## FISH AND WILDLIFE AREAS AND HABITATS

In 2012, the following information was provided by the Oregon Department of Fish and Wildlife (ODFW). Big game that are considered sensitive in the County are Mule Deer, Rocky Mountain Elk, and Pronghorn Antelope. ODFW has indicated that Deer populations have declined during recent years mostly due to disease. Deer populations are expected to increase and again reach management objectives. ODFW has indicated that Elk populations have been doing very well with minor gains in antelope numbers during the past ten years. Improved aerial surveys, telemetry studies, and personal communication with various landowners have provided additional information on the distribution of Elk in Crook County, which has been used to update the Elk Winter Range Map. This same information has been used to make minor modifications on Deer and Antelope Winter Range Maps to improve their accuracy.

In 2012, the Oregon Department of Fish and Wildlife has provided the County with detailed maps indicating big game winter range within the County. ODF&W has indicated the new 2012 maps increase big game winter range by approximately 3.4%. These areas have been compiled onto composites to show the overall impact on the County.

The following identifies the amount of acreage involved with this map change.

- Rocky Mountain Elk Winter Range - 881,361 acres.
- Antelope Winter Range - 299,118 acres.
- Mule Deer Winter Range - 1,178,422 acres
- Critical Winter Deer Range - 354,445 acres.

The County GIS system software was used to calculate new acreages. It is noted that the big game ranges overlap each other significantly and should not be taken as separate totals.

~~The following information was provided by the Oregon Department of Fish and Wildlife in 1990. Big game that are considered sensitive in the County are mule deer, Rocky Mountain Elk, and Pronghorn Antelope. Deer populations have declined during the past few years, primarily because of the drought and severe winter weather conditions. Population levels in the County are currently 45-65 percent of ODFW's management objectives. With improved weather conditions, deer populations are expected to increase and again reach management objectives. Elk and antelope numbers have been increasing at a moderate pace during the past ten years. See the table below for the current (1990) population estimates. Improved aerial surveys, telemetry studies, and personal communication with various landowners have provided additional information on the distribution of elk in Crook County. This information has been used to update the elk winter range maps for the County. Additional survey information and the use of larger scale maps have also permitted minor modifications on deer and antelope winter range maps to improve their accuracy. Small numbers of Black Bear and Cougar also exist in the County. Their numbers have been increasing slowly over the past ten years.~~

| ~~Species~~ | ~~Number~~ |
|---|---|
| ~~Mule Deer~~ | ~~12,660~~ |

~~Rocky Mountain Elk 1,500~~

~~Pronghorn Antelope 1,400~~

~~Black Bear 35~~

~~Cougar 14~~

~~The Oregon Department of Fish and Wildlife has provided the County with detailed maps indicating big game winter range within the County. These have been compiled onto composites to show the overall impact on the County. There is a vast amount of acreage involved. Rocky Mountain Elk winter range includes 580,685 acres. The antelope winter range includes 280,425 acres. The mule deer winter range includes 861,066 acres with 354,445 acres listed as Critical Winter Deer Range. The methodology in deriving these numbers is simply after the composites were created to use a computerized plenometer to estimate the total acreages involved. It is noted that the big game ranges overlap each other significantly and should not be taken as separate totals.~~

~~Crook County in its acknowledged Comprehensive Plan contains policies for the protection of wildlife habitat, including Wildlife Policy 2 which states "Density with a Crucial Wintering Area for deer shall not be greater than one residence per 160 acres and for the General Winter Range not more than one residence per 80 acres." Wildlife Policy 3 states "Elk wintering areas shall not have more than one residence per 320 acres." However, these policies are not carried over into the Crook County Zoning Ordinance. Therefore, there is the potential for conflicting uses at the present time.~~

**Conflicting Uses**

~~The most significant conflicting use to big game habitat in Crook County is an increase in density of residential dwellings in the habitat area. There are economic, social, environmental, and energy consequences involved with the potential conflicting use.~~

Nearly all uses requiring land use approval represent potential conflicts to big game habitat. The county will use the following categories for purposes of evaluating the potential Economic, Social, Environmental and Energy (ESEE) consequences of prohibiting, full allowing or partially allowing conflicting uses in bag game habitat.

Residential Uses – Single Family dwellings and accessory structures.

Small Scale Uses– Affect less than 5 acres and result in fewer than 50 new vehicle trips per day on average.

Medium Scale Uses Affect 5-20 acres or generate between 50 and 200 new vehicle trips per day on average.

Large Scale Uses Affect 20 or more acres or generate more than 200 new vehicle trips per day on average

**ESEE Consequences**

Please see Appendix XYZ for the county's ESEE Consequences analysis and a complete description of the Goal 5 process.

~~**Economic Consequences**~~

~~The Oregon Department of Fish and Wildlife has indicated Crook County generated approximately three million dollars of economic activity for big game hunting in the year of 1987. Loss of habitat will significantly reduce the number of big game and have a direct impact on the economic benefits derived from big game hunting.~~

~~**Social Consequences**~~

~~Loss of big game habitat will reduce the social values achieved by Crook County over the long term. The County is famed for its rural lifestyle and the attendant social values that accompany that lifestyle. In the long term, reduction of big game habitat will lessen those social values.~~

~~**Environmental Consequences**~~

~~Loss of big game habitat will result in degradation of other factors of the environment with the decrease in numbers throughout the food chain.~~

~~**Energy Consequences**~~

~~Increased residential dwelling development in the big game habitat areas generally causes scatteration of distribution systems for energy, resulting in more costly energy prices for the consumer.~~

**Program To Achieve The Goal**

In order to protect the big game habitat, the Comprehensive Plan policies must be carried over and enacted directly into the County Zoning Ordinance ~~for the EFU-I, EFU-2, EFU-3, and F-l zones~~.

~~By placing the density requirement standards in the specific resource zone, the acknowledged exception areas are exempted from these requirements.~~

**WILDLIFE POLICIES**

~~I. All crucial wildlife areas indicated on the inventory map shall be classified as exclusive agriculture, grazing, forest or open space. No major land use change shall be permitted without a conditional use permit~~.

~~2. Density within Crucial Wintering Areas for deer shall not be greater than one residence for each 160 acres and for the General Winter Range, not more than one residence for 80 acres, except in the EFU-3 zone in which 40 acres may be allowed per residence. (Ordinance No. 71; 7/28/92)~~

~~3. Elk wintering areas shall not have more than one residence per 320 acres.~~

4. To preserve valuable upland game bird habitat, urban sprawl and scattered residential use on agricultural lands shall be prohibited.

5. Channelization and overgrazing of river and stream channels shall be discouraged.

~~6. Road construction shall not occur except as deemed necessary in crucial deer, elk and antelope wintering areas. Off road travel shall not be allowed within crucial areas during winter periods.~~

7. Intensive recreational developments shall not locate within sensitive crucial habitat areas.

8. Habitat of all species indicated as endangered, threatened or vulnerable shall be preserved. Nesting sites of endangered bird species shall be protected and buffered from conflicting uses.

9. The County shall within 120 days of the adoption of Ordinance No. 124(5/27/93), review and revise, if necessary, the analysis of the economic, social, environmental and energy (ESEE) consequences of protecting the inventoried bald eagle, golden eagle, prairie falcon nest areas; the inventoried bald eagle roost areas; the sage grouse lek areas submitted by ODFW and to complete the Goal 5 process.

The following two statements or policies were also included as part of Ordinance No. 124. It is unclear if there is any validity to them.

Section 2 - Crook County hereby adopts an Interim Protection Policy for the ODFW Inventory of Sensitive Bird Habitat Areas and in compliance with Statewide Planning Goal 5. These sites are attached hereto as Exhibit "A" and are adopted by this reference and incorporated herein, and are subject to the Sensitive Bird Habitat Combining Zone.

Section 3 - Crook County hereby adopts a Comprehensive Plan Policy to allow a maximum of one hundred and twenty (120) days from the date of this adoption to allow Crook County and the Oregon Department of Fish and Wildlife (ODFW) to review, and amend if necessary, the Goal 5 inventory of bald eagle roosts and sage grouse lek sites submitted by ODFW, and to complete the required Goal 5 program. These sites are attached as Exhibit "A" to the Sensitive Bird Habitat Verification of Inventory Ordinance.

**BIG GAME POLICIES**

1. Quality Winter Range is critically important to the survival of Big Game species and should to be protected from conflicting uses.

2. The county's existing settlement pattern make is reasonable to identify the presence of two wildlife sub areas – the West County Winter Range and the Greater County Winter Range.

3. The county shall recognize that although impacted by the presence of development occurring since acknowledgment of the comprehensive plan, the West County Winter Range continues to provide valuable Winter Range for Mule Deer.

4. The county shall recognize that, due to the presence of development, the habitat quality of the West County Winter Rangehas been diminished..

5. The county shall recognize that the undeveloped nature of the Greater County Winter Range provides outstanding habitat for Big Game Species.

6. The county shall recognize that the presence of large amounts of outstanding Winter Range make it more important to apply land use safeguards to the Greater County Winter Range than to the West County Winter Range.

