

IV. WOLF-UNGULATE INTERACTIONS

This chapter focuses on current management of wild ungulate³³ species in Oregon, interactions between wolves and ungulates, and those strategies that will be used to ensure retention of recreational ungulate hunting opportunities and healthy ungulate populations.

Wolves dispersing into Oregon likely will attempt to occupy areas with abundant ungulate prey. Other carnivore species including coyotes, cougars and black bears also will be interacting with prey species, including ungulates, in the same areas. The effect of adding wolves to the mix of carnivores occupying Oregon and the influence this suite of carnivores will have on ungulates is unknown at this time. Each wolf-prey system is unique, and the presence of other carnivores and domestic livestock in addition to ungulates make predictions difficult at best. Separate management Plans exist for two other carnivores and a number of ungulate species. The state's capacity to achieve management goals for all of these species will be enhanced if the Plans are considered collectively.

Healthy and abundant prey populations will play an important role in achieving wolf conservation in Oregon. They also are important for maintaining hunting opportunities which contribute to many local economies. The status of ungulate populations and resulting hunter opportunity are significant factors in many rural communities, especially in eastern Oregon. As hunting opportunities decline, fewer hunters (many of whom reside in the western part of the state) spend money for excursions into rural Oregon. This loss of visitors and seasonal income stream can be significant for some small communities. For example, from 1995 to 2003, elk hunting opportunities for bull and antlerless elk have declined by 6,750 permits in Wallowa County. The challenge for wildlife managers will be to maintain or improve ungulate populations capable of supporting wolves and other carnivores while maintaining hunting opportunities for the public.

Hunters, along with private landowners and conservation organizations, have been at the forefront of supporting and financing wildlife conservation in Oregon. Through hunting license and tag fee revenues, important wildlife conservation and management activities are made possible in the state.

The effect of wolves on prey populations in Oregon is the subject of many questions and much debate among members of the public. Many Oregonians have expressed concern over the prospect of adding another carnivore to the suite of carnivores that currently exist in the state. Specifically, deer and elk hunters voiced concern for ungulate populations in some areas of eastern Oregon that are experiencing low calf elk and fawn mule deer survival. In some wildlife management units, hunter opportunity has declined significantly in recent years as biologists reduce hunting tag numbers to counteract the low survival of ungulate young and decreased populations.

Much of the concern about wolves expressed by the hunting community may be related to the popular belief that current carnivore populations (coyotes, cougars and black bears) in Oregon are large and expanding. In general, cougar populations have been increasing in number and expanding in geographic range for several decades since they were reclassified as game mammals. ODFW estimates the statewide cougar population to be in excess of 5,700 animals. Black bears also have increased in numbers and range during the same period, although they are not as widespread as

³³ Wild ungulate species in Oregon include elk, deer, pronghorn, bighorn sheep, and mountain goats.

cougars because of different habitat requirements. ODFW estimates the black bear population in Oregon at 25,000-30,000 animals. No statewide estimate of coyotes is available, but they are considered abundant and ubiquitous in Oregon.

There exists an ongoing debate regarding the effects of these carnivores on ungulate resources in Oregon. Deer and elk are the primary prey of cougars in Oregon and elsewhere in the western United States (Hornocker 1970, Murphy 1998, Nowak 1999, Johnson – personal communication). Black bears opportunistically prey on ungulates, taking primarily newborn young or stealing kills made by cougars. Research in Oregon (Trainer et al. 1983) and elsewhere has shown that coyotes prey on young ungulates, primarily deer (Trainer et al. 1975) and pronghorn (Trainer et al. 1983), and to some extent elk calves (Johnson, unpublished). However, there remains uncertainty among experts regarding the degree to which carnivores influence ungulate prey. Ongoing and future research may unravel more of the inherent mystery surrounding this controversial subject.

