity associated with recreation along rivers and lakes, timber-cutting around sensitive habitats, fill and removal of material in wetlands and within the bed and banks of rivers and streams and removal of riparian vegetation are conflicting uses.	Floodplain zone recognized as program to achieve the goal to conserve waterfowl habitat (Ordinance Nos. 88-030, 88-031, 89-009). Others include: fill and removal permits, wetland removal regulations, rimrock setbacks, 100' setback from OHW, conservation easements, restrictions on boats and docks, Landscape Management Combining Zone, State and federal scenic water regulations. In addition, the forest and EFU zones require large minimum lot size which limits the potential density of development in the areas adjacent many of the rivers, streams wetlands and ponds used for waterfowl habitat.
Upland Game Bird Habitat (Inventory – Ord. No. 92-041 – page 60; ODFW did not identify critical habitat for any of the upland game species except for the sage grouse; habitat for upland game birds is dispersed throughout the county in riparian, forest, agricultural and rangeland areas)	Pheasant and quail are affected whenever agricultural land is taken out of production through urban sprawl, road construction, industrial development and other land clearing activities. Farming practices on existing agricultural lands also have an impact. Fence row, woodlots, and riparian vegetation are constantly being removed at the expense of upland bird use. Chapter 6 of Co/City of Bend River Study identifies conflicting uses with upland bird habitat.	For all of the upland game birds except sage grouse, the habitat is adequately protected by the existing EFU and forest zoning and the provisions to protect wetlands and riparian areas to achieve the goal of protecting upland game birds. County provisions to protect riparian areas and wetlands protect one of the most significant components of upland game habitat. Note: conflicts with sage grouse are limited by EFU zoning with a 320 acre minimum parcel size. Sensitive Bird and Mammal Combining Zone pertaining to sage grouse and leks have been repealed due to LCDC enacted rules in OAR 660, Division 23.

Inventoried Resource	Conflicts	Comments
UPDATE - Inventory – Ord. No. 94-004 –pages 156-201.	See above.	Habitat areas for Upland Game Bird Habitat, adopted in No. 92-041 is repealed and replaced and further amended in Exhibit 4 with the ESEE Analysis and inventory for upland game bird habitat. Conflicts with sage grouse are reduced by the limitations on uses in the EFU and flood Plain zone, by the 320 acre minimum lot size and predominance of BLM. Note: conflicts with sage grouse are limited by EFU zoning with a 320 acre minimum parcel size. Sensitive Bird and Mammal Combining Zone pertaining to sage grouse and leks have been repealed due to LCDC enacted rules in OAR 660, Division 23.
Furbearer Habitat (Inventory – Ord. No. 92-041 – page 65; ODFW has not identified any specific habitat sites other than riparian and wetland areas that are critical for the listed species.	The conflicting uses are those activities or development which would degrade or destroy habitat or disturb the animals causing them to relocate. Conflicts between furbearers and other land uses are minimal in the county.	Furbearer habitat is adequately protected by the existing EFU and forest zoning and the provisions to protect farm use and forest zoning and the provisions to protect wetlands and riparian areas to achieve the goal to protect furbearers. The farm and forest zones require large minimum lot sizes and many uses are permitted only as conditional uses. The measures to protect riparian and wetland habitat are detailed in this plan in the Riparian and Wetland Habitat section.
Habitat Areas for Townsend's Big-Eared Bats (Inventory – Ord. No. 92-041 – page 69; identified by ODFW, ODF, OSU, Oregon Natural Heritage Data Bases)	Caves located in EFU zones. Uses permitted in those zones that could conflict with the habitat site are surface mining, recreation facilities including golf courses and destination resorts, roads, logging, and air strips.	Program to achieve the goal is Sensitive Bird and Mammal Combining Zone
UPDATE - Inventory – Ord. No. 94-004 –pages 140 to 155 Site specific ESEE analysis and decisions follow each site.	See above.	Habitat areas for Townsend Bats, adopted in No. 92-041 is repealed and replaced and further amended in Exhibit 2. The ESEE for Townsend's big-eared bats is amended for additional bat sites in Exhibit 3.

Since the Comprehensive Plan was last updated in 2010, a few issues have emerged related to wildlife inventories and protection measures:

1. Sage Grouse Habitat. In 2015, Deschutes County adopted Oregon Department of Fish and Wildlife's (ODFW) Greater Sage-Grouse Habitat Area Inventory Map (Core Area, Low Density Area, and General Habitat, including occupied and occupied-pending lek locations) and removed Deschutes County's 1990 sage-grouse inventory and lek locations from the Sensitive Bird and Mammal Habitat Inventory. This effort among many others, compelled USFWS to determine that federal land management plans and partnerships with states, ranchers, and Non-Governmental Organizations

(NGOs) adequately protected sage-grouse habitat, thereby averting a federal endangered species listing.

2. Cluster Developments. Two cluster subdivisions, Miller Tree Farm and Westgate (Westside Transect) located west of Bend, approved in 2014 and 2019, integrated mandatory open space (65 to 80% of the area), wildfire mitigation and wildlife habitat measures managed in perpetuity by homeowners' associations. These requirements, leveraged through conditional use criteria and approved by the Board of County Commissioners, require professional biologists and wildlife experts to submit reports to the Community Development Department every 3 to 5 years, demonstrating how both goals are being met. These two decisions set precedent for future cluster developments.

Wildlife Goals and Policies recognize among others:

- Promote stewardship of wildlife habitats and corridors, particularly those with significant biological, ecological, aesthetic, and recreational value.
- Support incentives for restoring and/or preserving significant wildlife habitat by traditional means such as zoning or innovative means, including land swaps, conservation easements, transfer of development rights, tax incentives or purchase by public or non-profit agencies.
- Ensure Goal 5 wildlife inventories and habitat protection programs are up-to-date through public processes and expert sources.
- Use a combination of incentives, regulations and, education to promote stewardship of wildlife habitat and address the impacts of development.
- Develop local approaches, in coordination with Federal and State agencies, for protecting Federal or State Threatened or Endangered Species or Species of Concern.

III. Invited Guests

- Caroline House, Deschutes County Assistant Planner, will participate in the work session. She will discuss rural development in relation to Deschutes County's wildlife protection measures.

Attachments:

Comprehensive Plan
- Section 2.4
- Section 2.5
- Section 2.6
- Section 5.3
- Section 5.4

Section 2.4 Goal 5 Overview

Background

Many County resources are protected through Statewide Planning Goal 5, Natural Resources, Scenic and Historical Areas and Open Spaces. Further direction on protecting these resources is provided in Oregon Administrative Rule (OAR) 660-023. It is important to note that OAR 660-016 provided direction when the County did an extensive review of Goal 5 resources primarily in the early 1990s. In 1996 OAR 660-023 replaced OAR 660-016 for all listed resources except cultural resources. The Goal and OAR require local governments to inventory various resources and determine which items on the inventory are significant. For sites identified as significant, an Economic, Social, Environmental and Energy (ESEE) analysis is required. The analysis leads to one of three choices: preserve the resource, allow proposed uses that conflict with the resource or strike a balance between the resource and the conflicting uses. A program must be provided to protect the resources as determined by the ESEE analysis.

Deschutes County completed Goal 5 inventories and the ESEE analysis during Periodic Review, a State process for updating comprehensive plans which lasted from 1988-2003. The County Goal 5 inventories and programs were acknowledged by the Department of Land Conservation and Development as being in compliance with Goal 5. Therefore, the acknowledged Goal 5 inventories, ESEEs and programs are retained in this Plan (although one historic resource is being modified).

OAR 660-023 requires specific Goal 5 resources to be reviewed and amended at each periodic review. However, counties are no longer required to do periodic review. This Plan update is not being done under those regulations.

The following resources are required to be inventoried at each periodic review:

- Federal Wild and Scenic Rivers
- Oregon Scenic Waterways
- Groundwater resources (limited application)
- Natural areas (on the Oregon State Register of Natural Heritage Resources list)

In addition, the following list includes resources the County inventoried during its last periodic review.

- Riparian corridors
- Wetlands
- Wildlife habitat
- Approved Oregon Recreation Trails
- Wilderness areas
- Mineral and aggregate resources
- Energy sources (updated as new sites are proposed)
- Historic resources
- Open spaces
- Scenic views and sites
- Cultural areas

Purpose of Goal 5

The purpose of identifying Goal 5 related lands is to effectively manage Deschutes County's natural and cultural resources to meet the needs of today while retaining their value for future generations. These resources are addressed in the following sections:

Natural Resources

- Water Resources (Section 2.5)
- Wildlife (Section 2.6)
- Open Spaces and Scenic Views and Sites (Section 2.7)
- Energy (Section 2.8)

Other Statewide Planning Goal 5 Resources

- Mining Resources (Section 2.10)
- Historic and Cultural Resources (Section 2.11)

Future Goal 5 Inventories

Although the 2008-2011 Plan update was not completed under periodic review and no updates to the Goal 5 resources were made, the County recognizes the importance of revisiting its Goal 5 resource list. To ensure the appropriate protection of Goal 5 resources, upon adoption of this Plan the County will initiate a Goal 5 technical committee to review its existing inventories and programs. The review will include consideration of existing inventories and programs as well as the cumulative effects of growth on our Goal 5 programs. The complete acknowledged Goal 5 inventory lists as of 2010 can be found in Chapter 5. An incomplete list of County Goal 5 Ordinances can also be found in Chapter 5. Research will continue to identify and list all adopted Goal 5 Ordinances.

Some issues for the Goal 5 review are listed below.

- There are some discrepancies between mapped and listed acknowledged Goal 5 inventories that need to be reconciled.
- Many Goal 5 resources, like wilderness areas, are located on Federal lands and are protected by Federal programs.
- Unlike other Goal 5 resources, amendments to the mining and historic inventories are generally initiated by property owners for specific sites.
- An inventory of Goal 5 wildlife resources was provided by an interagency team made up of Oregon Department of Fish and Wildlife, U.S. Fish and Wildlife, U.S. Forest Service and the Bureau of Land Management. This report was prepared at the request of staff and as part of the Goal 5 review the updated inventories will be reviewed by a technical committee and eventually be recommended for adoption.
- Consider the Deschutes County Greenprint data and community values when reviewing the Goal 5 inventories.

Section 2.4 Goal 5 Overview Policies

Goals and Policies

Goal 1 Protect Goal 5 resources.

Policy 2.4.1 Initiate a review of all Goal 5 inventories and protection programs.

Policy 2.2.2 Until the County initiates amendments to the Goal 5 inventories and programs, all existing Goal 5 inventories, ESEEs and programs are retained and not repealed, except as noted in the findings for Ordinance 2011-003.

Policy 2.4.3 Review Goal 5 resources when a new Goal 5 resource is verified through the applicable state and county process, but at least every 10 years.

Policy 2.4.4 Incorporate new information into the Goal 5 inventory as requested by an applicant or as County staff resources allow.

Policy 2.4.5 As federal lands are sold to private owners, review the impacts to Goal 5 resources.

Section 2.5 Water Resources

Background

Water resource management is impacted by land use planning and includes numerous components from groundwater to river systems and water availability to water quality. Unpolluted water is essential for biodiversity and for human, animal and plant survival. Besides consumption and irrigation, water is also needed for maintaining the river and stream ecosystems that are a large part of Deschutes County's quality of life and economy. Management of this shared resource is a regional priority.

The primary state regulator of water availability is the Oregon Water Resources Department (OWRD). The Oregon Department of Environmental Quality (DEQ) has the primary role in monitoring and enforcing water quality standards. The Oregon DEQ is required to comply with the Federal Environmental Protection Agency.

In addition to those agencies, there are two Statewide Planning Goals relating to the protection of water resources. Statewide Planning Goal 5, Natural Resources Scenic and Historic Areas and Open Spaces, requires an inventory of the following defined water resources. Once inventoried, the Goal requires protection measures. These inventories have been completed and acknowledged by the Land Conservation and Development Commission (See Sections 2.4 and 5.3).

- Riparian Corridors, including water, riparian areas and fish habitat
- Wetlands
- Federal Wild and Scenic Rivers
- State Scenic Waterways
- Groundwater Resources

Statewide Planning Goal 6, Air, Land and Water Resources Quality, requires comprehensive plans to be consistent with state and federal pollution regulations.

The policies in this section provide the framework for evaluating land use actions and define the responsibility of the County to work in partnership with cities, agencies, non-profits and others to achieve efficient use of water resources and effective management of water quality in the Upper Deschutes Basin.

It is important to underscore that the primary water resource management process occurs outside of the state land use planning system. Oregon land use and water management are not integrated. There are no overarching administrative rules that consider statewide water management in conjunction with land use planning.

Regional Water Coordination

Cities, irrigation districts, farmers, non-profits, fisherman and rural residents all have a stake in ensuring adequate quantities of water. Water availability and quality are tied together and are a regional priority. The following are the primary agencies and organizations involved in water management.

Oregon Water Resources Commission and Water Resources Department

The Water Resources Commission oversees the Oregon Water Resources Department that manages the amount of water flowing through, and being diverted from Oregon's water bodies. Surface and groundwater rights are administered through this department.

The Water Resources Department, together with the Department of Environmental Quality, Department of Fish and Wildlife, Department of Agriculture, and stakeholders and partners from around Oregon, is developing the state's first Integrated Water Resources Strategy.

Oregon Department of Environmental Quality

The Department of Environment Quality (DEQ) regulates water quality permits, administers onsite sewage system programs, implements (jointly with Department of Health Services) the statewide drinking water source assessment and protection program, certifies drinking water protection plans for public water supply systems, and administers an underground injection control and an underground storage tank program.

The DEQ is also responsible for carrying out the State's obligation under the federal Clean Water Act. Section 303(d) of the Federal Clean Water Act requires states to identify and list water bodies that do not meet water quality standards. The State will set a total maximum daily load (TMDL) for water bodies that do not meet the quality standards, and the TMDL will calculate the maximum amount of pollutants that can be discharged into the water body while still meeting water quality standards.

Deschutes Water Alliance

The Deschutes Water Alliance (DWA) was formed in 2004 to plan for long-term water resource management in the Deschutes Basin. It is comprised of the following stakeholders:

- The Deschutes Basin Board of Control: an association of 7 irrigation districts that includes North Unit, Central Oregon, Swalley, Tumalo, Three Sisters, Arnold and Ochoco
- The Confederated Tribes of Warm Springs: located in Jefferson County, they are focused on managing water resources as sustainable assets
- Deschutes River Conservancy (DRC): a non-profit organization with a mission to restore streamflow and improve water quality in the Deschutes Basin
- Central Oregon Cities Organization (COCO): includes representatives from the cities of Bend, Culver, La Pine, Madras, Metolius, Prineville, Redmond, and Sisters
- Deschutes County, Jefferson County, Crook County
- Oregon Department of Environmental Quality, Oregon Department of Fish and Wildlife, Oregon Water Resources Department and the Bureau of Reclamation are unofficial members.