7. The county shall adopt Overlay Zoning Districts to guide land uses in the subject areas.

8. The Overlay Districts will specify minimum parcel sizes, residential densities and other considerations necessary to protect Big Game Winter Range.

9. The County shall update the Big Game Winter Range Program not later than every ten years. The Big Game Winter Range Program update shall begin not later than eight years following county court adoption of the most recent plan revisions and be complete within a 24 month time period.

10. The county shall continue to investigate non-regulatory techniques for protecting Big Game Winter Range.

**Appendix XYZ**

# Crook County Big Game Winter Range Program

Crook County is a large territory, covering some 1,911,680 acres, most of which is used by wildlife in general and big game in particular. Mule Deer and Rocky Mountain Elk are the most abundant and are distributed throughout the County. Pronghorn antelope, while common, are neither as numerous, nor as widely distributed and are found primarily in the rural rangelands east of the city of Prineville. While the entire range of habitats used by big game throughout the year are important, the lower elevation winter ranges are particularly critical. Winter range provides the area and resources big game need to survive winter conditions present in Crook County. In Crook County much of the lower elevation land is privately owned and is subject to modification from human development. The Oregon Department of Fish and Wildlife (ODFW) has identified Mule Deer, Pronghorn Antelope, and Rocky Mountain Elk winter range as needing protection under Goal 5

The County has chosen to divide the identified big game winter range into two different planning areas to better reflect the pattern of human development and the relative importance of the habitat. The first sub-area, referred to as the West County Winter Range (WCWR) has received a greater level of development, which constrains its ability to function as Winter Range. Despite these impacts, the area continues to provide some value to big game as winter range. The second sub-area is referred to as the Greater County Winter Range (GCWR). This area includes a majority of the county's land but a fraction of its population and development. The relatively intact nature of the GCWR makes it particularly valuable for wildlife and deserving of a greater level of protection.

## I. West County Winter Range

The West County Winter Range is home to 90% of the County's residents and includes the Lone Pine and Powell Butte Areas, lands adjoining the city of Prineville, and lands running south towards Hwy 22 between Millican Road and the Crooked River Hwy. The WCWR is generally characterized by open, irrigated farmland and dry rangeland. The area is bisected by Highways 26 and 126 running east-west, and multiple high voltage power transmission lines running north to south. Ten miles of natural gas line and 16-miles of the city of Prineville short-line railroad are also present. In the southern portion of the Planning Area the Bureau of Land Management (BLM) has established an expansive ATV staging area and trail network, which ODFW believes has significantly and adversely impacted mule deer and antelope winter range. The county's first approved wind power project is located in the southern end of the Planning Area. This portion of the county has also received a significant share of demand for rural residential housing opportunities, resulting in several rural residential, non-resource districts and Destination Resort development. A large rural residential area often referred to as "Juniper Canyon" is present south of Prineville. Separate from and south of Juniper Canyon are lands known as "Juniper Acres", a former sheep ranch that was divided into hundreds of 10-acre lots prior to adoption of the county's Comprehensive Plan. Despite being almost entirely isolated from county services, no road

maintenance and an absence of conventional telephone service and ground water for domestic wells over 150 homes have been approved and many people make Juniper Acres their home. Attachment A describes and characterizes features and extent of development in the WCWR and the GCWR.

All three species of big game are present, however, due to the impacted nature of the WCWR, and the areas natural features, only Mule Deer winter range has been recommended as a priority for protection by ODFW. Fifty-four percent of the 281,031 acres in the WCWR have been identified by the Oregon Department of Fish and Wildlife (ODFW) as Mule Deer winter range. The management units ODFW uses as geographic divisions to describe wildlife populations and set hunting regulations do not correspond with County boundaries. In general, the Grizzly, Ochoco, and Paulina wildlife management units contribute 22%, 18%, and 60% of the WCWR land base, respectively. The majority of the Grizzly Unit (Unit 38) is located in Jefferson County and is in private ownership, but there is some public land present in scatted tracts and a block of dry land managed by the federal government within the WCWR. Lands in the Range lying south of Hwy 26 and east of the Crooked River Hwy are in the Ochoco Unit (Unit 37). These lands are comprised of public and private ownerships. The majority of the WCWR lies south of Hwy 126 and west of the Crooked River Hwy in the Paulina Unit (Unit 35). The Paulina Unit includes lands in Deschutes, Crook, Klamath and Lake Counties. The Crook County portion of this Unit is mostly comprised of BLM administered public lands with some scattered private lands.

ODFW has developed big game management plans which establish population management objectives (MO's) for each of the wildlife units that comprise the WCWR. Population management objectives are goals established through a public process to help guide ODFW's management decisions. MO's are shaped by three primary factors: 1) the habitat's ability to support big game populations, 2) the social desire of hunters and other wildlife enthusiast to see and pursue these species, and 3) the need to minimize agricultural damage. Mule Deer populations are below ODFW Management Objectives for the three game management units comprising the WCWR (see Table 1).

Table 1.

| | **Mule Deer Plan** | **2012** | |
|---|---|---|---|
| **Management Unit** | **Management Objective** | **Population Estimate** | **Population as % of MO** |
| Grizzly (38) | 8,500 | 6,800 | 80% |
| Ochoco (37) | 20,500 | 15,400 | 75% |
| Paulina (35) | 16,500 | 10,300 | 62% |

## II. Greater County Winter Range

This region includes the majority of the county's land base. Although the geographic territory is large only a small percent of the county's citizens reside within these boundaries. Mule Deer and Pronghorn Antelope and Rocky Mountain Elk (collectively referred to here as "Big Game" for purposes of the GCWR) are the species of interest in this Range, which includes a total of about 1,630,600 acres. About 83% of these lands are identified by the Oregon Department of Fish and Wildlife (ODFW) as big game winter range.

The GCWR is characterized by open, largely interrupted landscapes that support most of the county's natural resource base. Only about 10% of the total county population resides here. As compared to the West County Impacted Big Game Winter Range, there is no destination resort development, urban growth boundaries or rural residential areas. Major infrastructure features like power or natural gas transmission lines are only marginally present. Commercial scale farming, ranching and forestry uses along with recreation tend to be the most common land use activities.

This Winter Range falls into three general landscape types. Lands in the westernmost portion of the area tend to be a combination of cultivated farmland and juniper woodlands. These lands are nearest to the city of Prineville and are mostly under private ownership. To the extent that development is present in the GCWR, it is most common in this area. EFU-2 is the predominate zoning district

Those lands located north of Township 15 and east of the EFU-2 zoning district are almost entirely zoned for forest uses under statewide planning goal 4. Public lands included in the Ochoco National Forest comprise much of this portion of the planning area. The terrain here often includes rolling to steep timbered slopes interspersed with creek bottoms and broad prairies. F-1 is the predominant zoning district. Although these lands have very little settlement, high quality recreation opportunities on the public forest draw visitation from central Oregon population centers and the rest of the state. State Highway 26 running from Prineville through Grant County offers excellent access to this portion of the county.

Lands included in and lying south of Township 15 are primarily characterized by large tracts of public and private rangeland. Managed pasture, meadowland and irrigated hay production are also present, as are the Maury Mountains. Hwy 380 is the principle transportation facility. The rural communities of Post and Paulina are the principal service centers. Neither community is incorporated. Post consists primarily of a general store and post office. Paulina also includes a general store and post office, as well as an elementary school, a few homes and the Paulina Rodeo Grounds. Information from the 2010 United States Census based on zip code data showed that the Post and Paulina Areas had a combined population of just 187 residents. This area is primarily zoned EFU-1 although most all of the Maury Mountains are part of the Ochoco National Forest and are zoned F-1.

The WCWR also includes portions of the Grizzly, Ochoco, and Paulina wildlife management units. In addition, portions of the Maury (Unit 36) and Silvies (Unit 72) wildlife management units are also included. Together these five units make up 14%, 37%, 1%, 36% and 12% of the GCWR land base, respectively.

The majority of the Grizzly Unit is located in Jefferson County, however, that portion of the unit located in the WCWR is mostly included in the Ochoco National Forest. Lands in the Range lying east of Hwy 26 and north of Hwy 380 are in the Ochoco Unit (Unit 37). These lands are comprised of private and public ownership with the majority included in the Ochoco National Forest. The Paulina Unit is present south of Prineville Reservoir but makes up at less than 1% of the GCWR and may not be statistically insignificant. The Maury Unit is located south of Hwy 380 and is made up of a combination of National

Forest, BLM and private lands. Finally, the Silvies unit is found in the county's south east corner and is also characterized by large blocks of public and private rangeland.

ODFW management objectives and population estimates for Mule Deer and Rocky Mountain Elk in wildlife management units included in the GCWR are shown as follows.