Reduction of elk hunting opportunities (primarily antlerless) and inability to reach or maintain management objectives in some northeast Oregon wildlife management units is believed to be the result of increasing predation pressure by cougars, and to some extent black bears. Other mortality factors (e.g. disease, starvation, winter loss) also affect these elk populations. Data from current research on elk nutrition/cougar predation in northeastern Oregon has shown cougar predation to be the main mortality factor for elk calves in the study area. However, recent research indicates that recurrent nutritional deprivation may be implicated in low calf recruitment in forest landscapes (Cook et al. 2004). An ongoing study by Idaho wildlife researchers has revealed higher than expected predation on elk calves by black bears.³⁴

Current cougar management strategies have been ineffective in managing cougar numbers and directing cougar harvest in areas where cougar predation is suspected to be affecting elk productivity. The current 10-month open season, statewide open area and unlimited tag numbers have resulted in opportunistic harvest of cougars by hunters, primarily during deer and elk hunting seasons. The resulting harvest is much more random across the landscape than occurred in the past with hound hunting strategies. Strategies to manage cougar and black bear numbers in areas occupied by wolves could be hampered by this situation and may be changed in the future.

A. Wolf Predation of Ungulates

In eastern Oregon, mule deer and Rocky Mountain elk represent the most abundant prey species. To a lesser extent, white-tailed deer, pronghorn, Rocky Mountain bighorn sheep, California bighorn sheep and mountain goats could potentially be prey for wolves on the eastside. Mule deer likely would be the preferred wild prey in high desert habitats of southeastern Oregon. Wolves that migrate into areas of western Oregon would find populations of black-tailed deer, Roosevelt elk and, potentially, Columbian white-tailed deer.

Ungulate populations are composed of prime age animals and more vulnerable animals including young of the year, older animals, and diseased and injured individuals. Wolves tend to exploit the more vulnerable, less fit individuals. Heavily pregnant female ungulates also are prime targets for wolves. Prey species have evolved defensive techniques such as alertness, speed, herding behavior,

³⁴ Personal communication with Pete Zager, Idaho Fish and Game

swamping, spacing, migration and retreating into water, all of which tend to reduce probability of a kill by wolves. Because of these defense mechanisms, the majority of hunts initiated by wolves are unsuccessful. Hunting success of wolves is variable and can be influenced by terrain, weather, snow, time of day, prey species, age and condition vulnerability, experience and other factors (Mech and Peterson 2003).

Much has been written in the scientific literature regarding the interaction and effects of wolves on prey numbers, but few common conclusions have been drawn. Wolf researchers Mech and Peterson (2003) suggest three reasons why scientists have been unable to reach agreement regarding the significance of wolf predation on the dynamics of prey populations. These are: 1) each predator-prey system studied had ecological conditions that were unique; 2) wolf-prey systems are inherently complex; and 3) population data for wolves and their prey are imprecise and predation rates are variable.

The question of whether mortality caused by wolves is considered “compensatory” or “additive” has generated much debate among researchers and the public. Wolf predation is considered compensatory when it takes the place of other mortality factors, such as when wolves kill prey that would have died anyway from starvation or disease. Additive mortality occurs when wolves kill prey that were not necessarily destined to die of other causes in the short term. These theories are somewhat unclear when describing the nature of wolf predation involving young animals (calves and fawns). It is unlikely that all young killed by wolves were predisposed to die at a young age. In this example, some wolf mortality on young would be considered additive. More research and application to Oregon of research that has been done elsewhere is needed if biologists are to understand the role wolves play in influencing prey numbers.

As wolves enter Oregon and biologists radio-collar individual wolves, monitoring data will reveal more specifics regarding wolf-prey interactions. Some biologists predict wolf-prey interaction in Oregon will be analogous to that in Idaho because of the similarities in prey and habitats. Wolves in Idaho prefer elk as the primary prey species. A winter study of predation by wolves and cougars in central Idaho during 1999-2001 documented 120 ungulate kills by wolves. Mule deer accounted for 23 percent (28 animals) of the total, while elk accounted for 77 percent (92 animals).³⁵ Elk are predicted to be the preferred prey in the Willowa, Blue and Ochoco mountains of central and northeastern Oregon.

Mech and Peterson wrote in 2003 that predation rates calculated for various prey species have been measured many times and are highly variable.³⁶ Predicting preferred ungulate prey and predation rates for wolves in Oregon would be difficult at best. Where wolves become established and at what population level will play an important role in attempting such predictions. In Oregon, where three sub-species of deer and two sub-species of elk are found, predictions become even more tenuous.

³⁵ Curt Mack, Nez Perce Tribe wolf biologist, presentation to Wolf Advisory Committee, January 2004.

³⁶ See Mech and Peterson (2003), Table 55 (p.144), “Wolf kill rates during winter.”