The vision of the Deschutes Water Alliance is to balance water resources to serve and sustain agriculture, urban and ecosystem needs. To achieve this vision, the mission is to:

- Improve stream flows and water quality in the Deschutes Basin for the benefit of fish, wildlife and people.
- Secure and maintain a reliable and affordable supply of water to sustain agriculture.
- Secure a safe, affordable, and high quality water supply for urban communities.

Deschutes Basin Hydrogeology

The Deschutes River Basin, from its headwaters to the Columbia River, encompasses 10,400 square miles of the north central part of the State. Nearly 91% of Deschutes County lies within the Deschutes Basin. The upper Deschutes River Basin is characterized by recent volcanic activity and strong and rapid groundwater flows. The geologic conditions lead to a strong connection between surface and ground water (see also Section 3.10).

Groundwater flows eastward from the Cascade Range through permeable volcanic rocks out into the basin and then generally northward. Groundwater recharge comes from precipitation in the Cascade Range, inter-basin flow and leaking irrigation canals. No long-term water-level declines attributable to groundwater pumping were found in the upper Deschutes Basin.

Approximately one-half of the ground water flowing from the Cascade Range discharges to spring-fed streams along the margins of the range. The remaining groundwater flows through the subsurface, and eventually discharges to streams near the confluence of the Deschutes, Crooked, and Metolius Rivers.

The large amount of groundwater discharge in the confluence area is primarily caused by geologic factors. The Deschutes River flows north through permeable rock until it hits a region of low-permeable rock near the confluence area. There the permeable rock strata terminates, forcing water to the surface. Virtually all of the regional groundwater in the upper Deschutes Basin discharges to streams south of the area where the Deschutes River enters this low-permeability terrain, at roughly the location of Pelton Dam.

Assessment of water resources of the upper Deschutes Basin confirms that human activities have significantly altered the flow regime in the basin, but on balance have led to the consumption of only a relatively small amount of available water. These impacts do appear to have had a seasonal impact in the lower Deschutes River (in the early months of the calendar year), the reach where all the changes in storage, diversion and surface-groundwater interactions come together in one place. Yet the most dramatic modifications to the water resources regime are clearly seen in terms of low flows below irrigation district diversions in Bend during the summer and below Wickiup Reservoir in the winter.

Reservoir storage and releases for irrigation have highly altered flows in five of the seven water quality impaired reaches in the basin. The upper Deschutes River reach does not often meet target flows in the winter due to upstream reservoir storage at Crescent Lake, Wickiup and Crane Prairie reservoirs. Irrigation diversions have reduced summer flows in six of the seven water quality impaired reaches. Most reaches experience low summer flows due to irrigation diversions. Prior to current restoration efforts, sections of Whychus Creek and Tumalo Creek typically went dry during the irrigation season due to extensive diversion.

Water Rights

The appropriation and use of water in the State of Oregon are regulated under ORS by the Oregon Water Resources Department. Permits issued by OWRD provide for the necessary and allowed points of diversion for water to be diverted from or released to a water body. All water is publicly owned, and with some exceptions, cities, farms, factory owners, and other water uses must obtain a permit or water right from the OWRD to beneficially use water from any source - whether it is underground, or from lakes or streams. Generally speaking,

landowners with water flowing past, through, or under their property do not automatically have the right to use that water without a permit from the OWRD.

Oregon's water laws are based on the principle of prior appropriation. This means the first person to obtain a water right on a stream is the last to be shut off in times of shortage. During water shortages, the water right holder with the oldest date of priority can demand the water specified in their water right regardless of the needs of junior users. If there is a surplus beyond the needs of the senior right holder, the water right holder with the next oldest priority date can take as much as necessary under their right, and so on down the line until there is no surplus or until all rights are satisfied. The date of application for a permit to use water usually becomes the priority date of the right.

Water Availability

Water Availability Constraints

The availability of surface water for irrigating agriculture in Central Oregon began in the 1860s and accelerated at the turn of the century. Surface water rights in the Deschutes Basin have been limited since the early 1900s. Except for very high flow periods during winter and spring run-off, there is no surface water available for any out-of-stream use in the Deschutes River basin. The lack of surface water availability led new development in the 1990s to turn to groundwater for new water needs. The growing demand for groundwater raised concern that the groundwater permitting process ignored the connection between groundwater and surface water.

In 1995 a moratorium on further groundwater permit approvals was instituted by the Water Resources Commission pending the outcome of a collaborative examination of groundwater in the Upper Deschutes Basin. The study, carried out by the U.S. Geological Survey and the OWRD confirmed that snowmelt infiltrates into the ground and recharges the underlying aquifers. The study also confirmed that aquifer discharge provides much of the surface water to streams in the Deschutes Basin. The results verified the potential for groundwater withdraws to impact surface water flows and cause injury to surface water holders.

Exempt Groundwater Users

Groundwater wells for domestic needs in rural areas are generally classified as an exempt use by the OWRD. Exempt use means water right permits are not required if domestic use is less than 15,000 gallons per day and irrigation is less than one-half acre, or commercial use is less than 5,000 gallons per day. A 2006 study for the Deschutes Water Alliance (*Future Ground Water Demand in the Deschutes Basin*) estimated a 2006 total of 20,000 exempt wells in Crook, Deschutes and Jefferson counties, growing to 32,000 by 2025.

Exempt wells do not currently have to mitigate for their groundwater withdraws. Presentations by the Water Resources Department staff indicate that the subsurface water supply in Deschutes County recharges at the rate of approximately 3,500 cubic feet per second (cfs) and existing exempt wells use in the aggregate only 3-4 cfs. This suggests that additional regulation is not needed at this time. However, future policy discussions may need to consider how exempt wells fit into the overall water picture.

Water Banks

Besides exempt wells, new water is needed for other uses, from satisfying increased demand in cities to destination resorts. To address the limited availability of new water rights, two systems have been set up, both managed by the Deschutes River Conservancy. First the Deschutes Water Alliance set up a voluntary Water Bank as a cooperative, coordinated, transparent and voluntary system to identify and meet the water needs of qualified buyers. It operates in conformance to ORS and through a water marketplace. The Bank facilitates transfers of water rights between different users, including the Deschutes River and its tributaries.

The second system is the Groundwater Mitigation Bank. The Water Resources Commission approved rules for the Deschutes Groundwater Mitigation Program in 2002 under OAR 690-505. Under the Mitigation Program, applicants for new groundwater permits are informed of their mitigation obligation by the OWRD during the first phase of the groundwater permit application process, and that they must provide mitigation before their permit can be issued. Applicants can provide either permanent or temporary mitigation credits. Mitigation credits can be established through instream transfers, aquifer recharge, storage release or conserved water projects.

Water Conservation

Water conservation plays a major role in ensuring adequate water availability. Promoting water conservation leads to an efficient and cost-effective use of resources. Generally, conservation is seen as a win for the community, the economy and the environment.

Oregon State Policy on Conservation and Efficient Water Use

The Oregon Water Resources Commission adopted state policy addressing conservation and efficient water use. Rules to carry out the policy are presented in the OAR 690-086.

The conservation policy stems from a number of factors including:

- Increasingly frequent summer water shortages in many Oregon regions
- Expanding water needs for municipalities due to population growth
- In-stream flow demand in response to state or federal listings of sensitive, threatened or endangered species that depend on streamflow and water quality
- The link between healthy ecosystem functions, water quality, recreation and the Oregon economy

The policy rules were developed to provide a process to facilitate efficient water use and water supply planning consistent with capabilities of the water supplier and the OWRD. Major water suppliers and water users are encouraged by the policy to prepare water management and conservation plans. Implementation of conservation projects can help restore streamflows, stabilize water supplies that provide for economic development and growth.

Irrigation Districts Conservation

Agriculture is estimated to use approximately 90% of the surface water in the Upper Deschutes Basin. Therefore irrigation district conservation efforts can have a significant impact on water availability. Water savings from water conservation projects undertaken by irrigation districts or their patrons can be transferred to instream use for the Allocation of Conserved Water (ORS 537.455 to 537.500, OAR 690-018).

A major conservation initiative by irrigation districts is the piping and lining of irrigation canals. Water seeps out of canals into the permeable rock layer below and is lost to irrigation uses. Piping and lining projects provide benefits such as improving water delivery efficiency, reliability and freeing water for other uses. Concerns have been expressed that the water that leaks from the canals recharges the aquifer, and piping and lining have the potential to lower the water table. Additionally, some residents with open irrigation canals on their properties appreciate the aesthetic and wildlife benefits of the canals.

A number of irrigation district efficiency improvements have been completed since 1997. These improvements, through reducing seepage losses in conveyance systems and improving on-farm efficiency, have reduced water losses by 45,360 acre-feet on an annual basis in the Upper Deschutes Basin. It is estimated that 110,268 acre-feet could be saved annually, based on a Deschutes Water Alliance report *(Irrigation District Water Efficiency Cost Analysis and Prioritization)*. Certain districts have been able to reduce piping project costs by incorporating hydroelectric facilities in suitable reaches.

In 2009 Swalley Irrigation District, Three Sisters Irrigation District and Central Oregon Irrigation District were awarded $3.1 million, $1.3 million and $4.2 million respectively to improve water conservation. Tumalo Irrigation District was awarded $1.8 million in 2010. For Swalley, the funds are the final piece to complete a $14.5 million project involving the piping of 5.1 miles of a 12-mile canal and the construction of a 0.75-megawatt hydroelectric plant. Swalley Irrigation District returned 28 cubic feet per second to the Deschutes River as a result of its piping project, the single largest permanent contribution of water back to the Deschutes River.

Three Sisters Irrigation District will be using its funds to launch the first of a three-phase, $12 million pipeline project that will boost stream flows in Whychus Creek by reducing water loss. The first phase will include converting more than three miles of exposed canal to buried pipe, and replacing aging head gates and monitoring equipment with automated, remotely operating units. The completed project should boost summer stream flows in Whychus Creek by 25 to 30 percent. The final phase of the project will be the construction of 1.5-mega-watt hydroelectric plant similar to the one being built by the Swalley Irrigation District.

Central Oregon Irrigation District utilized the funds to assist in piping a 2.5 mile section of its Pilot Butte Canal permanently conserving 19.6 cubic feet per second to the Deschutes River and for the construction of a 5.0 megawatt hydroelectric facility.

On-Farm Efficiency

Irrigation districts in cooperation with consultants, Soil and Water Conservation Districts and the National Resources Conservation Service have compiled and implemented water conservation plans furthering the goal of improving and identifying on-farm efficiency opportunities. Analysis of on-farm conservation opportunities based on a 1997 Reclamation study show that an additional 112,410 to 146,698 acre-feet of water could be saved if on-farm efficiency were improved to 70-80% across all districts.

Other Conservation Efforts

Since water resources in Deschutes County are shared, there is a responsibility for all residents and visitors to use water wisely. Irrigation districts and cities are the primary water users in

Deschutes County and have their own plans for water conservation. Although not actively involved in those efforts, the County can be open to partnerships as requested. Partnerships can also be an option for small water districts outside city limits that are interested in water conservation efforts. Individual water users are often rural residents who get their water from exempt wells. A coordinated regional effort to promote conservation could go far in increasing public awareness.

One action the County can take to promote individual water conservation is to ensure County facilities employ water efficient tools and techniques. Tracking and advertising the savings can show the public the benefits of water conservation. Examples of water conservation tools that the County could initiate include xeroscaping (using plant selection and watering techniques to promote water efficient landscapes), wastewater reuse (reusing wastewater for landscaping) or efficient irrigation (such as using drip irrigation or smart controllers).

Deschutes Basin Ecosystem

Deschutes County constitutes 26% of the Deschutes River Basin, a major watershed in Central Oregon. The Deschutes River is the major waterway draining the Basin and flows north to the Columbia River that culminates in the Pacific Ocean. Five sub-basins feed the main stem. Most of Deschutes County is contained by parts of three: the Upper Deschutes River Sub-basin, the Middle Deschutes River Sub-basin, and the Lower Crooked River Sub-basin. The remainder of the County is located in the Upper Crooked River Sub-basin and in the Goose and Summer Lakes Basin.

The Deschutes River is a vital, multi-purpose waterway that touches the lives of thousands of people along its banks and throughout Central Oregon. An important historical, economic, and cultural resource, the Deschutes provides natural beauty, abundant wildlife, and varied recreational opportunities. Most of the upper flow of the Deschutes River is through public land, although portions flow past private holdings.

Wild and Scenic Waterways

The federal Wild and Scenic Rivers Act created a program designed to protect the character of free-flowing rivers. Enacted in 1968, the Wild and Scenic Rivers Act created several categories of rivers with different levels of protection for each category. Section 7 of the Wild and Scenic Rivers Act provides minimal protection for instream flows and prohibits Federal assistance or licensing of water resource development projects within listed sections of river. Additionally, Section 7 prohibits Federal agencies from recommending any activities that will negatively affect the unique characteristics of a listed reach without adequately notifying Congress, the Secretary of Agriculture, and the Secretary of the Interior.

Individual states administer management programs for each listed reach within their boundaries, and the federal government has authorization to acquire land along each reach to maintain the character of the river (16 U.S.C. 1271-1287). However, the Wild and Scenic Rivers Act does not authorize Federal regulation of water diversions, nor does it authorize Federal acquisition of instream water rights.

Three stretches of rivers in the Upper Deschutes Basin are in the Wild and Scenic River System.

Table 2.5.1 - Wild and Scenic Rivers in Deschutes County

Waterway	Description
Upper Deschutes River	Deschutes River From Wickiup Dam to the Bend Urban Growth Boundary
Middle Deschutes River	From Odin Falls to the upper end of Lake Billy Chinook
Whychus Creek	Source to USGS Gage 14075000

Source: National Park Service

Oregon Scenic Waterways

In 1970, Oregon voters passed an initiative that created the Scenic Waterways Act, which initiated the Scenic Waterways program. The State lists waterways in order to protect their unique scenic beauty, recreation, fish, wildlife, or scientific features (OAR 736-040). The program lists waterways under six categories, each of which defines different management goals and activities to occur along and adjacent to the river.