Table 2.

| | Mule Deer Plan | 2012 | |
|---|---|---|---|
| **Management Unit** | **Management Objective** | **Population Estimate** | **Population as % of MO** |
| Grizzly (38) | 8,500 | 6,800 | 80% |
| Ochoco (37) | 20,500 | 15,400 | 75% |
| Paulina (35) | 16,500 | 10,300 | 62% |
| Maury (36) | 5,200 | 4,297 | 83% |
| Silvies (72) | 12,000 | 8,700 | 73% |

Table 3.

| | Rocky Mountain Elk | 2012 | |
|---|---|---|---|
| **Management Unit** | **Management Objective** | **Population Estimate** | **Percent of MO** |
| Grizzly (38) | 1,500 | 1,300 | 87% |
| Ochoco (37) | 4,600 | 4,032 | 88% |
| Paulina (35) | 1,600* | 1,500 | 94% |
| Maury (36) | 1,400 | 1,000 | 71% |
| Silvies (72) | 2,200 | 2,700 | 123% |

As shown above, all wildlife units are well below MO's for mule deer. Rocky Mountain Elk have stronger numbers in relationship to MO's but only the Silvies unit has met or exceeded the target population.

## III. Goal 5 Process

Because the county has chosen to establish two subareas of Big Game Winter Range every effort has been made to avoid redundancy and rely on the same information for consideration of both the WCWR and the GCWR. In order to reduce duplication of effort, subsection a. & b. and portions of subsection c. below have been written to apply to both areas.

However, in some cases it has been necessary to conduct separate assessments to reflect the relative value and possible threats to the WCWR and the GCWR. For these reasons, separated ESEE conclusions and different programs to achieve the goal of protecting the winter range resource have been developed.

a. Determination of Significance

The County has elected to utilize the Safe Harbor method for determining significance authorized at OAR 660-023-0110(4)(e), which reads as follows:

> "(e) The area is identified and mapped by ODFW as habitat for a wildlife species of concern and/or as a habitat of concern (e.g., WCWR and migration corridors, golden eagle and prairie falcon nest sites, or pigeon springs)."

In 2011, ODFW used big game location data collected during surveys, radio-telemetry studies, and local knowledge to produce updated maps that defined mule deer, Rocky Mountain Elk, and pronghorn antelope winter range. In collaboration with Crook County, these species specific maps have been digitized and incorporated into a general map of the County's important winter range. The County finds that the mapping products furnished by ODFW are sufficient to comply with the applicable rule provisions and will be relied on for identifying significant Big Game Winter Range (see Figures 1-3). The County and ODFW have also worked together to produce a map and written description of the WCWR and GCWR boundaries (see attachment XX for legal description). The impacted boundary includes the most heavily developed lands, whose value to wildlife has already been degraded in the WCWR. Through this mechanism the County could focus development efforts in previously degraded habitat, and encourage conservation in the GCWR.

b. Conflicting Uses

Big Game Winter Range is susceptible to a variety of land use activities that degrade the resource by:

- Fragmenting habitat
- Physically reducing the amount of available habitat
- Reducing the effectiveness of big game habitat by increasing human disturbance
- Increasing the spread of wildlife diseases through inappropriate feeding in residential areas
- Causing direct morality through predation by dogs, vehicle collisions, illegal harvest, and capture and injuries from fencing.

Because of the far ranging possibilities to degrade the habitat resource, the County concludes that most uses ordinarily allowed by the county zoning ordinance, either outright or conditionally, constitute a conflicting use.

Agriculture practices, including farming, grazing, and forestry have the potential to negatively affect winter range habitat, especially if done improperly or in violation of other state or county rules and regulations. Under some circumstances, however, agricultural activities can improve habitat for big game. Logging, for example, can allow sunlight to reach the previously shaded forest floor, which produces forage critical to deer and elk. Maintaining lands in resource zoning for agricultural purposes is often preferable, from a habitat conservation perspective, when compared to other land uses, such as industrial or residential development. Additionally, agricultural production is the primary economic and social feature of Crook County. For these reasons, agricultural practices are recognized as potentially

conflicting uses, but are allowed outright without modification, provided they comply with other County and State regulations.

Two general categories, Residential and Nonresidential, have been established for purposes of analyzing other potentially conflicting uses. Nonresidential uses are further divided into three (3) sub-categories.

Residential Uses – Residential uses are considered to be a one single-family dwelling and accessory structures on a single lot or parcel. Accessory farm dwellings and temporary hardship dwellings are also considered residential uses. The principle zoning districts currently applied to lands identified as significant Big Game Winter Range are either qualifying exclusive farm use zones (EFU-1, EFU-2 and EFU-3) or the F-1 district that applies to Forest lands protected under statewide planning goal 4.

Exclusive Farm Use zoning currently limits future residential development in most of the Planning Areas. Under the legal provisions found in state law and county code opportunities for both farm related and nonfarm related dwellings are available. Based on state law, farm dwellings are not generally available for properties less than 160-acres in size, which provides a built in habitat protection for resource lands.

Nonfarm related dwellings fall into two categories: 1) "Lot-of-Record", which represents a sort of grandfather opportunity subject to the provisions in ORS 215.705. The Lot-of –Record dwelling opportunity is specific to property owners who acquired the subject tract prior to January 1, 1985. 2) Non-Farm dwellings subject to the provisions at ORS 215.284, which among other things require that at least a portion of the subject parcel is generally unsuitable for agriculture and that the presence of a new home will not prove damaging to nearby farming and ranching operations. Nonfarm dwellings are generally available for existing parcels created prior to January 1, 1993, or through the creation of new parcels pursuant to ORS 215.263. New parcels specifically created for new nonfarm dwellings must pass a rigorous set of legal tests, and must be divided from an existing parcel that was created after July 1, 2001. Therefore, each land division activity, either farm or non-farm related, occurring since July 1, 2001 further reduces the number of properties that are eligible for non-farm dwelling partitions and new non-farm dwelling development. Both types of nonfarm related dwellings are commonly approved on parcels much smaller than 160-acres.

According to Farm & Forest Reports made available from the Oregon Department of Land Conservation and Development (DLCD), Crook County approved a total of 151 farm related dwellings between 1987 and 2009. In that time Crook County approved 151 farm and 669 non-farm dwellings, or an average of about 36 new dwellings per year. Not all of these dwellings affected big game habitat. Some likely occurred outside of winter range, others may not have been built, and many likely occurred in existing subdivisions, primarily Juniper Acres and Riverside Ranch.

The number of land divisions in the exclusive farm use zones and high levels of real estate sales over the past decade have caused a significant amount of attrition in the number of parcels eligible for nonfarm related residences. In other words, parcels eligible for nonfarm dwellings or related land divisions are becoming scarcer. Furthermore, the number of properties not developed with a single-family dwelling and acquired by their present owner prior to January 1, 1985 is, or should be, becoming scarcer. The

results should be that fewer nonfarm related dwellings will be approved during the next 20 year planning horizon.

Dwellings on forestland are subject to the provisions of OAR 660-006-0027. Large-tracts of at least 240 acres are eligible for a single family dwelling. Dwellings may be approved on smaller tracts if the area is already impacted by the presence of dwellings on other lots or parcels or if the current owner acquired the property prior to January 1, 1985. Because much of the county's forest land is either publicly owned or very remote and distant from public services very little development pressure has been focused on these areas. The 2008-2009 Farm & Forest Report prepared by DLCD shows that Crook County approved just three dwellings in the forest zone between 1999 and 2009.

Future conversions from EFU or Forest zoning to allow for greater residential densities are proposed from time to time in Crook County. In these instances the requested residential densities are usually 10-20 acres per single-family dwelling. The county recognizes that although lands that are not necessary to protect under statewide planning goals 3 or 4 can offer important winter range to big game. Even low productivity soils can hold vegetation, such as sage brush and antelope bitterbrush, which is important winter forage for Mule Deer, Rocky Mountain Elk and Pronghorn Antelope.

Nonresidential Uses – Nonresidential uses include those listed at ORS 215.283(1), (2) and (4), as well as OAR 660-006-0025 and other similar uses that do not establish a single-family dwelling, but still require a land use permit. Examples of prominent nonresidential uses currently present include aggregate quarries, roads, public and private airstrips and power transmission lines.

DLCD's Farm& Forest Report for 2008-09 shows that between 2002 and 2009 an average of approximately 236 "other" uses were approved statewide on lands zoned for exclusive farm use. Many of the uses were listed in the "accessory use" category, suggesting that they were approved in conjunction with a legally established dwelling. Although county by county information was not available this equals approximately 6.5 approvals per county over the eight year time period.

Three scales of nonresidential uses are described below and are based on two criteria, the amount of land they would occupy and the amount of traffic they would generate. County Assessors generally) assign one acre for the development footprint of a home on rural land. It is assumed that in most cases the residence, related out buildings, well, septic tank and drain field will be contained within one-acre. Traffic levels are an indication of human activity and human presence. Most modern traffic models assign 10 vehicle trips per day to a single-family dwelling.

Small Scale Uses – Affect less than 5 acres and result in fewer than 50 new vehicle trips per day on average. These uses are expected to occupy something less than five times the ordinary development footprint and create 5 times the traffic compared to a single-family residence. Individual small scale uses will likely have the fewest impacts on natural resources. The county anticipates that most home based occupations, commercial activities in conjunction with farm use and other similar activities would be appropriately considered small scale uses.