B. Big Game Wildlife Management Units and Management Objectives

ODFW established Wildlife Management Units (WMUs) and management objectives (MOs) to manage deer and elk populations and hunter numbers. WMUs were established to allocate harvest and distribute hunters rather than delineate big game species herd ranges. WMUs are long standing geographic areas with boundary descriptions and maps printed in the annual Oregon Big Game Regulations pamphlet. MOs are the number of deer and elk that ODFW strives to maintain in each WMU in the state (see Figures 5 and 6 for maps of WMUs).

There are two types of MOs for each WMU. MOs for deer and elk are set for both the population size and the desired ratio of bucks to 100 does (buck ratio) and bulls to 100 cows (bull ratio). Annual herd composition information, including buck, bull, and spring fawn and calf to adult ratios, are used to monitor the adult male population segment and the recruitment of young animals into the population. Management strategies are designed to maintain population characteristics near MOs.

When ODFW determines MOs for deer and elk in a WMU, a variety of factors are considered. These include landowner tolerance, habitat, land ownership, winter range, carrying capacity and public access. How each factor influences the final MO varies by species and the unique circumstances of each management unit. The primary consideration for each MO is the department's statutory obligation to prevent the serious depletion of indigenous wildlife, provide optimum recreational and aesthetic benefits, and maintain populations at levels compatible with the primary uses of the land. In areas where deer and elk winter primarily on private lands, damage to private property is a critical factor influencing MOs.

- **Elk Population Information**

Appendix L displays MOs for elk populations for each WMU in the state. Statewide, most populations and bull ratios are close to the desired MO. Where populations are below the MO, particularly in some northeastern Oregon units, calf-to-cow ratios show a downward trend since 1965. Factors contributing to the decline include predation, nutrition (habitat condition) and human-caused factors. In 2009, the statewide population of Rocky Mountain and Roosevelt elk is estimated to be 121,000. (Figure 5 maps 2009 elk population estimates by WMU.)

Historic records indicate both subspecies of elk were numerous and widely distributed in Oregon prior to the arrival of early settlers. Settlers hunted elk as a primary food source and hunting by market hunters was unregulated until the early 1900s. Concern was expressed by Oregonians about the scarcity of elk by the 1880s. Hunting was closed by the Oregon Legislature in 1909, and elk populations began a slow recovery in remote areas of eastern and western Oregon. Elk hunting was again allowed by 1933. In the 1940s modern techniques for managing wildlife allowed elk numbers to increase until the 1980s, when MOs with population numbers were adopted. Elk populations have remained stable throughout the state since that time.

Roosevelt elk populations are stable or increasing in western Oregon (see Appendix L for a list of MOs for each WMU). Most Roosevelt elk populations are near both bull ratio and population MOs. Habitat changes resulting from changes in timber management practices may be contributing to an apparent shift in the population from federal forestlands to private timber and agricultural lands in some areas. Predation by cougars may be contributing to local declines or maintaining populations at current levels. The Roosevelt elk population for Oregon is estimated at approximately 60,000 animals.

Total Rocky Mountain elk numbers have been stable the last six years. While some areas have declined, other portions of the state are seeing elk numbers expand. With the change in bull management strategies in the mid-1990s the ratio of bulls to cows has increased. More mature bulls are now observed at elk viewing sites and in the hunter bag limit. Timber harvest declines during the past 10 years on federal lands have caused slight distribution changes throughout private and public land. Elk nutrition plays significant role in survival during the winter months (Cook et al. 2004). Drought in eastern Oregon the last several years has resulted in poor body condition. Cougar and black bear predation also are major factors for localized declines in elk recruitment and overall production. The current Rocky Mountain elk population is estimated to be approximately 61,000.

- **Mule Deer Population Information**

John Fremont reported few deer or other big-game species in southeastern Oregon during the 1840s. However, by the late 1850s, gold miners traveling from California to the Boise Basin found deer abundant in eastern Oregon. Vernon Bailey (1936) estimated Oregon's mule deer population to be 39,000 to 75,000 animals from 1926 to 1933. Mule deer populations increased through the 1930s and 1940s, peaking during the mid-1950s, mid-1960s and mid-1970s. The estimated spring population in 1990 was 256,000 animals 26 percent below the established statewide management objective of 344,900 as listed in the Oregon Mule Deer Plan (ODFW 1990). The estimated 2009 population was 216,000 and continues to remain below established management objectives.