The Oregon Parks and Recreation Department administers the Scenic Waterways program. Landowners wishing to pursue a new activity within a quarter mile of a Scenic Waterway may need to notify the Parks and Recreation Commission, and the Commission may deny this activity if it impairs the unique qualities of the waterway. Many of the listed waterways' unique qualities depend on adequate instream flows (ORS 390.835). The Scenic Waterways program prohibits new activities in a Scenic Waterway area if those activities would impair flow and if that impaired flow would harm the unique qualities of the waterway. Oregon Senate Bill 1033, passed in 1995, added groundwater pumping to these regulated activities.

Table 2.5.2 - Oregon Scenic Waterways in Deschutes County

Waterway	Description
Upper Deschutes River	From Little Lava Lake to Crane Prairie Reservoir
	From the gauging station below Wickiup Dam to General Patch Bridge
	From Harper Bridge to the COID diversion structure near river mile 171
	Robert Sawyer Park to Tumalo State Park
	From Deschutes Market Road Bridge to Lake Billy Chinook (excluding the Cline Falls hydroelectric facility near RM 145

Source: Oregon Revised Statutes 390.826

Rivers and Streams

Inventoried rivers and streams in Deschutes County are summarized below:

Table 2.5.3 - River Miles in Deschutes County

Major Rivers and Streams	Miles
Deschutes River	97
Little Deschutes River	42
Whychus Creek (lower 6-miles are in Jefferson County	39
Tumalo Creek	16
Paulina Creek	10
Fall River	8
Crooked River	7

Source: Deschutes County / City of Bend River Study (1986)

Besides rivers and creeks listed in Table 2.5.3, there are numerous perennial streams as shown in Table 2.5.4. All of these streams, except portions of Indian Ford Creek, Cache Creek and Dry Creek, are located on federal land and are subject to either the Deschutes National Forest or the Bureau of Land Management Resource Management Plans.

Table 2.5.4 - Perennial Streams in Deschutes County

• Bottle Creek	• Full Creek	• Spring Creek
• Bridge Creek	• Goose Creek	• Three Creek
• Brush Draw	• Indian Ford Creek	• SF Tumalo Creek
• Bull Creek	• Jack Creek	• NF Whychus Creek
• Cache Creek	• Kaleetan Creek	• Soda Crater Creek
• Charlton Creek	• Metolius Creek	• NF Trout Creek
• Cultus Creek	• Park Creek EF	• NF Tumalo Creek
• Cultus River	• Park Creek WF	• MF Tumalo Creek
• Deer Creek	• Pole Creek	• First Creek
• Dry Creek	• Rock Creek	• Soap Creek
• Fall Creek	• Snow Creek	• Todd Lake Creek

Source: Deschutes County/City of Bend River Study 1986

Riparian Areas

Riparian areas are areas adjacent to rivers, streams, lakes or ponds where there is vegetation that requires free or unbound water or conditions that are more moist than normal. Riparian areas form an interconnected system within a watershed. At the water's edge they define the transition zone between aquatic and terrestrial systems. Riparian areas often contain a diversity of vegetation not found in upland areas. Riparian areas are limited in Deschutes County and are important habitats for both fish and wildlife.

The Deschutes County Comprehensive Plan, adopted in 1979 and revised, mapped riparian areas along the following rivers and streams.

Table 2.5.5 - Riparian Acreage in Deschutes County

Streams	Riparian Acres
Deschutes River	1,440
Little Deschutes River	2,920
Paulina Creek	846
Indian Ford Creek	573
Tumalo Creek	50
Whychus Creek	47
Fall River	43
Crooked River	38
TOTAL	***5,966***

Source: Deschutes County/City of Bend River Study 1986

Significant riparian habitat is located in one or more of the following three areas:

- The area within 100 feet of the ordinary high water mark of an inventoried river or stream. The 100 foot wide area may contain both riparian vegetation and upland vegetation.

- Wetlands and flood plain are also frequently within 100 feet of a stream or river. In some cases the riparian vegetation may extend beyond 100 feet from the ordinary high water mark if it is a designated wetland or flood plain.
- The area adjacent to an inventoried river or stream and located within a flood plain mapped by the Federal Emergency Management Agency and zoned Flood Plain by the County. The flood plain may extend beyond 100 feet from the ordinary high water mark of the stream and may contain wetland.

The County has not conducted an inventory of riparian areas adjacent to lakes and ponds on private land. However, many of these areas are included in National Wetland Inventory Maps and are subject to County, State and/or Federal wetland fill and removal regulations. Riparian areas adjacent to the many lakes on federal lands are managed and protected under federal land and resource management plans and are not included in the County inventory.

Wetlands

Wetlands are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, under normal conditions, a prevalence of vegetation typically adapted for life in saturated soil conditions. Deschutes County Ordinance 92-045 adopted all wetlands identified on the U. S. Fish and Wildlife Service National Wetland Inventory (NWI) Maps as the Deschutes County wetland inventory. Additionally, Deschutes County Ordinance 2011-008 adopted a Local Wetland Inventory (LWI) covering 18,937 acres in South Deschutes County. These mapped wetlands are subject to County, state and federal fill and removal regulations.

The NWI Map shows an inventory of wetlands based on high-altitude aerial photos and limited field work. While the NWI can be useful for many resource management and planning purposes, its small scale, accuracy limitations, errors of omission that range up to 55 percent (existing wetlands not shown on NWI), age (1980s), and absence of property boundaries make it unsuitable for parcel-based decision making. An LWI for areas in addition to South Deschutes County would greatly improve Deschutes County's ability to conserve wetland resources, which are vital to maintaining water quality and healthy fish and wildlife populations in the Upper Deschutes basin. Fish species dependent on riparian and wetland areas in the County include: Bull Trout, Redband Trout, and Summer Steelhead.

With the exception of narrowly defined riparian buffers (100 ft from top of bank for all Class 1 and Class 2 streams), Deschutes County does not protect wetlands; instead development activities proposed in a NWI are required to initiate a land-use procedure and notify the Oregon Department of State Lands (DSL). According to the County's zoning requirements, no person shall fill or remove any material or remove any vegetation, within the bed and banks of any stream or river or in any wetland, unless approved as a conditional use or exception. All necessary state and federal permits must be obtained as condition of approval.

If jurisdictional wetlands are located in the near-stream environment, Oregon's Removal-Fill Law directs DSL to regulate removal or placement of fill in "Waters of the State." The DSL, in concert with the US Army Corps of Engineers, requires that any impacts to wetlands be mitigated so there's no 'net loss' of the resource. The Oregon Department of Fish and Wildlife (ODFW) and Department of Environmental Quality (DEQ) do not have direct permitting authority on wetland fills, but instead review and provide technical advice on wetland

applications. The DSL gives notice of the permit applications to ODFW and DEQ, among other agencies, for suggestions on reducing impacts to fish, wildlife, and water quality. However, various agencies responsible for processing permits for individual projects have limited ability to consider larger scale community needs or values. Only through an adopted Goal 5 or Goal 6 wetlands plan can a community impose its local control and direct agencies not to issue a fill permit that is contrary to its plan.

The foundation of wetland planning is the LWI, which includes a comprehensive survey and map of all wetlands in the study area, and a document compiling key information about each site. The inventory must provide sufficient information to support local wetland planning decisions, and present the information in a manner accessible to citizens. For these reasons, a set of specifications for LWI products was established as an OAR (141-086-0110 through 141-086-0240). In addition to the wetland locations and descriptions, local planners need information on what functions and values each wetland provides. This assessment of wetland qualities is conducted concurrently with, and is part of, the inventory. Replacing the NWI with an LWI (reviewed and approved by the DSL) will determine jurisdictional wetland characteristics in portions of the upper Deschutes basin. It will examine spatial information, including FEMA floodplains, aquatic soils, areas with depths to groundwater less than two feet, and riparian areas for wetland type and function.

Floodplains

Federal Emergency Management Agency Maps
The Federal Emergency Management Agency (FEMA) maps flood-plains adjacent to the following rivers and streams in Deschutes County. The floodplain along these rivers and streams is recognized in a Flood Plain zone by the County.

Table 2.5.6 - Floodplains Adjacent to Rivers and Streams

• Deschutes River	• Long Prairie
• Little Deschutes River	• Dry River
• Whychus Creek	• Spring River
• Crooked River	• Indian Ford Creek
• Paulina Creek	

Source: Deschutes County GIS

Floodplains are defined as the lowland and relatively flat areas adjoining inland waters including at a minimum, that area subject to a one percent (100-year recurrence) or greater chance of flooding in any one year. 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 local 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 (see also Section 3.5).

In 2019, Deschutes County amended the Flood Plain Zone to define split zoned properties as they exist in the Flood Plain Zone and created procedures to guide division of these split zoned properties.

In 2019, Deschutes County amended its Flood Plain Zone to incorporate additional standards from the 2014 DLCD Model Flood Ordinance.

The purpose of the Zone is to continue promoting public health, safety, and general welfare, and minimize losses due to flood conditions in specific areas. It is designed to:

(1) Protect human life and health;
(2) Minimize expenditure of public money and costly flood control projects;
(3) Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
(4) Minimize prolonged business interruptions;
(5) Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets, and bridges located in areas of special flood hazard;
(6) Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;
(7) Ensure that potential buyers are notified that property is in an area of special flood hazard; and,
(8) Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

The Zone also provides riparian area conservation along inventoried rivers and streams for fish and wildlife and preservation of significant scenic and natural resources. Comprehensive plan policies for Water Resources (Section 2.5), Wildlife Resources (Section 2.6), Open Space and Scenic Views and Sites Resources (Section 2.7), and the corresponding development standards in Title 18 implement protections pertaining to Goal 5.

Instream Water Rights

Oregon was one of the first states to acknowledge that instream uses were beneficial and create a framework for instream flow protection. Instream flows are those required to maintain ecosytem or other public needs. In 1987 the Oregon Legislature passed the Instream Water Rights Act and created the statutory framework necessary to establish instream water rights. OWRD holds these rights in trust for the public, but they can be purchased, leased, or gifted to the state by anyone (OAR 690-077). The rights are intended to provide public benefits such as fisheries enhancement, pollution abatement or recreation. OWRD regulates instream rights in the same manner that they regulate traditional water rights. Instream flow rights may not injure other water rights holders, cause the enlargement of a water right, and exceed the flows necessary to increase public benefits (OAR 690-077).

Establishing New Instream Water Rights

The majority of instream water rights held by the state of Oregon are junior water rights. These junior rights are not often met during the summer irrigation season. Three state agencies can apply for new instream water rights. The Department of Environmental Quality

(DEQ), Department of Fish and Wildlife (ODFW) or Parks and Recreation Department (OPRD) can determine that instream flow rights are not adequate to provide specified public benefits and can apply to OWRD for additional instream flow rights (ORS 537.336). In general, instream water rights cannot exceed the estimated average natural flow of a stream.

Establishing Senior Instream Water Rights

Three techniques in OAR 690 allow individuals or agencies to create senior instream water rights. First, individuals or organizations can lease an existing water right for instream use. Individuals may lease all or part of their water right for instream use during all or part of the year (OAR 690-077). In the Deschutes Basin, the majority of leased water comes from irrigation districts and their customers. Water rights created through instream leases have the same priority date as the original water right. Leasing water instream provides a flexible, low-cost technique for improving instream flows, but it does not permanently protect water instream.

Second, water right holders may permanently transfer existing water rights instream (OAR 690-077). Permanent water transfers allow individuals to transfer water off of their land while improving instream flows in the basin. They are often associated with a change in the character of the land from agriculture to other uses. As with temporary transfers, instream water rights created through permanent transfers have the same priority date as the originating water right that was transferred instream.

Oregon's Conserved Water program provides a third technique for creating senior instream water rights (OAR 690-018). This program is relatively unique within western water law. Oregon adopted its Conserved Water rules in 1987 to encourage water conservation and to promote local cooperation in instream flow improvement. To be eligible for the Conserved Water program, a water rights holder needs to satisfy the use listed on their permit with less water than they have the right and ability to divert. Water rights holders who implement water conservation projects can lease, sell, or transfer a portion of their conserved water. At least 25% of the conserved water goes to the state, which transfers the water instream.

The water rights holder receives a proportion of the remaining conserved water that depends on project funding. The proportion depends upon on what percentage of the Conserved Water project is funded through public sources and on any special agreements that financing partners have made with the water rights holder. Unless otherwise agreed upon, the water rights holder usually receives between 25% and 75% of the total conserved water. Instream water rights created through the conserved water program usually have the same priority date as the originating water right. The three techniques, leasing, transfers and conserved water can be used to place existing junior or senior water rights instream.

Instream Flows

Increasing the water flow on rivers and streams is important because low flows raise water temperatures which provides inhospitable habitat for fish and aquatic life.

Irrigation

Stream flows in most of the upper Deschutes River Basin are controlled by the influence of reservoir regulation and irrigation diversions near Bend. Storage reservoirs were constructed by the irrigators for the purpose of storing water from the river during the non-irrigation

season to serve as a supplement to the natural flow of the river during the irrigation season. Three reservoirs, Crane Prairie, Crescent Lake, and Wickiup were constructed by the Bureau of Reclamation in the 1920s and 1940s, financed by loans secured and repaid by the irrigation districts. The three reservoirs have a combined storage capacity of 347,550 acre-feet. Seven irrigation districts distribute water to productive parts of the County, however not all of these districts irrigate land completely within it. Summer release from the reservoirs provide instream benefits for wildlife, navigation, and water quality. Recreational use at many of the projects is also significant.

Nearly 90% of the streamflow from the Deschutes River in Bend is diverted through irrigation canals during the irrigation season which typically runs from April through October. During the summer months, the diversions cause a dramatic reduction of streamflow in the middle Deschutes sub-basin. The porous, volcanic soil characteristic of this region causes as much as 50% of the water that is diverted from the river in irrigation canals to seep into the ground before it reaches the farm. As a result, irrigation districts need to divert twice the amount of water they need to serve their patrons. These seasonal flow disruptions have contributed to a decline in the overall health of rivers and streams including degraded fish habitat and poor water quality.

Fisheries and water quality drive instream flow restoration in the Upper Basin. The reaches historically supported salmon and trout populations. Anadromous (fish that migrate between fresh and salt water) salmon re-introduction efforts have drawn attention to water quantity issues in the basin. Prior to current restoration efforts, sections of Whychus Creek and Tumalo Creek typically dried up during the irrigation season due to extensive diversion.

Voluntary, market-based approaches, enabled by statutory law, provide the greatest opportunity for restoring instream flows in the Deschutes Basin. Tools available include instream transfers, leases, storage leases and allocation of conserved water. The Deschutes River Conservancy, local irrigation districts and state and federal partners are working together to restore water to reaches by using these tools.

Federal and state regulatory approaches also have the potential to affect instream flow allocation. Federal approaches include the Wild and Scenic Rivers Act, the Clean Water Act, and the Endangered Species Act. State approaches include the State Scenic Waterways Act and instream flow rights to support aquatic life.