Medium Scale Uses – Affect 5-20 acres or generate between 50 and 200 new vehicle trips per day on average. These uses are expected to occupy something between 5 and 20 times the ordinary development footprint or create 5 to 20 times more traffic compared to a single-family residence. Medium scale uses have a greater potential to impact natural resources than small scale or residential uses. Most infrastructure & public facility, transportation, commercial and industrial, and energy related uses would rightfully belong in this category.

Large Scale Uses – Affect 20 or more acres or generate more than 200 new vehicle trips per day on average. These uses are expected to occupy more than 20 times the ordinary development footprint and create more than 20 times the traffic compared to a single-family residence. Single large scale uses have the greatest potential to impact natural resources. Many infrastructure & public facility, transportation, commercial and industrial, and energy related uses belong in this category

Other – Uses that are not currently allowed by the county's planning program are not considered as part of this analysis. However, before a new type of use or activity is added to a zoning district that applies to lands protected as significant Big Game Winter Range under statewide planning goal 5 a determination must be made as to whether the newly proposed use has the potential to be in conflict with the resource and, if so, whether it should be fully allowed, partially allowed or prohibited in habitat areas.

c. ESEE Analysis

The county is obligated to consider the positive and negative Economic, Social, Environmental and Energy consequences of allowing, limiting or prohibiting conflicting uses. For the purposes of this document, Crook County has chosen the following categories to rank possible policy choices and refine this analysis.

Minimal – There will be no, or limited consequences. Any negative consequences are acceptable.

Moderate – There are likely to be consequences. Negative consequences should be mitigated.

Significant – There will be consequences. Negative consequences shall be mitigated or avoided entirely.

A. Economic

Big game herds make significant contributions to national, state, regional and local economies. Six percent of the US population hunted in 2011 contributing $31.5 billion to the national economy, and 30% of the population spent $50.35 billion viewing wildlife. A similar report commissioned by ODFW and Travel Oregon estimated 282,000 hunters contributed half a billion dollars to Oregon's economy and 1.7 million wildlife viewers spent 1 billion dollars in 2008 (Dean Runyan and Associates 2008). In Central Oregon (Crook, Deschutes, Jefferson and Southern Wasco Counties) hunting and wildlife viewing contributed $14.3 million and $65.5 million respectively to the regional economy. The majority of these hunters pursued big game and approximately 40% of viewing trips were related to land mammals. At a

local level, hunters contributed $3.3 million to the Crook County economy while wildlife viewing contributed $6.8 million (Table 4).

Table 4.

| | Travel Related Hunting Expenditures | Local Hunting Expenditures | Travel Related Wildlife Viewing Expenditures | Local Wildlife Viewing Expenditures |
|---|---|---|---|---|
| **Central Travel Region** | $11,400,000 | $2,900,000 | $63,600,000 | $1,900,000 |
| **Crook County** | $2,584,000 | $683,000 | $6,789,000 | $218,000 |

These figures show that wildlife creates important revenue sources for Crook County and the Central Travel Region, however, big game also have the ability to cause significant agricultural damage. The 1997 Oregon Wildlife Damage Survey (Oregon Department of Agriculture, 2008) randomly sampled 6,000 farm and ranch operators between July and September 1998. Damages inflicted by wildlife cost Oregon's farmers and ranchers $214 million (2012 adjusted dollars). Ninety-three percent of this damage was to crops and livestock production. In Crook County between 2006 and 2011, ODFW received an average of 48 deer and elk complaints annually, resulting in an average known yearly loss of $158,405. These figures underestimate the true damage and only represent operators that reported.

Land owners have a number of tools available to address these issues. Oregon's Land Owner Preference program gives landowners access to controlled tags to hunt big game on their property (ORS 496.146), which can be effectively doubled through ODFW's LOP Damage Program. Some landowners have created an additional revenue stream to compensate for livestock and crop loss by charging access fees to willing hunters.

Energy projects require substantial capital investments and can generate both taxes and jobs. Energy generation facilities come in different types and have different land needs. However, all disciplines of energy production require three fundamental things: 1) Land to establish the facility; 2) Access to the resource; and 3) Access to transmission facilities with capacity to carry their product to the market. The other thing all power projects have in common is that they are expensive and often require an offset to make them fiscally possible.

Table 5.

| Energy Production Type | Common Land Needs | Common Power Output | Common Employment | General Cost of Development |
|---|---|---|---|---|
| **Natural Gas** | 20-25 Acres | 500 MW +/- | 15-25 | $1 Million/MW |
| **BioMass** | 25-35 Acres | 25-35 MW | 15-25 on site | $ 3 Million/MW |
| **Wind** | Wide Distribution | 100 MW + | One per 10 MW | $2 Million/MW |
| **Solar** | 7-10 Acres/MW | 1-12 MW | One per project | $4-5 Million/MW |

The information in Table 5. has been gathered from an assessment of existing and proposed facilities inside of Oregon. Among other things, Table 5. illustrates that energy production, particularly renewable energy production, generally has high land and capital investment requirements but provides little direct employment. The high value of production facilities has potential to add significantly to state and local tax rolls. Tax abatement is often a form of public subsidy offered to energy development companies. The table above does not account for the facility construction period, which could last many months and employ hundreds from inside and outside of an area.

Table 6.

| Economic Consequences WCWR | | | |
|---|---|---|---|
| **Conflicting Use** | **Prohibited** | **Partially Allowed** | **Fully Allowed** |
| Residential | Minimal | Minimal | Minimal |
| Small Scale | Minimal | Minimal | Minimal |
| Medium Scale | Moderate | Minima | Moderate |
| Large Scale | Significant | Minimal | Significant |

Table 7.

| Economic Consequences GCWR | | | |
|---|---|---|---|
| **Conflicting Use** | **Prohibited** | **Partially Allowed** | **Fully Allowed** |
| Residential | Minimal | Minimal | Minimal |
| Small Scale | Minimal | Minimal | Minimal |
| Medium Scale | Moderate | Minimal | Moderate |
| Large Scale | Significant | Minimal | Significant |

B. Social

Crook County residents appreciate wildlife. They also value open landscapes, rural lifestyles and private property rights. Hunting and viewing big game is an important part of the local culture. Beyond these general statements, measuring social values and importance in clear terms can be a challenging task. Needham and Morzillo (2010) conducted a survey of Oregonian's perceptions and values about wildlife species. The authors organized responses along a continuum from a biocentric value orientation (a nature centered approach) to an anthropocentric or use orientation (human centered utilitarian views). Their results indicated a significant difference between the regions in how residents valued wildlife, with residents of Eastern Oregon having the most anthropocentric or utilitarian view. However, even in Eastern Oregon there were as many residents that demonstrated a biocentric valuation as an anthropogenic one.

The Rocky Mountain Elk Foundation (RMEF) is probably the best known national organization that promotes wildlife and wild places. The RMEF is a conservationist organization, founded in the United

States in 1984 by four hunters from Troy, Montana with the mission of ensuring the future of elk, other wildlife, and their habitat. In support of this mission the RMEF is committed to: (1) Conserving, restoring, and enhancing natural habitats; (2) Promoting the sound management of wild, free-ranging elk, which may be hunted or otherwise enjoyed; (3) Fostering cooperation among federal, state, tribal, and private organizations and individuals in wildlife management and habitat conservation; and (4) Educating members and the public about habitat conservation, the value of hunting, hunting ethics, and wildlife management.

According to the RMEF, Oregonians count for about 16,000 of their membership, including 268 Crook County Residents. Portland State University's Center for Population Research has published 2010 population estimates showing a total statewide population of 3,844,195 and a Crook County population of 20,280. In statistical terms these numbers break down to show that about 0.42% of all Oregonians are members of the Rocky Mountain Elk Foundation. By comparison, about 1.0% of Crook County residents belong to RMEF. To put it another way, county membership in the nation's foremost big game conservation organization is nearly 240% of Oregon's statewide membership rate. This fact indicates that a strong interest in wildlife and wildlife habitat resides in Crook County.

Another way to measure the importance of Big Games herds to a local community is to evaluate the number of Big Game hunting tags acquired by its residents. The three Game Management Units partially located in the West County Impacted Planning Area are among the most popular in central and Eastern Oregon for hunting Mule Deer and Pronghorn Antelope. Nearly 12,000 first choice applicants pursue about 6,500 tags to hunt Buck Deer in the Grizzly, Ochoco and Paulina Units. Almost 3,000 first choice applicants vie for 120 tags to hunt antlered Pronghorn Antelope.

Data provided from ODFW shows that in 2011, Crook County residents received 1778 controlled hunt tags for Buck Deer. This figure represents about 8.5% of the total county population of 20,885. The table below shows how Crook County compares with the state of Oregon and other selected counties.

Table 8.

| Jurisdiction | Tags | Population | Percent of Population |
|---|---|---|---|
| Crook County | 1,778 | 20,885 | 8.5% |
| Deschutes County | 5,293 | 158,875 | 3.3% |
| Harney County | 680 | 7,375 | 9.2% |
| Multnomah County | 4,284 | 741,925 | 0.6% |
| State of Oregon | 63,997 | 3,857,625 | 1.7% |

As shown above, Crook County residents acquired controlled Buck Deer tags at five times the state average. As measured on a per capita basis, Crook County acquired controlled Buck Deer tags at a rate of 2.5 times that experienced in nearby Deschutes County and more than 14 times that experienced in Multnomah County. The low figures for the state of Oregon and Multnomah County could be partially attributable to hunters opting to pursue Black-Tail deer in western Oregon where general season tags

can be purchased over the counter. Harney County showed similar numbers with 9.2% of their overall population acquiring controlled hunt tags for Buck Deer.

The West County Winter Range includes parts of three different Game Management Units; Grizzly, Ochoco and Paulina. The ODFW numbers show that 993 of the 1778 controlled Buck Deer tags acquired by Crook County residents were for one of these three units.

Table 9.

| Game Unit | Crook County Resident Tags | Percent of Total |
|---|---|---|
| Paulina | 86 | 5% |
| Ochoco | 588 | 33% |
| Grizzly | 319 | 18% |
| All | 1778 | 100% |

The data displayed in Tables 8. & 9. illustrate two important points. First, Mule Deer are important to Crook County residents. From a hunting standpoint Crook County residents value Mule Deer far more than the state average. Second, the three Game Management Units found in the West County Impacted Planning Area are very important to Crook County deer hunters, accounting for 56% of the controlled Buck Deer tags acquired by Crook County residents in 2011. While these units offer diverse hunting opportunities for big game species, the subject territory itself is rather unremarkable for its hunting potential. However, the Winter Range provided here supports game herds that are available for hunting and viewing at different locations in different seasons.

Table 9.

| Social Consequences WCWR | | | |
|---|---|---|---|
| **Conflicting Use** | **Prohibited** | **Partially Allowed** | **Fully Allowed** |
| Residential | Significant | Minimal | Moderate |
| Small Scale | Significant | Minimal | Moderate |
| Medium Scale | Significant | Minima | Moderate |
| Large Scale | Significant | Minimal | Significant |

Table 10.

| Social Consequences GCWR | | | |
|---|---|---|---|
| Conflicting Use | **Prohibited** | **Partially Allowed** | **Fully Allowed** |
| Residential | Significant | Minimal | Moderate |
| Small Scale | Significant | Minimal | Moderate |
| Medium Scale | Significant | Minimal | Significant |
| Large Scale | Moderate | Minimal | Significant |

C. Environmental

Big game species, such as mule deer, Rocky Mountain elk, and pronghorn, play a critical role in Crook County's environment and provide numerous ecological services to the community. The dietary preferences of ungulates can have a top-down influence on the species of plants that occur in an area (Kay 2009), browsing and grazing can suppress plant growth (Kay and Bartos 2000), and big game movements play an important role in seed dispersal (Bartuszevige and Endress 2008). These interactions can cascade through an ecosystem, causing changes in the composition of bird, insect, and other communities (Martin et al. 2010). By concentrating the energy and nutrients contained in individual plants, ungulates make those resources readily available to their predators, including coyotes, bobcats, black bears, cougars, and Crook County's human hunters. The interconnected relationship between plants, ungulates and predators has been well documented in the literature (Beschta and Ripple 2009). Perhaps the most well-known example comes from the Kaibab Plateau in the early 1900's, when aggressive predator removal by the US Forest Service caused an irruption in the deer population. Eventually the deer herd exceeded the land's carrying capacity, which resulted in dramatic over-browsing and eventual population collapse (Leopold 1943, Binkley et al. 2006). More recently, the reintroduction of wolves in Yellowstone National Park has displaced elk from riparian zones causing the dramatic rehabilitation of these once over-grazed areas (Beschta and Ripple 2010).

The primary purpose of conserving winter range is to ensure that Crook County's big game species have areas where they can escape low temperatures, wind, and snow accumulations to continue providing the ecological functions and economic values described above. Seasonal migration by big game species to lower elevation winter range has been well described throughout western North America (McCullough 1964, Nicholson et al. 1997, Hyngnstrom 2008). In Crook County, ODFW has been conducting winter and spring surveys and documenting winter locations of big game since the 1960's. More recently ODFW has used radio-marked deer and elk in Crook and Deschutes Counties to further refine the movements and locations of wintering animals. Radio-marked mule deer have made annual movements of up to 80 miles to reach their winter grounds (ODFW unpublished data).

The conservation of big game winter range provides ancillary benefits to a variety of other habitats and species. The Oregon Conservation Strategy, the primary document guiding proactive voluntary conservation actions in Oregon, has identified at-risk habitats and species within the state (ODFW 2006). Many of these habitats, including aspen woodlands, bitterbrush communities, canyon shrublands, sage brush steppe, mature western juniper savannah, ponderosa pine woodlands, and grasslands, receive some protection from winter range designation. This incidental habitat protection benefits many at-risk species, including the greater sage-grouse, a candidate species for listing under the federal Endangered Species Act. One of the main threats to sage-grouse conservation, identified by the USFWS, is the lack of defined regulations protecting sage steppe habitat. Fortunately, in Crook County 95% of identified greater sage-grouse habitat receives some protection from designation as big game winter range.

Residential development negatively affects big game by removing habitat, and causing behavioral modifications such as avoidance of dwellings, transition to more nocturnal behavior, and a reduction of home range size (Vogel 1989, ODFW 1985, Happe 1982). In some circumstances, the productivity of

human landscaping and protection from predators can artificially increase big game populations (Bender et al 2004). Unfortunately, artificially inflated suburban big game populations contribute little in the way of ecological function or economic value to rural economies and can cause chronic damage problems, human safety concerns, conflict over feeding between neighbors, and increased incidence of disease (Thompson 1998, Farnsworth et al. 2005). Feeding big game, which often occurs in suburban areas, is known to contribute to the spread of disease by providing an infectious substrate (Palmer et al. 2004, Palmer and Whipple 2006). ODFW has documented a wide variety of disease in sub-urban deer populations including various fungal and bacterial diseases, severe rumenitis, Deer Hair Loss Syndrome, and Adenovirus Hemorrhagic Disease. Once established in residential herds, these diseases may more easily escape to migratory game herds. Residential development can also contribute to deer mortality by increasing the number of domestic dogs in an area. In an early track county study around development, ODFW's Deschutes County staff suggested that migratory deer and elk avoid developed areas harboring dogs. Some studies of radio-collared deer have attributed 2-3% of annual mortality to domestic dogs (Sime 1999), and others have shown that up to 67% of vehicle-deer collisions were caused by dogs chasing deer into traffic in developed areas (Bender et al. 2004).

Gucinkski et al. (2001) considered roads to be the most damaging feature to the environment in public wildlands management. Roads can provide access to poachers (Stussy 1994, and Cole 1997), disturb wildlife during the critical winter season, reduce habitat effectiveness by causing big game to avoid well-traveled areas, and cause mortality directly through collisions with vehicles (Gaines et al 2003). Gowan et al. (1989) estimated that every mile of forest road eliminated approximately 4 acres of habitat ,and an average road density of 3 linear miles per square mile reduced habitat effectiveness by 58%. Numerous authors have demonstrated clear avoidance of forest roads by elk (Rowland et al. 2000, Wisdom et al. 2004, Wisdom et al. 2005). Some of these studies, (Wisdom et al. 2004, Wisdom et al. 2005) failed to document similar avoidance of forest roads by mule deer. However, roads have other direct negative effects on deer. Torland (1976) showed that fawn mortality was reduced by 30% after a road closure program was implemented in the Tumalo area during the winter of 1972. More recently, ODFW documented 1,362 roadkill on a 100 mile stretch of Highway 97, and538 on a portion of Highway 31 between 2005 and 2010. During this same time period 17% of known mortalities among ODFW's radio-collared deer in Central Oregon were attributed to vehicular collisions (ODFW unpublished data).

Energy development in the western United States has historically involved fossil fuel extraction, and the relationship between wildlife and this form of development is well studied. Sawyer et al. (2006, 2009) examined the effect of the development of a natural gas field on mule deer in Wyoming. Mule deer were found to avoid all types of well pads, and shifted use to less preferred habitat as a response to development. The degree of avoidance was influenced by the number of vehicle trips per day, with avoidance increasing with greater disturbance. Elk have also been shown to respond to oil drilling by changing their patterns of habitat use and activity within the affected range (Van Dyke and Klein 1996). Transmission corridors are required to move the generated energy and can create a linear strip of open habitat that can provide forage for deer elk and pronghorn. These transmission lines also reduce cover, disturb wildlife by allowing access to people and vehicles, and facilitate the movement of invasive weeds

(Lees 1989). Given Crook County's approval of the West Butte Wind Farm within the WCWR, it appears likely that alternative energy development is most likely to affect big game habitat locally. Unfortunately, the effects of alternative energy development on big game are not as well understood as traditional fossil fuel extraction. In the face of this uncertainty documents guiding the development of wind facilities (Molvar 2008) recommend treating projects as research opportunities which can guide site-specific decisions about required mitigation and inform the development of future projects.

Based on the proceeding research there are a number of general guidelines that can help reduce the negative effect of human development on big game habitat. These include:

- Cluster human development to retain as much habitat as possible in a contiguous natural condition,
- Use the smallest amount of road possible to access developments or implement seasonal restrictions to limit access,
- Limit or ban the feeding of big game in suburban areas,
- Adopt or enforce ordinances that prohibit dogs from running at large,
- Prohibit the use of fencing materials that can injure, trap, or kill big game, and
- Implement effective pre and post construction surveys to learn more about the effects of development on big game as partial mitigation for large-scale projects.