Fish and Aquatic Habitat

A discussion in the Wildlife section highlights the economic benefits that fishing generates for Deschutes County. Protecting and enhancing local fish habitat can ensure those benefits continue.

Naturally spawning populations of native rainbow trout and whitefish along with introduced populations of rainbow, brown and brook trout and kokanee salmon are present in streams and reservoirs. Most natural lakes were historically barren of fish populations but today nearly all suitable lakes are stocked annually with fingerling or legal sized rainbow, brook, brown and cutthroat trout and kokanee, coho and Atlantic salmon. Lake trout have been introduced into Big Cultus Lake and have established a natural producing population. Most lakes do not provide suitable spawning habitat and populations can only be maintained by continued stocking. It is

important to sustain the naturally reproducing populations and to balance stocking programs with the proper habitats.

Federal Endangered Species Act

As discussed in the Wildlife section of this Plan, species identified as threatened or endangered by the National Oceanic Atmospheric Administration (NOAA) Fisheries or the U.S. Fish and Wildlife Service (USFWS) are offered some protections under the Endangered Species Act (ESA). The act prohibits federal actions that jeopardize listed species and private actions that result in a "taking" of listed species. The ESA protects threatened or endangered populations or habitat of listed salmon and trout in the Deschutes Basin.

The Deschutes River and its tributaries provide spawning habitat for several populations of ESA listed fish. Both wild summer steelhead and bull trout are currently listed as threatened under the ESA. Historically, these two species thrived throughout the Basin. However, flow modification and habitat degradation have reduced available spawning habitat and limited population sizes. Steelhead trout were historically present in waterways within Deschutes County, including portions of the Deschutes River, Crooked River, and Whychus Creek. Historically, bull trout were found throughout the Deschutes River, the Little Deschutes River, and the Lower Crooked. In Deschutes County, documented bull trout have been found in the Middle Deschutes, but no documented spawning has occurred.

Bull Trout

Bull trout are currently listed as threatened under the Federal ESA in the Deschutes River Basin. Bull trout are a cold-water fish of relatively pristine stream and lake habitat in the Pacific Northwest. They have specific habitat requirements, including the "Four C's": Cold, Clean, Complex, and Connected habitat. Bull trout require the coldest water temperatures of any northwest salmonid; they require the cleanest stream substrates for spawning and rearing; they require complex habitats, including streams with riffles and deep pools, undercut banks and lots of large logs; and they need migratory routes from main river, lake, and even ocean habitats to headwater streams for annual spawning and feeding migrations. Critical habitat for Bull Trout is located north of Lower Bridge Road below Big Falls on Bureau of Land Management land.

Steelhead Trout

The construction of the Pelton Round Butte dam complex west of Madras in 1964 blocked the migration of salmon and steelhead to the ocean. In 2005 a re-licensing agreement for the Pelton Round Butte hydroelectric project included the establishment of the Pelton Round Butte Fund. The fund is intended to support resource protection measures to mitigate project-related impacts, including those that enhance and improve wetlands, riparian and riverine habitats, and riparian, aquatic and terrestrial species connectivity.

The multi-organization agreement for relicensing Pelton Round Butte lays out a comprehensive fish passage program that includes a solution to assist in juvenile fish collection and passage efforts over the project's three dams. The plan facilitates the return of spring Chinook and sockeye salmon to the Metolius River and steelhead to the Crooked River (to Bowman Dam) and the Deschutes River (Big Falls north of Lower Bridge Road). As part of the plan, 200,000 steelhead fry were released into Whychus Creek in 2007. It is difficult to estimate when the

fish will return to Whychus Creek as adults ready to spawn and restore the natural cycle to the stream, but it is estimated to be three to five years.

ESA and Deschutes County

The ESA requires the appropriate federal agency, NOAA or USFWS, to issue regulations as deemed necessary and advisable to provide for the conservation of the species. Deschutes County is evaluating whether its local government policies and practices are sufficiently protective of steelhead trout and their habitat. Specifically, Deschutes County desires to avoid a "take" of reintroduced steelhead trout, and reduce the potential of ESA-related enforcement actions and third-party lawsuits. The County does not authorize or participate in high-risk activities, such as water diversions, so there is minimal risk that the County's activities could directly cause steelhead trout mortality. The County's practices, however, can indirectly affect steelhead trout through changes in riparian habitat, floodplain function, erosion control, or other practices that could negatively impact steelhead populations or habitat.

It is important to note that reintroduced steelhead trout are blocked from upstream movement to the Upper Deschutes River at Big Falls, approximately 30 miles downstream from Bend. As a consequence, there is minimal risk that the County's activities in areas along the Deschutes River or its tributaries above Big Falls could have a direct impact on steelhead trout populations or aquatic habitat. The County's practices, however, can indirectly affect steelhead trout in the Deschutes River downstream of Big Falls through changes in water quality. Loss of riparian shade through the application of County policies, for example, could increase water temperatures in downstream portions of the Deschutes River.

The irrigation districts in the region, along with other local governments at a greater risk of steelhead take, are preparing a Habitat Conservation Plan (HCP) to address the risks posed to steelhead. An HCP is a five to six year process undertaken by entities whose otherwise lawful activities are at risk of resulting in an accidental take. The plan outlines potential impacts these activities pose to the ESA-listed species and identifies specific steps taken to minimize and mitigate accidental take. If the plan is approved by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service, the entity is permitted to proceed with their activities, provided the terms and conditions identified in the HCP are followed. The local HCP process relating to steelhead was initiated in 2008 and expected to be completed by 2014.

Through a risk assessment conducted in 2008-2009, it was determined that the potential risk posed by Deschutes County governmental activities was minimal and did not require County participation in the HCP. The risk assessment also provided recommendations for the County to minimize exposure to a "take". Many of these recommendations to land use and stormwater have been incorporated throughout this Comprehensive Plan.

Deschutes River Mitigation and Enhancement Program

The Deschutes River Mitigation and Enhancement Program was created in 1991 as a result of a Central Oregon Irrigation District (COID) Hydroelectric Project (FERC License Application No. 3571) and Conditional Use Permit 87-2. The program helps achieve ODFW habitat and management goals and objectives within the Upper Deschutes River sub-basin, consistent with the COID/ODFW agreement. A condition of both the FERC license and conditional use permit is that COID will provide ODFW with funds to develop and implement a fish and wildlife habitat mitigation and enhancement program for the Upper Deschutes River Basin. On

October 7, 2008 the Deschutes River Mitigation and Enhancement Committee adopted an Upper Deschutes River Restoration Strategy developed jointly by ODFW, Upper Deschutes Watershed Council and the Deschutes River Conservancy.

Upper Deschutes River Restoration Strategy

The Upper Deschutes River Restoration Strategy (the Strategy) outlines necessary steps to restore the structure and function of the Deschutes River between Wickiup Reservoir and North Canal Dam. Activities have been identified to help achieve a restoration vision for the upper Deschutes River and a clear set of actions and recognizable outcomes that will be necessary for success.

Flows in the upper Deschutes River were remarkably stable under natural conditions. Irrigation storage in Wickiup and Crane Prairie Reservoirs now largely dewater this reach between October and April and artificially increase flow in the reach during the late spring, summer, and early fall. The shift from a naturally stable flow pattern to a highly variable one has limited fish populations in the Deschutes River. The 2004 Deschutes Sub-basin Plan identified that "stream flow extremes, especially low or intermittent flows, are probably the most significant factors limiting fish production in much of the Deschutes River sub-basin (sic) today." The ODFW identifies improving redband trout and whitefish populations and determining the feasibility of re-introducing bull trout as goals for the upper Deschutes River.

Restoration Strategy Elements and Recommended Actions

As stated earlier, streamflow is the greatest limiting factor in the upper Deschutes River. Streamflow restoration and related actions have the greatest potential for improving ecological conditions in the long-term. However, improving intra- and inter-annual flow patterns alone will not be sufficient to achieve the restoration vision. There is a need for strategically determined, short-term, local scale habitat enhancement and long-term, reach scale channel reconstruction to complement streamflow restoration in the upper Deschutes River. Comprehensive restoration monitoring will help to document current status and trends while improving actions in the future. There is also a need for a research program to document emerging issues in the upper Deschutes River, including water quality issues related to plant growth and nutrient inputs. The high priority recommendations are summarized below.

<u>High Priority Actions</u>

- Identify the desired dimension, pattern, and profile of the upper Deschutes River.
- Identify target hydrograph and benchmarks.
- Restore individual components of the hydrograph through temporary and permanent water transactions.
- Identify high-value, at-risk riparian areas.
- Establish a comprehensive monitoring plan.
- Support community organizing and information sharing.
- Establish a research program to study emerging water quality issues.

Groundwater Quality

Generally, groundwater quality in Deschutes County is generally classified as being 'good,' providing 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 Department of Environmental Quality (DEQ) Laboratory and Water Quality Divisions' *Groundwater Quality Report for the Deschutes Basin* (March 2006) identifies areas of concern for groundwater contamination based on various sources of data and groundwater quality studies. Based on collected data, development patterns and the geology of the underlying aquifer, the report makes recommendations for a couple of areas in the County. The report notes the groundwater aquifer in the Redmond area is vulnerable to contamination from human activities and recommends further study by the DEQ. The La Pine aquifer in the southern portion of the county from the Sunriver area to the Klamath County line between Newberry Caldera and the Cascades is an area of particular concern because of data collected through several studies and the high level of development in the area. The report also identifies underground injection systems that could contaminate the aquifer with pollutants from stormwater drywells or sewage drillholes.

In South Deschutes County, the concern for groundwater quality arises from nitrate contamination associated with on-site wastewater treatment (septic) systems discharging to 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.

Considerable work has gone into studying the groundwater in South County. In 1999 Deschutes County and the Department of Environmental Quality (DEQ) identified the need for a better understanding of the processes that affect the movement and chemistry of nitrogen in the aquifer underlying the La Pine area. In response, the U.S. Geological Service (USGS), in cooperation with Deschutes County and DEQ, began a study to examine the hydrologic and chemical processes that affect the movement and chemical transformation of nitrogen within the aquifer. A primary objective was to provide tools for evaluating the effects of existing and future residential development on water quality and to develop strategies for managing groundwater quality.

Field research from the USGS study shows that in a 250-square-mile study area near La Pine the groundwater underlying the La Pine sub-basin is highly vulnerable and being polluted by continued reliance on traditional onsite systems. Environmental impacts from residential development include higher nitrate concentrations in groundwater that is tapped for domestic water supply and discharges to rivers. Nitrates are regulated by the federal Environmental Protection Agency and DEQ as a human health concern. Vulnerability of the shallow aquifer to contamination led to concern that wastewater from septic systems poses a threat to the primary drinking water supply and local river systems. The Upper Deschutes and Little Deschutes Sub-basins have abundant, natural sources of phosphorus from volcanic soils and rocks so the rivers are naturally nitrogen limited. Nitrogen-limited rivers are sensitive to low concentrations of available nitrogen until some other component becomes limiting, and that may lead to ecological impacts.

In 2008 the County used the research on nitrates to adopt a 'local rule' that required South County residents to convert their septic systems over a period of 14 years to alternative sewage system technology designed to reduce nitrates. New septic systems were also required

to use alternative technologies. The County created a process to assist residents in funding the conversions.

Many South County residents expressed concern over the costs involved with converting their septic systems and disputed the science behind the rule. Placed on the ballet by petition, the local rule was rescinded by voters in March 2009.

As of 2010 the DEQ is leading the effort to address nitrates in South County, with the full cooperation of the County. One solution being considered is creating a sewer system or extending Sunriver's to serve some of the nearby areas. Sewer systems are tightly restricted on rural lands by Statewide Planning Goal 11 and OAR 660-11, so the Department of Land Conservation and Development is also involved in these efforts.

Surface Water Quality

The federal Clean Water Act 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) that are 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.

Compliance with Land Use Requirements

It is helpful to coordinate TMDL implementation with local land use plans, such as this Comprehensive Plan. That will ensure maximum coordination in addressing water quality issues. To provide evidence that a TMDL implementation plan is in compliance with local land use requirements, in most cases the plan should:

- Identify applicable acknowledged local comprehensive plan provisions and land use regulations, and
- Explain how the implementation plan is consistent with local planning requirements or what steps will be taken to make the local planning requirements consistent with it.

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

Tributaries

- Indian Ford Creek
- Tumalo Creek
- Whychus Creek

Lakes

- Lava Lake

Water and Land Use

There are some water issues that can be managed through County Codes, such as wellhead protection or stormwater ordinances.

Water Management Plans

Water Management Plans can be useful tools for understanding water use for large projects. Setting goals for water use, determining how much water will be needed, assessing options such as the reuse of graywater for landscaping and ensuring implementation of the plan can go a long way towards efficient use of water in new development. Water Management Plans would not be needed for single family homes or other small projects.

Well Head Protection

Wellhead protection (WHP) is a plan designed to protect groundwater resources of Public Water Systems (PWS) from contamination. A community's source of drinking water is an extremely important resource, contributing to both the human and economic health of the area. WHP involves determining the area around the well most susceptible to contamination, inventorying potential contaminant sources and implementing management strategies to reduce the risk associated with those sources. WHP is an investment in the future.

In Oregon it is recommended that an area large enough to encompass 10 years of groundwater travel time be delineated so that if the aquifer becomes contaminated upgradient, there will be sufficient time to devise a plan to deal with the contamination. Delineations as described may extend in excess of several thousand feet away from a wellhead. Currently Deschutes County does not have a wellhead protection plan.

Stormwater

In 2005 the cities and counties of Central Oregon joined forces to protect local water resources from polluted urban runoff, manage urban flooding, and meet new state and federal regulatory requirements by developing comprehensive stormwater management guidance for the region. This new partnership provides opportunities to work more efficiently and effectively and provide consistency and clout for the region.

The first major project the partnership undertook was the development of a regional stormwater management manual. The Central Oregon Stormwater Manual provides stormwater guidance for each participating jurisdiction. It was funded primarily through jurisdictional contributions, and was coordinated by a committee of participating cities, counties and the Central Oregon Intergovernmental Council.

Central Oregon Stormwater Management Project

The Central Oregon Stormwater Manual adopts best available stormwater management guidance from Oregon and Eastern Washington to create a reference for engineers, builders,

and local government staff on the design and construction of runoff treatment and flow control facilities. The Best Management Practices (BMPs) that make up the core of the Manual are intended to comply with all federal and state regulations. They are suitable to the unique climatic and hydro-geologic conditions of the region, and will protect both water quality and natural runoff patterns. In contrast to historic practices, non-underground injection methods of managing stormwater are encouraged and pre-treatment required for water injected underground.