Table 11.

| Environmental Consequences WCWR | | | |
|---|---|---|---|
| Conflicting Use | **Prohibited** | **Partially Allowed** | **Fully Allowed** |
| Residential | Minimal | Minimal | Moderate |
| Small Scale | Minimal | Minimal | Moderate |
| Medium Scale | Minimal | Moderate | Moderate |
| Large Scale | Minimal | Moderate | Significant |

Table 12.

| Environmental Consequences GCWR | | | |
|---|---|---|---|
| Conflicting Use | **Prohibited** | **Partially Allowed** | **Fully Allowed** |
| Residential | Minimal | Minimal | Significant |
| Small Scale | Minimal | Minimal | Significant |
| Medium Scale | Minimal | Moderate | Significant |
| Large Scale | Minimal | Significant | Significant |

D. Energy

Energy consumption by residential and non-residential uses will have limited effects on big game habitat. However, opportunities to develop energy production or transmission corridors can have a considerable effect on wildlife habitat. This analysis will, therefore, focus on the consequences of energy production.

Energy generation facilities come in different types and have different land needs. The most basic difference is whether a facility generates energy from fossil fuels like coal, oil and natural gas or a renewable resource. Most of the power used in Oregon comes from the dam projects on the Columbia River. Non-renewable sources, like natural gas also make important contributions. The state's only coal fire energy plant is located near Boardman, Oregon and is scheduled to close on or before the year 2020. Current environmental regulations make it unlikely that new coal fire plants will be permitted in the future.

Energy projects also differ in the amount of land a facility requires and how much energy can be produced. Natural gas fire plants and Biomass or Co-Generation facilities require a plant with a physically developed footprint. These facilities routinely occupy 20-25 acres and create 15-25 employment positions on site. In the case of bio-mass, off site employment can be upwards of three times of the number employed at the site. In other words, a bio-mass plant might employ 20 workers at the plant and another 70 in the woods. Both energy generation models operate as base load plants, meaning that they produce a steady supply of power as long as they are up and running. This usually means operating at name plate capacity (the amount of power that can be produced when the facility is operating at full capacity) for 24 hours a day, seven days a week. Both types of plants are also commonly sited on industrial lands, often within urban growth boundaries. Name plate capacity for Natural Gas Fire plants is often over 500 MW. Name plate capacity for Bio-Mass facilities is often 20-30 MW.

Besides Bio-Mass, at least two other types of renewable energy technology are becoming more common. Utility scale wind and solar energy generation facilities were once discounted as being cost prohibitive. Today, many utility scale wind projects have been successfully constructed in north central and eastern Oregon counties. This model involves the installation of towers with turbines in a linear fashion across a broad landscape, connected by a maintenance road and underground infrastructure. Many commercial wind power projects in Oregon have a name plate capacity of 100-104 MW, although much larger projects have been pursued and constructed. Most modern wind turbines have the capacity to generate 1.5-2.5 MW of power when operating at full capacity. Therefore, a wind project with a name plate capacity of 100 MW will generally include about 50 towers with turbines. The total amount of land occupied by this sized project will ordinarily add up to well less than one-acre per tower. So, 50 towers with a complete accompaniment of roads, lay down yards, substation, etc… will probably physically occupy 25-30 total acres. However, this occupancy is not concentrated at one location and will likely be distributed across several thousand acres. Wind facilities are not base load plants. They are estimated to be about 30% effective. If a wind facility has a name plate capacity of 100 MW the average producing may be expected to be closer to 30 MW.

Less is known about utility scale solar power production. Net metering and Feed In Tariff projects are becoming more common but are generally small projects, often established in conjunction with domestic or commercial activities within communities. Currently only a handful of projects are either completed or under construction in Oregon. Two projects have been developed by EnXco in Yamhill County. Both of these projects have been purchased by PGE to assist the company in satisfying their

obligations under Oregon's Renewable Portfolio Standards (RPS)[1]. Obsidian Renewables currently has two projects are under construction in Lake County, on near Lakeview (Black Cap) and the other near Christmas Valley (Outback). The Black Cap project is scheduled to be acquired by Pacific Power upon completion while the Outback project will be acquired by PGE. Both companies will use these projects to help meet their RPS requirements.

What has been observed from these projects and other information is that Oregon has good potential for photovoltaic solar power production (as opposed to Concentrated Thermal, or CST). Commercial photovoltaic solar projects generally require 7-10 acres of panels to produce one MW of power. Once constructed, photovoltaic solar facilities require little input. The most intensive management activity is washing the panels, which happens seasonally. Little water is required for this purpose and an onsite water supply is not necessary. Like wind, solar facilities are not base load plants. They are estimated to be about 30% effective. If a solar facility has a name plate capacity of 10 MW the average energy production may be expected to be closer to 3 MW. On a large scale, a hypothetical 5,000-acre photovoltaic solar facility operating with today's technology (2012) would have a name plate capacity of about 650 MW. However, the average output of 5,000 acres of solar panels would probably be closer to 200 MW, or about forty percent of a natural gas fire plant occupying just 20 acres of industrial land.

In 2009, the Oregon legislature passed a law that created two significant solar programs: the solar volumetric incentive rate pilot program and the solar photovoltaic capacity standard. The volumetric incentive rate (VIR) is a pilot program for small solar energy systems (ORS 757.365, OAR 860-084-0100). The program is administered by investor-owned electric utilities, with oversight from the Oregon Public Utilities Commission (PUC). It limits total enrollment to no more than 25 MW through a production-based incentive for solar facilities no greater than 500 kW in AC nameplate capacity. The program's enrollment closes on March 31, 2015. A separate provision of statute established the solar photovoltaic capacity standard (ORS 757.370). Under this standard, qualifying solar systems are solar facilities of 500 kW to 5 MW in capacity. The Public Utilities Commisssion adopted rules (OAR 860-084-0020) that require Oregon's three investor-owned utilities in Oregon to have met the following capacity standard by 2020 with qualifying solar systems:

- Portland General Electric: 10.9 megawatts
- Pacific Power: 8.7 megawatts
- Idaho Power Company: 0.5 megawatts

The "solar carve out" as this has come to be known created a market appetite for utility scale solar power that might not have otherwise been present.

[1] The 2007 Legislature created a renewable portfolio standard (RPS) that requires the largest utilities in Oregon to provide 25 percent of their retail sales of electricity from newer, clean, renewable sources of energy by 2025. Smaller utilities have similar, but lesser, obligations.

Table 13.

| Energy Consequences WCWR | | | |
|---|---|---|---|
| Conflicting Use | **Prohibited** | **Partially Allowed** | **Fully Allowed** |
| Residential | Significant | Minimal | Moderate |
| Small Scale | Significant | Minimal | Moderate |
| Medium Scale | Significant | Minima | Moderate |
| Large Scale | Significant | Minimal | Significant |

Table 14.

| Energy Consequences GCWR | | | |
|---|---|---|---|
| Conflicting Use | **Prohibited** | **Partially Allowed** | **Fully Allowed** |
| Residential | Minimal | Minimal | Moderate |
| Small Scale | Minimal | Minimal | Minimal |
| Medium Scale | Moderate | Minimal | Minimal |
| Large Scale | Significant | Minimal | Minimal |

E. ESEE Conclusions

The following tables represent the potential consequences of prohibiting, fully allowing or partially allowing conflicting uses:

Table 15.

| **Consequences of Prohibiting Conflicting Uses - WCWR** | | | | |
|---|---|---|---|---|
| Conflicting Use | **Economic** | **Social** | **Environmental** | **Energy** |
| Residential | Minimal | Significant | Minimal | Minimal |
| Small Scale | Minimal | Significant | Minimal | Minimal |
| Medium Scale | Moderate | Significant | Minimal | Moderate |
| Large Scale | Significant | Significant | Minimal | Significant |

Table 16.

| Consequences of Partially Allowing Conflicting Uses - WCWR | | | | |
|---|---|---|---|---|
| Conflicting Use | **Economic** | **Social** | **Environmental** | **Energy** |
| Residential | Minimal | Minimal | Minimal | Minimal |
| Small Scale | Minimal | Minimal | Minimal | Minimal |
| Medium Scale | Minimal | Minimal | Moderate | Minimal |
| Large Scale | Minimal | Minimal | Moderate | Minimal |

Table 17.

| Consequences of Fully Allowing Conflicting Uses - WCWR | | | | |
|---|---|---|---|---|
| Conflicting Use | **Economic** | **Social** | **Environmental** | **Energy** |
| Residential | Minimal | Moderate | Moderate | Moderate |
| Small Scale | Minimal | Moderate | Moderate | Minimal |
| Medium Scale | Moderate | Moderate | Moderate | Minimal |
| Large Scale | Significant | Significant | Significant | Minimal |

Table 18.

| Consequences of Prohibiting Conflicting Uses - GCWR | | | | |
|---|---|---|---|---|
| **Conflicting Use** | **Economic** | **Social** | **Environmental** | **Energy** |
| Residential | Minimal | Significant | Minimal | Minimal |
| Small Scale | Minimal | Significant | Minimal | Minimal |
| Medium Scale | Moderate | Significant | Minimal | Moderate |
| Large Scale | Significant | Moderate | Minimal | Significant |

Table 19.

| Consequences of Partially Allowing Conflicting Uses - GCWR | | | | |
|---|---|---|---|---|
| Conflicting Use | **Economic** | **Social** | **Environmental** | **Energy** |
| Residential | Minimal | Minimal | Minimal | Minimal |
| Small Scale | Minimal | Minimal | Minimal | Minimal |
| Medium Scale | Minimal | Minimal | Moderate | Minimal |
| Large Scale | Minimal | Minimal | Significant | Minimal |

Table 20.

| Consequences of Fully Allowing Conflicting Uses - GCWR | | | | |
|---|---|---|---|---|
| Conflicting Use | **Economic** | **Social** | **Environmental** | **Energy** |
| Residential | Minimal | Moderate | Significant | Moderate |
| Small Scale | Minimal | Moderate | Significant | Minimal |
| Medium Scale | Moderate | Significant | Significant | Minimal |
| Large Scale | Significant | Significant | Significant | Minimal |

Eighty-eight percent (14 out of 16) of the ESEE consequences considered for partially allowing conflicting uses in the WCWR are considered minimal, compared to 31% and 50% for fully allowing or prohibiting those uses.

An assessment of the ESEE consequences considered for the GCWR also shows partially allowing conflicting uses in the GCWR ranks as minimal 88% of the time. However, the significant ESEE consequences for fully allowing conflicting uses are more than double in the GCWR than the WCWR (19% v.44%)

Analyzing the economic costs and benefits of prohibiting, partially allowing, or fully allowing any given use within significant Big Game Winter Range is difficult because of the interconnected relationship between big game species, habitat, local culture, and the economy. As discussed earlier, big game species make important contributions to the local economy, but their need for habitat can potentially create direct competition with other sectors. Energy projects, for example, may contribute to the economy directly, but if they degrade habitat and decrease the ability of the land to produce game species, they may indirectly harm the economy by reducing the County's ability to attract hunters and wildlife viewers. The preceding analysis has been complicated by many such interactions, most of which are unknown. For this reason, the conclusions reached above generally take a moderate approach and partially allow anticipated uses. Hopefully this method will provide economic, social, and energy benefits to the County, while conserving habitat for big game species.

d. Program to Achieve the Goal.

Based on the analysis of potential Economic, Social, Environmental and Energy consequences the county shall enact a Program to Achieve the Goal of protecting significant Big Game Winter Range that allows conflicting uses but limits them as necessary to be in balance with the habitat resource.

The county shall adopt policies into the Crook County Comprehensive Plan that reflect the position that Big Game Winter Range is important to protect and that stronger land use safeguards are needed to apply in the GCWR than the WCWR. The county shall also adopt implementing land use ordinances for the GCWR and the WCWR to guide development and conservation in the planning areas.

WORKS CITED

Bartuszevige, A. M., and B. A. Endress. 2008. Do ungulates facilitate native and exotic plant spread? Seed dispersal by cattle, elk, and deer in northeastern Oregon. Journal of Arid Environments 72: 904-913.

Beschta, R. L. and W. J. Ripple. 2009. Large predators and trophic cascades in terrestrial ecosystems of the western United States. Biological Conservation 11:2401-2414.

Beschta, R. L. and W. J. Ripple. 2010. Recovering riparian plant communities with wolves in northern Yellowston, U.S.A. Restoration Ecology 18:380-389.

Binkley, D., M. M. Moore, W. H. Romme, and P. M. Brown. 2006. Was Aldo Leopold right about the Kiabab deer herd. Ecosystems 9:227-241.

Cole, E. K. 1997. Effects of road management on movement and survival of elk. Journal of wildlife management 61:1115-1126.

Dean Runyan and Associates. 2009. Fishing, hunting, wildlife viewing, and shellfishing in Oregon, 2008. Portland, OR 72 pp.

DLCD. 2010. 2008-09 Farm and forest report. DLCD. Salem, OR. 81 pp.

Gaines, W. L., P. H. Singleton, and R. C. Ross. 2003. Assessing the cumulative effects of linear recreation routes on wildlife habitat on the Okanonogan and Wenatchee National Forests. US Department of Agriculture, Forest Service, General Technical Report PNW-GTR-586, Portland, Oregon

Gowan, D. M., G. Silovsky, and D. C. Carleson. 1989. An evaluation of elk habitat management on the Malheur, Umatilla, and Wallowa Whitman National Forests and Recommended Actions. Oregon Department of Fish and Wildlife.

Gucinski, H., M. H. Brooks, M. J. Furniss, and R. R. Ziemer. 2001. Forest roads: a synthesis of scientific information. U.S. Department of Agriculture, Forest Service, General Technical Report PNW-GTR-509, Portland, Oregon

Farnsworth, M. L., L. L. Wolfe, N. Thompson Hobbs, K. P. Burnham, E. S. Williams, D. M. Theobald, M. M. Conner, and M. W. Miller. 2005. Human land use influences chronic wasting disease prevalence in mule deer. Ecological Applications 15: 119-126

Hyngstrom, S. E. 2008. Literature review of mule deer and white-tailed deer in western and mid-western landscapes. Great Plains Research 18:219-231.

Kay, C. E. 2009. Long-term aspen exclosures in the Yellowstone ecosystem. Pp 225-240 in Sustaining Aspens in Western Landscapes: Symposium Proceedings: USDA Forest Service Rocky Mountain Research Station Proceedings RMRS-P-18 May 2001 Fort Colins Colorado

Kay, C. E. and D. L. Bartos. 2000. Ungulate herbivory on Utah aspen: assessment of long-term exclosures. Journal of Range Management 53:145-153.

Lees, A.T. 1989. The effect of recreational activity on elk use and distribution along a pipeline right-of-way. Pages 133-143 *In* Proc. IV: Issues and Technology in the Management of Impacted Wildlife. Thorne Ecological Institute, Glenwood Springs, Colorado. 213 pp. Leopold, A. 1943. Deer irruptions. Wisconsin Conservation Bulletin 8:3-11

Martin, J. L., A. J. Gaston, S. Allombert, and S. A. Stockton. 2010. Top-down and bottom-up consequences of unchecked ungulate browsing on plant and animal diversity in temperate forests: lessons from a deer introduction. Biological invasions 12: 353-371.

McCullough, D. R. 1964. Relationship of weather to movements of black-tailed deer. Ecology 45:249-256.

Needham, M. D., & Morzillo, A. T. (2011). *Landowner incentives and tolerances for managing beaver impacts in Oregon.* Final project report for Oregon Department of Fish and Wildlife (ODFW) and Oregon Watershed Enhancement Board (OWEB). Corvallis, OR: Oregon State University, Department of Forest Ecosystems and Society.

Nicholson, M. C. 1997. Habitat selection and survival of mule deer tradeoffs associated with migration. Journal of Mammalogy 78:483-504.

Oregon Department of Agriculture. 1998. Wildlife damage to Oregon agriculture 1997 survey summary. Oregon Department of Agriculture. Salem, OR. 35 pp.

Palmer, M. V., W. R. Waters, and D. L. Whipple. 2004. Shared feed as a means of deer-to-deer transmission of Mycobacterium bovis. Journal of Wildlife Disease 40:87-91.

Palmer, M. V., and D. L. Whipple. 2006. Survival of Mycobacteriuma bovis on feedstuffs commonly used as supplemental feed for white-tailed deer (Odocoileus virginianus). Journal of Wildlife Disease 42: 853-858.

Rowland, M. M., M. J. Wisdom, B. K. Johnson, and J. G. Kie. 2000. Elk distribution and modeling in relation to roads. Journal of Wildlife Management 64: 672-684.

Stussy, R. J. 1994. Survival of resident and translocated female elk in the Cascade Mountains of Oregon. Wildlife Society Bulletin 22: 242-247.

Torland, J. T. 1976. Tumalo Road Closure. Central Region Administrative Report. Number 76-2. 23 pp.

U.S. Fish and Wildlife Service (USFWS). 2012. 2011 National survey of fishing, hunting, and wildlife-associated recreation: national overview. 19 pp

Van Dyke, F. and W. C. Klein. 1996. Response of elk to installation of oil wells. Journal of Mammalogy 77:1028-1041.

Wisdom, M. J., N. J. Cimon, B. K. Johnson, E. O. Garton, and J. W. Thomas. 2005. Spatial Partitioning by Mule Deer and Elk in Relation to Traffic. Pages 53-66 in Wisdom, M. J., technical editor, The Starkey Project: a synthesis of long-term studies of elk and mule deer. Reprinted from the 2004 Transactions of the North American Wildlife and Natural Resources Conference, Alliance Communications Group, Lawrence, Kansas, USA.