Section 2.5 Water Resource Policies

Goals and Policies

Water Coordination, Availability and Conservation

Goal 1 **Develop regional, comprehensive water management policies that balance the diverse needs of water users and recognize Oregon water law.**

Policy 2.5.1 Participate in Statewide and regional water planning including:

a. Work cooperatively with stakeholders, such as the Oregon Water Resources Department, the Deschutes Water Alliance and other non-profit water organizations;
b. Support the creation and continual updating of a regional water management plan.

Policy 2.5.2 Support grants for water system infrastructure improvements, upgrades or expansions.

Policy 2.5.3 Goal 5 inventories, ESEEs and programs are retained and not repealed.

Goal 2 **Increase water conservation efforts.**

Policy 2.5.4 Promote efficient water use through targeted conservation, educational and, as needed, regulatory or incentive programs.

a. Review County Code and revise as needed to ensure new development incorporates recognized efficient water use practices for all water uses.
b. Encourage the reuse of grey water for landscaping.

Policy 2.5.5 Promote a coordinated regional water conservation effort that includes increasing public awareness of water conservation tools and practices.

Policy 2.5.6 Support conservation efforts by irrigation districts, including programs to provide incentives for water conservation.

River and Riparian Ecosystems and Wetlands

Goal 3 **Maintain and enhance a healthy ecosystem in the Deschutes River Basin.**

Policy 2.5.7 The County shall notify the Oregon Division of State Lands and the Oregon Department of Fish and Wildlife of any development applications for land within a wetland identified on the National Wetland Inventory or South Deschutes County Local Wetland Inventory maps.

Policy 2.5.8 Work with stakeholders to restore, maintain and/or enhance healthy river and riparian ecosystems and wetlands, including the following:

a. Encourage efforts to address fluctuating water levels in the Deschutes River system;
b. Cooperate to improve surface waters, especially those designated water quality impaired under the federal Clean Water Act;

c. Support research on methods to restore, maintain and enhance river and riparian ecosystems and wetlands;
d. Support restoration efforts for river and riparian ecosystems and wetlands;
e. Inventory and consider protections for cold water springs;
f. Evaluate waterways for possible designation under the Scenic Waterways program;
g. In collaboration with stakeholders, map channel migration zones and identify effective protections;
h. Develop comprehensive riparian management or mitigation practices that enhance ecosystems, such as vegetation removal criteria.

Policy 2.5.9 Support studies on the Deschutes River ecosystem and incorporate watershed studies that provide new scientific information on the Deschutes River ecosystem, such as the 2010 Local Wetland Inventory adopted in Ordinance 2011-008.

Policy 2.5.10 Support educational efforts and identify areas where the County could provide information on the Deschutes River ecosystem, including rivers, riparian areas, floodplains and wetlands.
a. Explore methods of ensuring property owners know and understand regulations for rivers, riparian areas, floodplains and wetlands.

Policy 2.5.11 Support the high priority actions from the Deschutes River Mitigation and Enhancement Committee's 2008 Upper Deschutes River Restoration Strategy.

Goal 4 Maintain and enhance fish populations and riparian habitat.

Policy 2.5.12 Coordinate with stakeholders to protect and enhance fish and wildlife habitat in river and riparian habitats and wetlands.

Policy 2.5.13 Promote healthy fish populations through incentives and education.

Policy 2.5.14 Support healthy native fish populations through coordination with stakeholders who provide fish habitat management and restoration.
a. Review, and apply where appropriate, strategies for protecting fish and fish habitat.
b. Promote salmon recovery through voluntary incentives and encouraging appropriate species management and habitat restoration.

Policy 2.5.15 Review Habitat Conservation Plans for species listed under the Endangered Species Act, to identify appropriate new policies or codes.
a. Spawning areas for trout should be considered significant habitat and should be protected in rivers and streams.
b. Cooperate with irrigation districts in preserving spawning areas for trout, where feasible.

Policy 2.5.16 Use a combination of incentives and/or regulations to mitigate development impacts on river and riparian ecosystems and wetlands.

Groundwater and Surface Water Quality

Goal 5 Protect and improve water quality in the Deschutes River Basin.

Policy 2.5.17 Support plans, cooperative agreements, education, water quality monitoring and other tools that protect watersheds, reduce erosion and runoff, protect the natural water systems/processes that filter and/or clean water and preserve water quality.

Policy 2.5.18 Coordinate with the Oregon Department of Environmental Quality and other stakeholders on regional water quality maintenance and improvement efforts such as identifying and abating point and non-point pollution or developing and implementing Total Maximum Daily Load and Water Quality Management Plans.

Policy 2.5.19 Coordinate with stakeholders to address water-related public health issues.

a. Support amendments to State regulations to permit centralized sewer systems in areas with high levels of existing or potential development or identified water quality concerns.
b. If a public health hazard is declared in rural Deschutes County, expedite actions such as legislative amendments allowing sewers or similar infrastructure.

Policy 2.5.20 Work with the community to expand the range of tools available to protect groundwater quality by reviewing new technologies, including tools to improve the quality and reduce the quantity of rural and agricultural stormwater runoff.

Policy 2.5.21 Explore adopting new ordinances, such as a wellhead protection ordinance for public water systems, in accordance with applicable Federal and/or State requirements.

Land Use and Water Policy

Goal 6 Coordinate land use and water policies.

Policy 2.5.22 Coordinate with other affected agencies when a land use or development application may impact river or riparian ecosystems or wetlands.

Policy 2.5.23 Encourage land use patterns and practices that preserve the integrity of the natural hydrologic system and recognize the relationship between ground and surface water.

Policy 2.5.24 Ensure water impacts are reviewed and, if necessary, addressed for significant land uses or developments.

Policy 2.5.25 Evaluate methods of modeling the cumulative impacts of new land uses or developments on water quality and quantity.

Policy 2.5.26 Explore an intergovernmental agreement with the irrigation districts for ensuring irrigated land partitions and lot line adjustments are not approved without notice to and comment by the affected district.

Policy 2.5.27 Explore incorporating appropriate stormwater management practices into Deschutes County Code.

Policy 2.5.28 Support wastewater facilities and improvements where warranted.

Policy 2.5.29 Support regulations, education programs and cleaning procedures at public and private boat landings.

Policy 2.5.30 Consider adopting regulations for dock construction based on recommendations of the Oregon Department of Fish and Wildlife and the Deschutes River Mitigation and Enhancement Program.

Section 2.6 Wildlife

Background

Wildlife diversity is a major attraction of Deschutes County. It was mentioned in many Comprehensive Plan meetings in 2008 and 2009 as important to the community. Healthy wildlife populations are often a sign of a healthy environment for humans as well as other species. The key to protecting wildlife is protecting the habitats each species needs for food, water, shelter and reproduction. Also important is retaining or enhancing connectivity between habitats, in order to protect migration routes and avoid isolated populations.

Wildlife is tied to land use planning because human development impacts habitats in complex ways. Wildlife protections are provided by federal, state and local governments. Oregon land use planning protects wildlife with Statewide Planning Goal 5, Open Spaces, Scenic and Historical Areas and Natural Resources and the associated Oregon Administrative Rule (OAR) 660-023 (this Rule replaced 660-016 in 1996). Statewide Goal 5 includes a list of resources which each local government must inventory, including wildlife habitat.

The process requires local governments to inventory wildlife habitat and determine which items on the inventory are significant. For sites identified as significant, an Economic, Social, Environmental and Energy (ESEE) analysis is required. The analysis leads to one of three choices: preserve the resource, allow proposed uses that conflict with the resource or strike a balance between the resource and the conflicting uses. A program must be provided to protect the resources as determined by the ESEE analysis.

In considering wildlife habitat, counties rely on the expertise of the Oregon Department of Fish and Wildlife (ODFW) and U.S. Fish and Wildlife Service (USFWS). Those agencies provide information for the required wildlife inventory and recommendations on how to protect wildlife habitat on private lands. Note that this section focuses on wildlife, while fish are covered in the Water Resources section of this Plan.

Wildlife Designations

Comprehensive Planning for Wildlife

Plan 2000, the Comprehensive Plan adopted in 1979, included a Fish and Wildlife Chapter with policies aimed at protecting wildlife. That Plan also noted the controversial nature of wildlife protections. To implement the Plan policies, the Wildlife Area Combining Zone was adopted. This overlay zone was intended to protect identified big game habitat through zoning tools such as appropriate lot sizes and setbacks. In 1986 a River Study was completed and adopted into the Resource Element. Goals and policies from that study, including wildlife goals, were added to Plan 2000.

As part of State mandated Periodic Review, the County took another look at wildlife protections to further comply with the requirements of Goal 5 and the then prevailing OAR 660-16. The County worked with the ODFW to obtain the most recent inventory information on fish and wildlife resources in the county and to identify uses conflicting with those resources. This information was used to update the inventories and amend the ESEE analyses.

In addition, ODFW provided information to support zoning ordinance provisions to resolve conflicts between fish and wildlife resource protection and development. The County adopted a Sensitive Bird and Mammal Combining Zone which identified and protected specific bird nests or leks and bat hibernating or nursery sites.

Ordinances for Compliance with Goal 5

During periodic review in 1992, Deschutes County met the requirements of Goal 5 by:

- The adoption of Goals and Policies in Ordinance 92-040 reflecting Goal 5 requirements, including a Sensitive Bird and Mammal Combining Zone to identify and protect specific bird nests or leks and bat hibernating or nursery sites;
- The adoption of Ordinance 92-041 amended the comprehensive plan to inventory each Goal 5 resource, analyze conflicting uses, and analyze the ESEE consequences of protecting or not protecting inventoried fish and wildlife resources;
- The adoption of zoning ordinance provisions in Ordinance 92-042, as applied to inventoried sites by the map adopted by Ordinance 92-046.

In 2015, the Land Conservation and Development Commission (LCDC) adopted rules to Oregon Administrative Rule (OAR) chapter 660, division 23, to establish procedures for considering development proposals on lands identified as Greater Sage-Grouse Area Habitat. Deschutes County met the requirements by:

- Adopting the 2015 Goal 5 Greater Sage Grouse habitat Area Inventory Map into its Comprehensive Plan and amending the Sensitive Bird and Mammal Habitat Inventory to remove 1990 sage grouse lek and range data by Ordinance 2015-010 (Those maps are incorporated by reference herein); and,
- Adopting sage grouse regulations as a Greater Sage Grouse Area Combining Zone by Ordinance 2015-011.

Wildlife Snapshot 2008-2009

Source: County GIS data

- There are 816,649 acres in Deschutes County's Wildlife Area Combining Zone.
- There are 40 sites protected by the Sensitive Bird and Mammal Habitat Combining Zone.
- 76% of County land is owned and managed by the Federal government through the U.S. Forest Service and Bureau of Land Management.

Source: Fishing, Hunting, Wildlife Viewing, and Shellfishing in Oregon, 2008 May 2009 Prepared for Oregon Department of Fish and Wildlife by Dean Runyan Associates

- Nearly $70 million was spent in Deschutes County on travel generated expenditures on wildlife viewing, fishing and hunting by people from over 50 miles away.
- Over 60% of the $70 million noted above was spent for wildlife viewing, with fishing second with nearly 30% and nearly 10% on hunting.
- Over $8 million in revenue from fishing, hunting and wildlife viewing came from people who live in the County or within 50 miles of the County.
- Over 60% of the $8 million noted above was spent on fishing, over 20% was spent on hunting and under 20% was spent on wildlife viewing.
- All total, over $78 million was spent in Deschutes County on fishing, hunting and wildlife viewing.

Deer Migration Corridor

The Bend/La Pine migration corridor is approximately 56 miles long and 3 to 4 miles wide and parallels the Deschutes and Little Deschutes Rivers. The corridor is used by deer migrating from summer range in the forest along the east slope of the Cascades to the North Paulina deer winter range. Deschutes County adopted a "Deer Migration Priority Area" based on a 1999 ODFW map submitted to the South County Regional Problem Solving Group. This specific sub-area is precluded from destination resorts.

Deer Winter Range

The ODFW identified the Metolius, Tumalo and North Paulina deer winter ranges during Deschutes County's initial comprehensive plan. The boundaries of these winter ranges are shown on the Big Game Sensitive Area map in the 1978 Comprehensive Plan and have been zoned with the Wildlife Combining Zone since 1979. The winter ranges support a population of approximately 15,000 deer.

In 1992, ODFW recommended deer winter range in the northeast corner of the county, in the Smith Rock State Park area, be included in the Deschutes County inventory and protected with the same measures applied to other deer winter range. This area was officially included and mapped on the Wildlife Combining Map when Ordinance 92-040 was adopted by the Board of County Commissioners.

Elk Habitat

The Land and Resource Management Plan for the Deschutes National Forest identifies 6 key elk habitat areas in Deschutes County. The ODFW also recognizes these areas as critical elk habitat for calving, winter or summer range. The following areas are mapped on the Big Game Habitat Area map and in the Deschutes National Forest Land and Resource Management Plan:

- Tumalo Mountain
- Kiwa
- Ryan
- Crane Prairie
- Fall River
- Clover Meadow

Antelope Habitat

The Bend and Ochoco District offices of the ODFW provided maps of the antelope range and winter range. The available information is adequate to indicate that the resource is significant. The antelope habitat is mapped on Deschutes County's Big Game Habitat-Wildlife Area Combining Zone Map.

Sensitive Birds

Nest sites for the northern bald eagle, osprey, golden eagle, prairie falcon, great grey owl, and great blue heron rookeries are inventoried in Ordinance No. 92-041. The area required for each nest site varies between species. The minimum area required for protection of nest sites has been identified by the ODFW in their management guidelines for protecting colony nesting birds, osprey, eagles and raptor nests.

Federal and State Wildlife Protections

Federal Protections

The primary federal protection for wildlife is the Endangered Species Act (ESA), which sets the preservation of biodiversity as its highest priority. Under ESA, National Oceanic Atmospheric Administration (NOAA) Fisheries or the U.S. Fish and Wildlife Service (USFWS) list species as threatened or endangered. ESA prohibits both federal actions that jeopardize listed species and private actions that result in the "taking" of listed species. Court rulings have explicitly determined that habitat modification can lead to a "taking," even if the modification does not affect a specific individual member of the species. ESA authorizes civil and criminal suits be brought against entities that violate its substantive or procedural provisions.

There are two fish species and one bird species listed as federally threatened or endangered in Deschutes County. Fish are discussed under the Water Resources section of this chapter and the bird, the Northern Spotted Owl, has not been found on private lands.

State Protections

It is Oregon's policy "to prevent the serious depletion of any indigenous species" (ORS 496.012). The Oregon Department of Fish and Wildlife maintains a list of fish and wildlife species determined to be either threatened or endangered according to OAR 635. When a species population is seriously depleted, recovery can be difficult and expensive as well as socially and economically divisive. To provide a positive approach to species conservation, a "sensitive" species classification was created under Oregon's Sensitive Specie Rule (OAR 635-100-040). Table 2.7.1 lists species in Deschutes County that are listed by either federal or state wildlife agencies under the above mentioned laws.

Besides the listings of endangered or threatened, species can be federally listed as candidate species or species of concern. State listings include threatened, critical and vulnerable. Each status has a definition specifying different actions.

Table2.6.1- Special Status of Select Mammals, Birds, Amphibians, and Reptiles in Deschutes County 2009

Species	*State Status*	*Federal Status*
Mammals		
California Wolverine	Threatened	Species of Concern
Fisher	Critical	--
Fringed Myotis	Vulnerable	--
Long-eared Myotis	--	Species of Concern
Long-legged Myotis	Vulnerable	Species of Concern
Pallid Bat	Vulnerable	--
Preble's Shrew	--	Species of Concern
Pygmy Rabbit	Vulnerable	Species of Concern
Silver-haried bat	Vulnerable	Species of Concern
Small-footed Myotis	--	Species of Concern
Spotted bat	Vulnerable	--
Townsends western big-eared bat	Critical	Species of Concern
Yuma Myotis	--	Species of Concern
Birds		
American Peregrine Falcon	Vulnerable	Delisted
Bald Eagle	Threatened	Delisted
Black Tern	--	Species of Concern
Black-backed Woodpecker	Vulnerable	--
Ferruginous Hawk	Vulnerable	Species of Concern
Flammulated Owl	Vulnerable	--
Great Gray Owl	Vulnerable	--
Greater Sage Grouse	Vulnerable	Species of Concern
Lewis' Woodpecker	Critical	Species of Concern
Loggerhead Shrike	Vulnerable	--
Long-billed Curlew	Vulnerable	--
Mountain Quail	Vulnerable	Species of Concern
Northern Goshawk	Vulnerable	Species of Concern
Northern Spotted Owl	Threatened	Threatened
Olive-sided Flycatcher	Vulnerable	Species of Concern
Pileated Woodpecker	Vulnerable	--
Swainson's Hawk	Vulnerable	--
Western Burrowing Owl	Vulnerable*	Species of Concern
White-head Woodpecker	Critical	Species of Concern
Willow Flycatcher	Vulnerable	Species of Concern
Yellow-breasted chat	--	Species of Concern
Yellow-billed cuckoo	Vulnerable	Candidate
Amphibians and Reptiles		
Cascades Frog	Vulnerable	Species of Concern
Coastal tailed frog	Vulnerable	Species of Concern
Northern Sagebrush Lizard	--	Species of Concern
Oregon slender salamander	Vulnerable	Species of Concern
Oregon Spotted Frog	Critical	Candidate
Western Pond Turtle	Critical	--
Western Toad	Vulnerable	--
* listed only for the Basin and Range Ecoregion		

Source: 2009 Interagency Report and ODFW

Oregon Department of Fish and Wildlife

Oregon Conservation Strategy

In 2006 the Oregon Conservation Strategy (OCS) was adopted by Oregon's Fish and Wildlife Commission for the state of Oregon. Wildlife and habitat issues are often crisis-driven and focused on individual species. The OSC is intended to provide a long-term, big-picture look, using the best available science, on how best to maintain and improve Oregon's species, habitats and ecosystems.

This document is not intended to be a set of regulations, but rather it presents issues, opportunities and recommended actions that can serve as the basis for regional collaborative actions. The recommendations within the OCS can be used to address species and habitat conservation needs, to expand existing partnerships and develop new ones, and to provide a context for balancing Oregon's conservation and development priorities. The future of many species will depend on landowners' and land managers' willingness to voluntarily take action on their own to improve fish and wildlife habitat.

The OCS works by defining ecoregions and offering an overview of each region that covers a variety of ecological, land use and economic issues. Parts of Deschutes County fall into three of the ecoregions; East Cascade, Blue Mountains and Northern Basin and Range. For Deschutes County this document offers a wealth of knowledge that can be used to inform fish and wildlife habitat policies and protect and enhance ecosystems.

Fish and Wildlife Habitat Mitigation Policy

The ODFW's Fish and Wildlife Habitat Mitigation Policy provides direction for their staff to review and comment on projects that may impact fish and wildlife habitat. This policy recognizes six distinct categories of wildlife habitat ranging from Category 1 – essential, limited, and irreplaceable habitat, to Category 6 – low value habitat. The policy goal for Category 1 habitat is no loss of habitat quantity or quality through avoidance of impacts by using development action if impacts cannot be avoided. The ODFW recommends avoidance of Category 1 habitats as they are irreplaceable, and thus mitigation is not a viable option. Categories 2-4 are for essential or important, but not irreplaceable habitats. Category 5 habitat is not essential or important, but has high restoration potential.

Interagency Report

In 2009 the USFW, ODFW, U.S. Forest Service and the Bureau of Land Management collaborated to provide a report on Wildlife in Deschutes County, *Updated Wildlife Information and Recommendations for the Deschutes County Comprehensive Plan Update* (Interagency Report). This report provided updated information to be used in revising the County Goal 5 inventory. This update will be done as part of the Goal 5 review as described in Section 2.4 of this Plan. The report also outlined numerous issues that the agencies believe are important for the County to address. The Interagency Report generated debate over how best to protect wildlife while also protecting the rights of property owners. Key issues from the report are touched on below.

Economic benefits of fish and wildlife: The report notes the ODFW report by Dean Runyan regarding the economic benefits of fishing, hunting and wildlife viewing, including that Deschutes County generated more freshwater fishing revenue than any other county in Oregon.

Oregon Conservation Strategy: The report discusses the Oregon Conservation Strategy described above and recommends that the County use it as a guide and reference for the maintenance and enhancement of wildlife resources.

Threatened and Endangered Species and Species of Concern: The report recommends developing and adopting measures to protect federal and state listed threatened and endangered species to limit conflicting use.

Riparian and wetland areas for wildlife and fish: The report recommends completing and adopting a Local Wetland Inventory. The current National Wetland Inventory was done at a scale so that wetlands under 5 acres are not identified. Yet, those wetlands provide significant habitat. Deschutes County adopted a Local Wetland Inventory for South County in 2011.

Oregon Spotted Frog: The report recommends adding an Oregon Spotted Frog habitat area to the wildlife area combining zone and provides some specific ideas for protecting those areas. The Oregon Spotted Frog can be found in the floodplains and wetlands along the Deschutes River and Little Deschutes River, south of Bend. Riverine oxbows are particularly key habitat. This frog is listed as a Federal Candidate and State Critical Species.

Shrub-Steppe Habitat: The report recommends the County consider impacts to wildlife and habitat when development will degrade shrub-steppe habitat. Shrub-steppe habitat provides needed resources for numerous birds and mammals, including 12 Oregon listed sensitive species, and one threatened species. Large blocks of un-fragmented habitat with low human disturbance are needed to support shrub-steppe wildlife. If avoidance of these areas is not possible, providing for "no net loss' and a "net benefit" (restoration) of shrub-steppe habitat should be a vital component of any conservation plan.

Greater Sage Grouse: The report provides recommendations for limiting conflicting uses near sage grouse leks and habitat. The population management objective for sage-grouse in this region (Prineville District), which includes portions of Deschutes and Crook counties, is to restore sage grouse numbers and distribution near the 1980 spring breeding population level, approximately 3,000 birds. Many aspects of human development have impacted sage grouse populations and can be considered conflicting uses. Conservation efforts focused on maintaining large expanses of sagebrush habitat, enhancing the quality of existing habitat, and increasing connections between suitable habitat patches would be most beneficial to maintaining healthy sage-grouse populations. Breeding and nesting habitat is particularly important because it is essential, limited and irreplaceable.

Critical Bird and Mammal Sites: The report does not recommend additional or modification of existing protections for site specific sensitive bird and mammal sites, except for additional protections for sage grouse. The report does provide a new inventory and site specific recommendations that will be used to update the list of Goal 5 wildlife resources.

Game Species: The report does not recommend changes to the existing big game winter range or migration corridor maps. It does recommend that the County revise the uses allowed in those areas to prohibit the following uses that generate activity, noise and habitat alteration:

- Guest ranch
- Outdoor commercial events (i.e. Wedding Venues, Farmers Market)
- OHV course
- Paintball course

- Shooting range
- Model airplane park
- BMX course

In 2017, stemming from a Land Use Board of Appeals decision, Deschutes County amended its Wildlife Area Combining Zone to allow churches in deer winter range, elk habitat and antelope range. The reason for the amendment stemmed from the Religious Land Use and Institutionalized Persons Act of 2000 which protects individuals, houses of worship, and other religious institutions from discrimination in zoning laws. Deschutes County determined that allowing churches in the Wildlife Area Combining Zone should be allowed fully.

Sensitive Species: Table 2.7.2 shows species considered sensitive to human disturbance. Mule deer are the only species in decline.

Table 2.7.2 - Big Game Population Estimates, Deschutes County (2009)

Species	*Population*
Mule Deer	9,337*
Elk	1,500
Pronghorn	1,000
Cougar	~150
Black Bear	~150
Silver Grey Squirrel	~800

* The management objective for the Paulina and Upper Deschutes Wildlife Management Units, primarily in Deschutes County, is an April adult population of 18,7000 mule deer.

Source: Interagency Report

Fish and Wildlife Habitat Mitigation Policy: The Interagency Report includes one recommendation that is only from the ODFW. They recommend that the County require impact avoidance for development that will impact Category 1 habitat and require a wildlife mitigation plan for development that will impact habitat Categories 2-5, to limit conflicting uses.

The Interagency Report recommendations will be considered more closely when the Goal 5 review is undertaken.

Future of Wildlife and Habitat in Deschutes County

Coordination

Much of the wildlife habitat in Deschutes County is located on public lands. Federal lands make up 76% of County lands with another 3% State or County owned. Federal lands are not subject to County regulation but as noted in the Forest section of this Plan, they are important economic generators that also contribute to the community's quality of life, providing ample opportunities for wildlife viewing, fishing and hunting. It should be noted that not all federal lands are managed for wildlife habitat.

Regarding public lands the County's role is to coordinate with the land management agencies to ensure development approved by the County does not impact wildlife.

Another area for coordination is with the Trust for Public Lands (TPL). In 2009 this non-profit group initiated a Greenprint effort that will identify specific areas needing protection, including wildlife habitat. A survey done by this organization identified protecting wildlife habitat as important to County residents.

Rural Development

The loss of wildlife species and habitat may lead to declining recreational opportunities, tourist dollars and quality of life. Yet, many species are sensitive to human development, with some species benefiting and some harmed by land disturbance. New structures or infrastructure can fragment habitats. Barriers such as roads, dams or housing can interfere with migration routes and connectivity leading to isolated and unhealthy populations. Development can also increase non-native and invasive species. Most Deschutes County residents consider the local wildlife as one of the benefits of living in this region. With careful planning, many of the impacts to wildlife habitat can be mitigated.

Section 2.6 Wildlife Policies

Goals and Policies

Goal 1 **Maintain and enhance a diversity of wildlife and habitats.**

Policy 2.6.1 Goal 5 wildlife inventories, ESEEs and programs are retained and not repealed.

Policy 2.6.2 Promote stewardship of wildlife habitats and corridors, particularly those with significant biological, ecological, aesthetic and recreational value.

Policy 2.6.3 Ensure Goal 5 wildlife inventories and habitat protection programs are up-to-date through public processes and expert sources, such as the 2009 Interagency Report.

Policy 2.6.4 Support incentives for restoring and/or preserving significant wildlife habitat by traditional means such as zoning or innovative means, including land swaps, conservation easements, transfer of development rights, tax incentives or purchase by public or non-profit agencies.

Policy 2.6.5 Assist in providing information and education on wildlife and habitat protection.

Policy 2.6.6 Review the Oregon Conservation Strategy when amending the Wildlife section of this Plan.

Policy 2.6.7 Use a combination of incentives, regulations and education to promote stewardship of wildlife habitat and address the impacts of development.

Policy 2.6.8 Balance protection of wildlife with wildland fire mitigation on private lands in the designated Wildland Urban Interface.

Goal 2 **Promote the economic and recreational benefits of wildlife and habitat.**

Policy 2.6.9 Encourage wildlife related tourism.

Policy 2.6.10 Coordinate with stakeholders to ensure access to significant wildlife and riparian habitat through public or non-profit ownership.

Goal 3 **Support retaining populations of Federal and State protected endangered species.**

Policy 2.6.11 Develop local approaches, in coordination with Federal and State agencies, for protecting Federal or State Threatened or Endangered Species or Species of Concern.

Policy 2.6.12 Address potential conflicts between large-scale development and sage grouse habitat using Ordinances Nos. 2010-010 and 2010-011, which are consistent with OAR 660-023-0115.

Section 5.3 Goal 5 Inventory
Water Resources

Background

This section contains information from the 1979 Deschutes County Comprehensive Plan as revised and the 1986 Deschutes County/City of Bend River Study. It lists the water resources in Deschutes County. These inventories have been acknowledged by the Department of Land Conservation and Development as complying with Goal 5. No changes have been proposed for the 2010 Comprehensive Plan update.

Goal 5 requires the following water resources be inventoried and the inventories are listed below.

- Riparian corridors, including water and riparian areas and fish habitat
- Wetlands
- Federal Wild and Scenic Rivers
- State Scenic Waterways
- Groundwater Resources

Also included in these inventories are Significant Lakes and Reservoirs.