# Chapter 18.16
# EXCLUSIVE FARM USE ZONE, EFU-1 (POST-PAULINA AREA)

Sections:



~~**18.16.081 Wildlife policy applicability.**~~

~~All new nonfarm dwellings on existing parcels within the deer and elk winter ranges must meet the residential density limitations found in Wildlife Policy 2 of the Crook County comprehensive plan. Compliance with the residential density limitations may be demonstrated by calculating a one-mile radius (or 2,000-acre) study area. An applicant may use a different study area size or shape to demonstrate compliance with Wildlife Policy 2 provided the methodology and size of the study area are explained and are found to be consistent with the purpose of Crook County comprehensive plan Wildlife Policy 2. (Ord. 236 § 1 (Exh. A), 2010)~~

**18.16.081 West County Winter Range**

For land use proposals on significant Mule Deer Winter Range located in the West County Winter Range the following requirements shall apply in addition to all other applicable provisions of law;

(1) Non-Farm Dwelling Parcels: Division of land for nonfarm purposes may be allowed pursuant to all applicable local and state provisions and provided that the requirements of 18.20.081(2) are satisfied.

(2) Single family dwellings and their accessory uses may be approved under the following circumstances:

(a) The dwelling is located on a lot or parcel that is at least 160-acres.

(b) The dwelling is located on a lot or parcel less than 160-acres but at least 80-acres; and

(A) The dwelling footprint, including decks and porches, shall be located entirely within 300 feet of public roads, private roads, or recorded easements for vehicular access as of September XX, 2012, unless it can be found that:

(i) The siting within 300 feet of such roads or easements for vehicular access would force the dwelling to be located on irrigated land, in which case, the dwelling shall be located to provide the least possible impact on wildlife habitat considering browse, forage, cover, access to water and migration corridors, and minimizing length of new access roads and driveways; or,

(ii) The dwelling is setback no more than 50' from the edge of a driveway that existed before September XX, 2012.

(c) The dwelling is located on a lot or parcel less than 80-acres provided that:

(i) The provisions of 18.20.081(2)(b) are satisfied; and

(ii) Residential density does not exceed one dwelling per 40-acres within a defined study area established pursuant to OAR 660-033-0130(4)(a)(D)(i) and further described below in CCC18.16.083 (see below); and;

(d) New accessory or temporary hardship dwellings proposed in conjunction with existing dwelling may be approved if located within 300 feet of an existing residence.

(3) Small Scale Uses as described in the comprehensive plan may be approved when:

(a) Located within 300 feet of public roads, private roads or recorded easements for vehicular access as of September XX, 2012, or;

(b) The siting within 300 feet of such roads or easements for vehicular access would force the dwelling to be located on irrigated land, in which case, the dwelling shall be located to provide the least possible impact on wildlife habitat considering browse, forage, cover, access to water and migration corridors, and minimizing length of new access roads and driveways.

(4) Medium Scale Uses as described in the comprehensive plan may be approved when:

(a) Developed consistent with a habitat mitigation plan approved by the county. For purposes of Medium Scale uses the habitat mitigation plan should include detailed information regarding site specific conditions, intensity of use and clear mitigation strategies and shall be attached as conditions of approval in the county decision.

(5) Large Scale Uses as described in the comprehensive plan may be approved when:

(a) Developed consistent with a habitat mitigation plan approved by the county that shall include pre- and post-construction big game surveys on the site and a control area to guide mitigation and inform future decisions. For purposes of Large Scale uses the habitat mitigation plan shall be prepared by a professional biologist (with a minimum of a B.S. degree in biology or similar scientific field and 2 years of professional experience) using professionally accepted methodologies. The mitigation plan shall be attached as conditions of approval in the county decision.

**8.16.082 Greater County Winter Range**

For land use proposals on significant Big Game Winter Range located in the Greater County Winter Range, but not included in the Paulina Ranches Subdivision and Riverside Ranches Units 1, 2, and 3, the following requirements shall apply in addition to all other applicable provisions of law. For purposes of this section Big Game refers to Mule Deer, Pronghorn Antelope and Rocky Mountain Elk.

(1) Non-Farm Dwelling Parcels: Division of land for nonfarm purposes may be allowed pursuant to all applicable local and state provisions and provided that the requirements of 18.20.082(2) are satisfied.

(2) Single family dwellings and their accessory uses may be approved under the following circumstances:

(a) The dwelling is located on a lot or parcel that is at least 320-acres.

(b) The dwelling is located on a lot or parcel less than 320-acres but at least 160-acres; and

(A) The dwelling footprint, including decks and porches, shall be located entirely within 300 feet of public roads, private roads, or recorded easements for vehicular access as of September XX, 2012, unless it can be found that:

(i) The siting within 300 feet of such roads or easements for vehicular access would force the dwelling to be located on irrigated land, in which case, the dwelling shall be located to provide the least possible impact on wildlife habitat considering browse, forage,

cover, access to water and migration corridors, and minimizing length of new access roads and driveways; or,

(ii) The dwelling is setback no more than 50' from the edge of a driveway that existed before September XX, 2012.

(c) The dwelling is located on a lot or parcel less than 160-acres provided that:

(i) The provisions of 18.20.081(2)(b) are satisfied; and

(ii) Residential density does not exceed one dwelling per 160-acres within a defined study area established pursuant to OAR 660-033-0130(4)(a)(D)(i) and further described below in CCC18.16.083 (see below); and;

(d) New accessory or temporary hardship dwellings proposed in conjunction with existing dwelling may be approved if located within 300 feet of an existing residence.

(3) Small Scale Uses as described in the comprehensive plan may be approved when:

(a) Located within 300 feet of public roads, private roads or recorded easements for vehicular access as of September XX, 2012, or;

(b) The siting within 300 feet of such roads or easements for vehicular access would force the dwelling to be located on irrigated land, in which case, the dwelling shall be located to provide the least possible impact on wildlife habitat considering browse, forage, cover, access to water and migration corridors, and minimizing length of new access roads and driveways.

(4) Medium Scale Uses as described in the comprehensive plan may be approved if:

(a) The county finds that the proposed activity will not seriously interfere with the surrounding area's ability to provide quality Big Game Winter Range; and

(b) Developed consistent with a habitat mitigation plan approved by the county. For purposes of Medium Scale uses the habitat mitigation plan should include detailed information regarding site specific conditions, intensity of use and clear mitigation strategies and shall be attached as conditions of approval in the county decision.

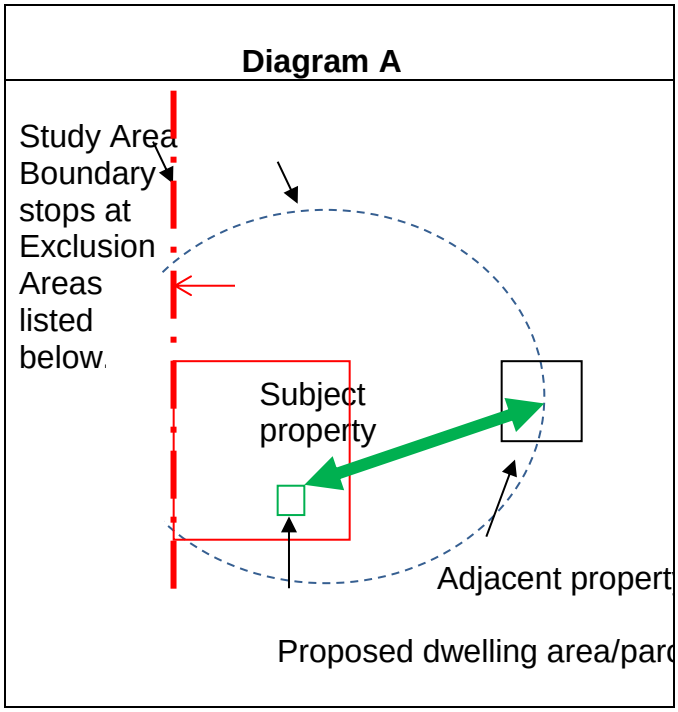
(5) Large Scale Uses as described in the comprehensive plan may be approved if:

(a) The county finds that the proposed use cannot be located outside of Big Game winter Range in the Greater County Non-Impacted Planning Area; and

(b) The county finds that the proposed activity will not seriously interfere with the surrounding area's ability to provide quality Big Game Winter Range; and

(c) Developed consistent with a habitat mitigation plan approved by the county that shall include pre- and post-construction big game surveys on the site and a control area to guide mitigation and inform future decisions. For purposes of Large Scale uses the habitat mitigation plan shall be prepared by a professional biologist (with a minimum of a B.S. degree in biology or similar scientific field and 2 years of professional experience) using professionally accepted methodologies. The mitigation plan shall be attached as conditions of approval in the county decision.

**18.16.083 Residential Density in Big Game Winter Range.**




(1) The Big Game Winter Range residential density study area shall exclude the following areas:

a. Public Lands

b. Destination Resorts;

c. City Limits;

d. Urban Growth Boundary areas;

e. Nonresource exception areas existing prior to September 1, 2012;

(2) When a property is in both the West County Winter Range and Greater County Winter Range, the property shall be regulated by the requirements of the area which it is predominantly within (51% or more).

(3) The calculation of density shall consider all potential future dwelling currently allowed under state law and county code in addition to currently existing dwellings.