Riparian Corridors

Inventories

Table 5.3.1 Deschutes County River Miles

Waterway	***Miles***
Deschutes River	97
Little Deschutes River	42
Whychus Creek (lower 6 miles in Jefferson County)	39
Tumalo Creek	16
Paulina Creek	10
Fall River	8
Crooked River	7

Source: Deschutes County/City of Bend River Study 1986

Table 5.3.2 Deschutes County Goal 5 Riparian Inventory

Streams	***Riparian Acres***
Deschutes River	1,440
Little Deschutes River	2,920
Paulina Creek	846
Indian Ford Creek	573
Tumalo Creek	50
Fall Creek	47
Whychus Creek	43
Crooked River	38

Source: 1979 Deschutes County Comprehensive Plan as revised and Deschutes County/City of Bend River Study 1986

Table 5.3.3 Deschutes County Goal 5 Floodplains Adjacent to Rivers and Streams

Deschutes River	Little Deschutes River
Crooked River	Spring River
Dry River	Paulina Creek
Indian Ford Creek	Long Prairie
Whychus Creek	

Source: 1979 Deschutes County Comprehensive Plan as revised and Federal Emergency Management Agency maps

Table 5.3.4 Deschutes County Goal 5 Perennial Streams

Bottle Creek	Full Creek	Spring Creek
Bridge Creek	Goose Creek	Three Creek
Brush Draw	Indian Ford Creek	SF Tumalo Creek
Bull Creek	Jack Creek	NF Whychus Creek
Cache Creek	Kaleetan Creek	Soda Crater Creek
Charlton Creek	Metolius Creek	NF Trout Creek
Cultus Creek	Park Creek EF	NF Tumalo Creek
Cultus River	Park Creek WF	MF Tumalo Creek
Deer Creek	Pole Creek	First Creek
Dry Creek	Rock Creek	Soap Creek
Fall Creek	Snow Creek	Todd Lake Creek

Note: All of these streams, except portions of Indian Ford Creek, Cache Creek and Dry Creek, are located on federal land and are subject to either the Deschutes National Forest or the Bureau of Land Management Resource Management Plans.

Source: 1979 Deschutes County Comprehensive Plan as revised

Table 5.3.5 Deschutes County Riparian Ownership

River or Stream	*Ownership*
Deschutes River	Private/Federal
Little Deschutes River	Private/Federal
Fall River	Private/Federal
Tumalo Creek	Private/Federal
Three Creek	Private/Federal
Whychus Creek	Private/Federal
Trout Creek	Private/Federal
Dry Creek	Private/Federal
Cache Creek	Private/Federal
Indian Ford Creek	Private/Federal
Cultus River	Federal
Charlton Creek	Federal
Deer Creek	Federal
Cultus Creek	Federal
Quinn Creek	Federal
Fall Creek	Federal
Moore Creek	Federal

Source: 1979 Deschutes County Comprehensive Plan as revised

Wetlands

Inventory: In 1992 Deschutes County Ordinance 92-045 adopted all wetlands identified on the U. S. Fish and Wildlife Service National Wetland Inventory Maps as the Deschutes County wetland inventory. Additionally, Deschutes County Ordinance 2011-008 adopted a Local Wetland Inventory (LWI) covering 18,937 acres in South Deschutes County.

Federal Wild and Scenic Rivers

Inventory: The following segments of the Deschutes River have been designated as Federal Recreation and Scenic rivers by the passage of the 1988 Omnibus Oregon Wild and Scenic Rivers Act of 1988. Congress mandates the US Forest Service to prepare a management plan for these segments of the Deschutes River.

Table 5.3.6 Deschutes County Wild and Scenic River Segments

Waterway	***Description***
Deschutes River	From Wickiup Dam to Fall River (22 miles)
Deschutes River	Fall River to N boundary Sun River (20 miles)
Deschutes River	N boundary Sun River to Bend UGB (13 miles)
Whychus Creek (formerly Squaw Creek)	Includes all tributaries within the Three Sisters Wilderness, Soap Creek and the main stem from the wilderness boundary to the stream flow gauge station

Source: County Ordinance 92-052

Oregon Scenic Waterways

Inventory: The following segments of the Deschutes River have been designated as State Scenic Waterways by the State Legislature or a 1988 Ballot.

Table 5.3.7 Deschutes County Oregon Scenic Waterway Segments

Waterway	***Description***
Deschutes River	From Little Lava Lake to Crane Prairie Reservoir (12 miles)
Deschutes River*	From Wickiup Dam to General Patch Bridge (28 miles)
Deschutes River	From Harper Bridge to the COI diversion (21 miles)
Deschutes River*	From Sawyer Park to Tumalo State Park (5 miles)
Deschutes River	From Upper Deschutes Market Road to the County line (28 miles)
Little Deschutes	12 miles

Source: County Ordinance 92-052

Groundwater Resources

Inventory: Groundwater in the Deschutes River Basin in Deschutes County connects with surface water according to the U.S. Geological Survey.

Landscape Management Rivers and Streams

Inventory: Please see Section 5.5 of this Plan for the list of Landscape Management Rivers and Streams.

Significant Lakes and Reservoirs

Inventory: The following lakes are significant open space resources in the county. The land adjacent to the lakes is also an important open space and a recreational resource. All of the inventoried lakes and reservoirs except parts of Tumalo Reservoir are under federal ownership and management.

Table 5.3.8 Deschutes County Significant Lakes and Reservoirs

River or Stream	*Township*	*Range*	*Section*
Bobby Lake	T 22S	R 06E	14
Charlton Lake	T 21S	R 06E	14
Crane Prairie Reservoir	T 21	R 08E	16
Cultus Lake	T 20S	R 07E	24
Deer Lake	T 20S	R 07E	
Devils Lake	T 18 S	R 08E	NW1/2 SEC. 10
Davis Lake	T 22S	R 07E	
East Lake	T 21S	R 13E	31
Elk Lake	T 18S/19S	R 07E	5
Hosmer Lake	T 19S	R 08E	4
Lava Lake	T 19S	R 08E	22
Little Cultus Lake	T 20S	R 07E	
Little Lava Lak	T 19S	R 08E	22
North Twin Lake	T 21S	R 08E	28
Paulina Lake	T 21S	R 12E	84
South Twin Lake	T 21S	R 08E	28
Sparks Lake	T 18S	R 08E	23
Three Creeks Lake	T 17S	R 09E	14
Todd Lake	T 18S	R 09E	8
Upper Tumalo Reservoir	T 16S	R 11E	33
Winopee Lake	T 19S	R 11E	33
Wickiup Reservoir	T 22S	R 09E	7

Source: Deschutes County Ordinance 92-052

Section 5.4 Goal 5 Inventory
Wildlife Habitat

Background

This section contains wildlife resource information from the 1979 Deschutes County Comprehensive Plan as revised. These inventories have been acknowledged by the Department of Land Conservation and Development as complying with Goal 5. No changes have been proposed for the 2010 Comprehensive Plan update. However, an updated inventory has been provided as described in Section 2.6 of this Plan and will be incorporated at a later date.

Table 5.4.1 – Bird Inventory

Birds Selected List 1992	***Use Period*** S = Summer W = Winter X = Year round	***Relative Abundance*** A = Abundant C = Common F = Few R = Rare U = Unknown
American Avocet	S	F
American Bittern	S	F
American Coot	X	C
American Goldfinch	S	C
American Destrel	X	C
American Widgeon	X	C
Anna's Hummingbird	S	F
Ash-throated Flycatcher	S	F
Bald Eagle	X	F
Bank Swallow	S	F
Barn Owl	X	C
Barn Swallow	S	C
Barred Owl	X	U
Belted Kingfisher	X	F
Bewick's Wren	X	F
Black-backed Woodpecker	X	F
Black-billed Magpie	X	C
Black-capped Chickadee	W	F
Black-chinned Hummingbird	S	F
Black-crowned Night Heron	S	F
Black-headed Grosbeak	S	F
Black-throated Grey Warble	S	F
Blue Grouse	X	F
Blue-winged Teal	S	F
Bohemian Waxwing	W	F
Boreal Owl	X	F
Brewer's Blackbird	X	C
Brewer's Sparrow	S	F
Brown Creeper	X	F

Birds Selected List 1992	***Use Period*** S = Summer W = Winter X = Year round	***Relative Abundance*** A = Abundant C = Common F = Few R = Rare U = Unknown
Brown-headed Cowbird	S	C
Bufflehead	X	C
Burrowing Owl	S	R
California Valley Quail	X	C
Calliope Hummingbird	S	F
Canada Goose	X	C
Canyon Wren	X	C
Caspian Tern	S	F
Cassin's Finch	X	C
Cedar Waxwing	X	C
Chipping Sparrow	S	C
Chukar Partridge	X	R
California Gull	X	C
Clark's Nutcracker	X	C
Cliff Swallow	S	C
Common Bushitit	X	C
Common Crow	X	R
Common Loon	S	R
Common Merganser	X	C
Common Nighthawk	S	C
Common Raven	X	C
Common Snipe	S	F
Coopers Hawk	X	C
Dark-eyed Junco	X	A
Dipper	X	F
Double-crested Cormorant	S	C
Downy Woodpecker	X	C
Dusky Flycatcher	S	F
Eared Grebe	W	F
Eastern Kingbird	S	F
Evening Grosbeak	X	C
Ferruginous Hawk	S	F
Flammulated Owl	S	F
Fox Sparrow	S	C
Franklin's Gull	S	F
Gadwall	W	F
Golden Eagle	X	F
Golden-crowned Kinglet	X	F
Goldeneye	X	C
Goshawk	X	F
Gray Jay	X	C
Gray Partridge	X	R
House Sparrow	X	C

Birds Selected List 1992	***Use Period*** S = Summer W = Winter X = Year round	***Relative Abundance*** A = Abundant C = Common F = Few R = Rare U = Unknown
House Wren	S	F
Killdeer	X	C
Lark Sparrow	S	F
Lazuli Benging	S	F
Least Sandpiper	S	F
Lesser Goldfinch	X	R
Lesser Scaup	W	C
Lewis' Woodpecker	S	F
Lincoln's Sparrow	X	F
Loggerhead Shrike	X	F
Long-billed Curlew	S	R
Long-billed Marsh Wren	S	F
Long-eared Owl	X	F
MacGillivray's Warbler	S	F
Mallard	X	C
Merlin	W	R
Mountain Bluebird	X	C
Mountain Chickadee	X	C
Mourning Dove	X	C
Nashville Warbler	X	F
Northern Harrier	X	F
Northern Oriole	S	F
Northern Phalarope	S	F
Three-toed Woodpecker	X	F
Olive-sided Flycathcer	S	C
Orange-crowned Warbler	S	F
Osprey	S	C
Peregrine Falcon	X	R
Pileated Woodpecker	X	F
Pine Grosbeak	X	R
Pine Siskin	X	C
Pinon Jay	X	C
Pintail	W	C
Prairie Falcon	X	C
Purple Finch	X	F
Pygmy Nuthatch	X	C
Pygmy Owl	X	F
Red Crossbill	X	F
Red-breasted Nuthatch	X	C
Redhead	W	F
Red-shafted Flicker	X	C
Red-tailed Hawk	X	C
Red-winged Blackbird	X	C

Birds Selected List 1992	***Use Period*** S = Summer W = Winter X = Year round	***Relative Abundance*** A = Abundant C = Common F = Few R = Rare U = Unknown
Ring-billed Gull	X	C
Ring-neck Duck	W	F
Ring-necked Pheasant	X	F
Robin	X	C
Rock Dove	X	C
Rock Wren	S	C
Rosy Finch	X	R
Rough-legged Hawk	W	C
Rough-winged Swallow	S	F
Ruby-crownedKinglet	X	F
Ruffed Grouse	X	F
Ruffous Hummingbird	S	F
Rufous-sided Towhee	X	F
Sage Grouse	X	F
Sage Sparrow	S	R
Sage Trasher	S	C
Sandhill Crane	S	F
Song Sparrow	X	F
Sora	S	F
Spotted Owl	X	F
Spotted Sandpiper	S	F
Starling	X	C
Steller's Jay	X	F
Swainson's Hawk	S	R
Swainson's Thrush	S	F
Townsend's Solitaire	X	C
Tree Swallow	S	C
Turkey	X	C
Turkey Vulture	S	C
Varied Thrush	X	F
Vaux's Swift	S	F
Vesper Sparrow	S	F
Violet-green Swallow	S	C
Virginia Rail	S	F
Warbling Vireo	S	F
Water Pipit	X	F
Western Bluebird	S	F
Western Flycatcher	S	F
Western Grebe	S	C
Western Kingbird	S	F
Western Meadowlark	S	C
Western Sandpiper	S	F
Western Taager	S	F

Birds Selected List 1992	***Use Period*** S = Summer W = Winter X = Year round	***Relative Abundance*** A = Abundant C = Common F = Few R = Rare U = Unknown
Western Wood Pewee	S	F
White-breasted Nuthatch	X	F
White-crowned Sparrow	S	F
White-headed Woodpecker	X	F
Wigeon	X	F
Williamson's Sapsucker	X	F
Willow Flycatcher	S	R
Wilson's Phalarope	S	R
Wilson's Warbler	S	F
Winter Wren	X	F
Wood Duck	S	F
Yellow Warbler	S	F
Yellow-bellied Sapsucker	X	F
Yellow-headed blackbird	S	F
Yellowthroat	S	F

Source: 1979 Deschutes County Comprehensive Plan as revised

Table 5.4.2 – Amphibian and Reptile Inventory

Amphibians and Reptiles Selected List 1992	***Use Period*** S = Summer W = Winter X = Year round	***Relative Abundance*** A = Abundant C = Common F = Few R = Rare U = Unknown
Bullfrog	X	F
Cascades Frog	X	F
N. Grasshopper Mouse	X	F
Northern Water Shrew	X	F
Norway Rat	X	F
N. Pocket Gopher	X	U
Ord's Kangaroo Rat	X	C
Pacific Mole	X	U
Pallid Bat	S	U
Pine Marten	X	C
Pinon Mouse	X	F
Porcupine	X	C
Pronghorn Antelope	X	C
Raccoon	X	C
Red Fox	X	F
River Otter	X	C
Rocky Mtn Elk	X	C
Roosevelt Elk	X	C
Sagebrush Vole	X	C

Amphibians and Reptiles Selected List 1992	***Use Period*** S = Summer W = Winter X = Year round	***Relative Abundance*** A = Abundant C = Common F = Few R = Rare U = Unknown
Shorttail Weasel	X	F
Silver-haired Bat	S	U
Small-footed Myotis	S	U
Snowshoe Hare	X	F
Striped Skunk	X	C
Townsend Ground Squirrel	X	C
Townsends Big-eared Bat	X	F
Trowbridge Shrew	X	F
Vagrant Shrew	X	U
Water Vole	X	C
Western Gray Squirrel	X	C
Western Harvest Mouse	X	C
Western Jumping Mouse	X	F
Western Pipistrel	S	U
Whitetail Jackrabbit	X	R
Wolverine	X	R
Yellow Pine Chipmunk	X	C
Yellow-bellied Marmot	X	F
Yama Myotis	X	F
Common Garter Snake	X	F
Ensatina	X	R
Gopher Snake	X	C
Great Basin Spadefoot Toad	X	F
Long-toed Salamander	X	F
Night Snake	X	U
Northern alligator Lizard	X	F
Pacific Tree Frog	X	C
Racer	X	F
Red-legged Frog	X	F
Roughskin Newt	X	R
Rubber Boa	X	F
Sagebrush Lizard	X	F
Sharp-tailed Snake	X	U
Short-horned Lizard	X	R
Side-blotched Lizard	X	U
Spotted Frog	X	F
Striped Whipsnake	X	U
Tailed Frog	X	F
Western Fence Lizard	X	C
Western Rattlesnake	X	F
Western Skink	X	F
Western Toad	X	F

Source: 1979 Deschutes County Comprehensive Plan as revised

Table 5.4.3 – Goal 5 Fish Distribution Inventory

	tlantic Salmon	*Coho Salmon*	*Rainbow Trout*	*Brown Trout*	*Cutthroat Trout*	*Brook Trout*	*Lake Trout*	*Dolly Varden Trout*	*Kokanee*	*Mountain Whitefish*	*Largemouth Bass*	*Bluegill*	*Brown Bullhead*	**Bridglip Sucker**	**Tui Chub**	**Gayling**	***Crayfish***
Tyee Creek						2											
Hell Creek						2											
Spring River				2		2				1					2		1
Tumalo Creek			1			2											
Bridge Creek						2											
Fall Creek						2											
Satan Creek						2											
Soda Creek						2											
Crater Creek						2											
Goose Creek						2											
Indian Ford Creek			1			2							2				
Trout Creek			1														
Alder Creek			1														
Whychus Creek			1			2											
Pole Creek						2											
Snow Creek			1			2											
Deschutes River		3	*	2		2		3	1						2		1
Little Deschutes River			1	2		2			1			2			2		1
Park Creek						2											
Three Creeks Creek			3			3											
Sink Creek						2											
Deer Creek			1			2											
Quinn River			*			2		2	1						2		1
Quinn Creek	3					2											
Cultus Creek			*			2											
Cultus Lake, Big			3			2	2		1						2		1
Cultus Lake, Little			2			3											
Cultus River						2		2	1								
Moore Creek						2											
Charlton Creek						2											
Long Prairie Slough												2					2
Browns Creek			2	2		2		#	1								1
Fall River			*	2		2			1						2		1
Paulina Creek			3												2		1
Cache Creek			1														
Crane Prairie Res.			*			#		2	1	2					2		1
Wickiup Reservoir		3	3	#				#	1						2		1
Three Creeks Lake			3			3											
Devil's Lake			3			2											
Hosmer Lake	3					3											1
Irish Lake						3											

1 - Native, naturally reproducing
2 - Introduced, naturally reproducing
3 - Introduced, periodic stocking required to maintain population
* - 1 and 3
\# - 2 and 3

Source: 1979 Deschutes County Comprehensive Plan as revised

Table 5.4.4 Recommended Minimum Flows for Fish Life

Stream	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Deschutes River (1)	200	200	200	200	200	200	200	200	200	200	200	200
Deschutes River (2)	400	400	400	400	400	400	400	400	400	400	400	400
Deschutes River (3)	660	660	660	660	660	660	660	660	660	660	660	660
Deschutes River (4)	300	300	300	300	300	300	300	300	300	300	300	300
Deschutes River (5)	80	80	80	80	80	80	80	80	80	80	80	80
Deschutes River (6)	40	40	60	60	60	40	40	40	60	60	60	60
Whychus Creek (7)	20	10	10	10	10	10	10	10	10/20	30	20	20
Whychus Creek (8)	10	10/20	30	30	30	20	10	10	10	10	10	10
Indian Ford Creek	4	3	3	3	3	3	3	3	3/4	6	4	4
Tumalo Creek	35	35	47	47	47	5	10	10	10/35	47	35	35
Spring River	300	300	300	300	300	300	300	300	300	300	300	300
Little Deschutes River	80	80	80	200	200	150	100	100	100	100	200	200
Fall River	70	70	100	100	100	70	50	50	50	100	100	100
Browns Creek	15	15	25	25	25	15	15	15	25	25	25	25
Quinn River	20	20	20	20	20	20	20	20	20	20	20	20
Cultus Creek	20	20	32	32	32	20	5	5	5/20	32	20	20
Cultus River	50	50	50	50	50	50	50	50	70	70	70	70
Snow Creek	15	15	30	30	30	20	15	15	15	30	30	20
Quinn Creek	20	20	20	12	12	12	12	12	12/20	35	35	35
Soda Creek	20	20	20	6	6	6	6	6	6/20	31	31	31
Fall Creek	35	35	35	20	20	20	20	20	20/35	46	46	46
Goose Creek	7	7	7	4	4	4	4	4	4/7	10	10	10
Three Creek	7	7	10	10	10	7	2	2	2/7	10	7	7

[1] Flows are expressed in cubic feet per second. The recommended flows should arrive at the point of recommendation and continue to the mouth of the stream or to the next point for which a different flow is recommended. Stream flows recommended in Appendix 1 are designed for game fish production and are not necessarily adequate for wildlife, especially waterfowl and furbearers. Neither would they necessarily be recommended below future impoundments.

(1) Bend to Round Butte Reservoir
(2) L. Deschutes R. to Spring River
(3) Spring River to Bend
(4) Wickiip Dam to Little Deschutes River
(5) Crane Prairie Dam to Wickiup Reservoir
(6) At USGS Gate 14-0500
(7) Below USGS Gage 14-0750
(8) Below Camp Polk

Source: 1979 Deschutes County Comprehensive Plan as revised

Table 5.4.5 – Instream Water Right Program (3/1/92) Database Summary Report

BASIN 05	STREAM > PARENT STREAM	UPSTREAM LIMIT	DOWNSTREAM LIMIT	SPECIES	APP NO.	CERT #	DATE
05	Deschutes R > Columbia R	Crn Prairie Res	Wickiup Res	RB, BT, BR, CO, K	070764		10/11/90
05	Deschutes R > Columbia R	Little Lava Lk	Crn Prairie Res	RB, BT, K, WF	070763		10/11/90
05	Deschutes R > Columbia R	193.0	190.0		MPS	59777	11/03/83
05	Deschutes R > Columbia R	227.0	193.0		MPS	59776	11/03/83
05	Deschutes R > Columbia R	190.0	165.0		MPS	59778	11/03/83
05	Fall R > Deschutes R	Gage 14057500	Mouth	RB, BT, BR, WF	070762		10/11/90
05	Indian Ford Cr > Whychus Cr	Headwaters	Mouth	RB	070760		10/11/90
05	Little Deschutes R > Deschutes R	Crescent Cr	Mouth	RB, BT, BR, WF	070757		10/11/90
05	Metolius R > Deschutes R	Metolius Spring	Canyon Cr	BUT, K	070699		09/24/90
05	Snow Cr > Deschutes R	Headwaters	Mouth	RB, BT	070756		10/11/90
05	Whychus Cr > Deschutes R	S Fk Whychus Cr	Indian Ford Cr	RB, BT	070754		10/11/90
05	Tumalo Cr > Deschutes R	S Fk Tumalo Cr	Mouth	RB, BT, BR	070752		10/11/90

Source: 1979 Deschutes County Comprehensive Plan as revised

Bird Sites – source: 1979 Deschutes County Comprehensive Plan as revised

Bald Eagle Habitat Sites on Non-Federal Land or with Non-Federal Sensitive Habitat Areas.

Site #	*Taxlot*	*Quarter Section*	*Site Name*
DE0035-00	15-10-00-1400	23NWNE	Cloverdale NW
DE0035-01	15-10-00-1400	23NENE	Cloverdale NE

The Oregon Department of Fish and Wildlife (ODFW) has identified two bald eagle nests in Township 15S, Range 10E, Section 23, Tax Lot 1400. The ODFW identifiers for these sites are DE0035-00 and DE0035-01. The sites are also known as Cloverdale. The sites are described in the Oregon Department of Fish and Wildlife Central Region Administrative Report No. 93-1. The sensitive habitat area is identified as the area east of Highway 20 that is within a 1/4-mile radius of each nest site.

Site #	*Taxlot*	*Site Name*
DE0036-00	17S-11E-26-5900	Shevlin Park

The Oregon Department of Fish and Wildlife (ODFW) has inventoried a former bald eagle nest site in Township 17S, Range 11E, Section 26, Tax Lot 5900. The ODFW identifier for this site is DE0036-00. The site is also known as Shevlin Park. The site is described in the Oregon Department of Fish and Wildlife Central Region Administrative Report No. 93-1.

Site #	*Taxlot*	*Site Name*
DE0037-00	22S-09E-04-4500	Wickiup Reservoir

The Oregon Department of Fish and Wildlife (ODFW) has identified a bald eagle nest in Township 22S, Range 09E, Section 04, Tax Lot 500. The ODFW identifier for this site is DE0037-00, Wickiup Reservoir. The site is described in the Oregon Department of Fish and Wildlife Central Region Administrative Report No. 93-1.

Site #	*Taxlot*	*Site Name*
DE0038-00	22S-09E-34-500	Haner Park

The Oregon Department of Fish and Wildlife (ODFW) has identified a bald eagle nest in Township 22S, Range 09E, Section 34, Tax Lot 500. The ODFW identifier for this site is DE0038-00, Haner Park. The site is described in the Oregon Department of Fish and Wildlife Central Region Administrative Report No. 93-1.The sensitive habitat area includes the area within one-quarter mile of the nest site.

Site #	*Taxlot*	*Site Name*
DE0039-00	22S-09E-06-500	Wickiup Dam

The Oregon Department of Fish and Wildlife (ODFW) has identified a bald eagle nest in Township 22S, Range 09E, Section 06, Tax Lot 500. The ODFW identifier for this site is DE0039-00, Wickiup Dam. The site is described in the Oregon Department of Fish and Wildlife Central Region Administrative Report No. 93-1.

Site #	*Taxlot*	*Quarter Section*	*Site Name*
DE0046-00	20-10-34-3401	34NWSE	Bates Butte

The Oregon Department of Fish and Wildlife (ODFW) has identified a bald eagle nest in Township 20S, Range 10E, Section 34, Tax Lot 3401. The ODFW identifier for this site is DE0046-00, Bates Butte. The site is described in the Oregon Department of Fish and Wildlife Central Region Administrative Report No. 93-1. The sensitive habitat area includes the area within one-quarter mile of the nest site.

Great Blue Heron Rookery – Black Butte Ranch

The Oregon Department of Fish and Wildlife (ODFW) identified a great blue heron rookery in Township 14S, Range 9E, Section 10 SENE. The County inventoried and adopted this site as a Goal 5 resources in Ordinance 92-041.

Golden Eagle Sites

Table 5.4.6 – Golden Eagle Nest Site Inventory on Non-Federal Land or with Non-Federal Sensitive Habitat Area

ODFW Site #	*Taxlot*	*Quarter Section*	*General Location*
DE-0002-00	14-13-11-100	11/SENW	Smith Rock State Park
DE-0002-01	14-13-11-100	11/SENW	Smith Rock State Park
DE-0002-02	14-13-11-100	11/SENW	Smith Rock State Park
DE-0002-03	14-13-11-100	11/NWNE	Smith Rock State Park
DE-0002-04	14-13-11-100	11/NWNE	Smith Rock State Park
DE-0002-05	14-13-11-100	11/NWNE	Smith Rock State Park
DE-0002-06	14-13-11-100	11/NWNE	Smith Rock State Park
DE-0006-00	15-12-00-1502	35/SENE	Mid Deschutes
DE-0006-01	15-12-00-1502	35/SENE	Mid Deschutes
DE-0006-02	15-12-00-1502	35/SENE	Mid Deschutes
DE-0006-04	15-12-00-1502	35/SENE	Mid Deschutes
DE-0006-05	15-12-00-1503	35/NESE	Mid Deschutes
DE-0009-00	14-12-22D-300	23/NWSW	N. Odin Falls
DE-0011-00	15-12-00-100	1/NWSE	Radio Tower/Deschutes
DE-0011-01	15-12-00-100	1/NESE	Radio Tower/Deschutes
DE-0012-00	15-11-00-800	3/NENE	Upper Deep Canyon
DE-0014-00	16-11-00-7800	29/NWSE	Tumalo Dam
DE 0015-01	14-11-00-400	3/NENW	Whychus Creek
DE 0015-00	14-11-00-400	3/SESW	Rimrock Ranch
DE-0029-00	20-17-00-3801	36/NWSE	Twin Pines
DE-0034-00	15-10-00-1400	15/SENW	Lazy Z/USFS
DE-0034-01	15-10-00-1400	15/SENW	Lazy Z/USFS

Source: 1979 Deschutes County Comprehensive Plan as revised

Table 5.4.7 – Prairie Falcon Nest Site Inventory on Non-Federal Land or with Non-Federal Sensitive Habitat Area

ODFW Site #	*Taxlot*	*Quarter Section*	*General Location*
DE 0016-00	22-16-00-100	12/SWSE	Dickerson Flat
DE 0031-00	16-11-00-5600	20/NESE	Tumalo Dam
DE 0031-01	16-11-20-400	20/SESW	Tumalo Dam
DE 0794-01	14-13-11-100	11/NWSW	Smith Rock State Park

Source: 1979 Deschutes County Comprehensive Plan as revised

Table 5.4.8– Osprey Nest Site Inventory on Non-Federal Land or with Non-Federal Sensitive Habitat Area

ODFW Site #	*Taxlot*	*Quarter Section*	*General Location*
DE 0080-00	20-11-00-1300	07/NWNE	Sunriver/ Meadowland

Source: 1979 Deschutes County Comprehensive Plan as revised

Table 5.4.9 – Upland Game Bird Habitat

Ring-necked Pheasant	200
Valley Quail	10,000
Mountain Quail	50
Chukar Partridge	300
Turkey	50
Blue Grouse	900
Sage Grouse	1,800
Ruffed Grouse	100
Mourning Dove	8,000

Source: 1979 Deschutes County Comprehensive Plan as revised

Table 5.4.10 – Sage Grouse Lek Inventory on Non-Federal Lands or with Non-Federal Sensitive Habitat Areas

ODFW Site #	*Taxlot*	*Quarter Section*	*General Location*
DE 0994-01	20-18-00-700	05/SWSE	Circle F Reservoir
DE 0995-01	20-19-00-800	06/NWSE	Merril Rd
DE 0996-01	22-17-00-600	06/SWSW	Dickerson Well
DE 0997-01	20-16-00-2400	25/SENW	Moffit Ranch
DE 0997-02	20-16-00-2400	26/NENE	Moffit Ranch Satellite
DE 0998-01	20-14-00-400	10/NWNW	Evans Well
DE 0998-02	20-14-00-400	10/SWNW	Evans Well Satellite
DE 0999-01	19-14-00-2200	26/SESE	Millican Pit

Source: 1979 Deschutes County Comprehensive Plan as revised