Fluctuations in mule deer populations can be attributed to several factors that directly or indirectly affect habitat. Drought conditions reduce forage and cover values, while severe winter weather conditions can result in large losses of deer. Both factors can cause poor deer condition and result in lower deer survival. In contrast, years of adequate moisture and mild winters will normally result in increased deer populations.

Overgrazing by livestock during the late 1800s and early 1900s resulted in rangelands dominated by shrubs and forage species that were more favorable for deer, populations increased. Similar patterns were noted in most western states (Workman and Low, 1976). Increased fire suppression activities allowed the encroachment of woody vegetation resulting in old decadent shrub plants that have less nutritional value for deer and the loss of desirable shrub and forage species (ODFW 2003).

Many mule deer ranges no longer will support historic deer population levels due to reduction of habitat caused by human development and changes in land use. Moderate population increases may be attained in some units with careful management. However, a return to the high deer population levels present in the 1950s, 60s and 70s probably will not occur due to changes to habitat and public acceptance. Appendix L contains tables of mule deer MOs and mule deer

population estimates for each WMU with mule deer. Figure 6 maps 2009 mule deer population estimates by WMU.

- **Black-tailed Deer Population Information**

Black-tailed deer populations are declining in many areas of western Oregon. Habitat changes (resulting from changes in timber management practices including dramatic reductions in timber harvest on federal property), diseases (particularly deer hair loss syndrome) and predation (bobcats, coyotes and cougars) are factors contributing to recent declines. There are no MOs for black-tailed deer. In 1998 the black-tailed deer population was estimated at approximately 387,000. Current black-tailed deer population trend information is not available for all areas; available information indicates the population has declined since that time. The current black-tailed deer population for Oregon is estimated at approximately 320,000 animals. It is estimated that approximately 54 percent of the population (173,000 deer) occurs in southwest Oregon in the Melrose, Tioga, Sixes, Powers, Chetco, Indigo, Dixon, Applegate, Evans Creek and Rogue WMUs.

- **White-tailed Deer Population Information**

The Idaho white-tailed deer inhabits portions of northeastern Oregon. Populations have been expanding geographically as well as numerically during the past 25 years. Preferred habitats include low elevation riparian areas, low elevation forested areas and agricultural areas. The most abundant populations are located along the western edge of the Blue Mountains in Umatilla county as well as in portions of Union and Wallowa counties. No population estimates are available at this time.

Two populations of Columbian white-tailed deer exist in Oregon, one in southwestern Oregon near Roseburg and the other on a series of islands and the mainland in the lower Columbia River. There have been no formal MOs adopted for this sub-species of white-tailed deer. Columbian white-tailed deer were listed as endangered by the federal government in 1973 and were included on the original state endangered list in 1987. Populations have been increasing to the degree that the Roseburg population was removed from the state endangered species list in 1995 and federally delisted in 2003. The lower Columbia River population remains listed under the federal ESA but populations are increasing to the point where a downlisting to threatened or delisting is being considered. Population estimates for the two populations are approximately 6,000 animals in the Roseburg population and 400-600 animals in the Columbia population, which includes animals found in Washington. Major threats to the population include disease (adenovirus and deer hair loss syndrome), predation, habitat loss and major flooding in the Columbia River area. Trapping and transplanting is a major activity to repopulate historic range and to secure the populations' survival in case of a catastrophic event.

- **Pronghorn Population Information**

Oregon's pronghorn population has increased during the last 25 years, with the majority of the animals occupying the arid sagebrush/grasslands of southeastern Oregon. Short-term fluctuations in population levels and recruitment have occurred during this time period. These fluctuations were primarily attributed to changes in coyote abundance and winter weather severity. The long-term population increase has been aided by development of irrigated alfalfa on private land, which has expanded and improved pronghorn habitat in many areas. The estimated pronghorn population for Oregon is 24,000 animals.

- **California Bighorn Sheep Population Information**

California bighorn sheep were extirpated in Oregon by 1912. All 30 current herds were reestablished through transplants since 1954. Most herds in the state are stable to increasing. Factors affecting the four herds experiencing recent declines are thought to be predation (cougar and eagle), habitat issues (juniper encroachment and noxious weeds) and disease. California bighorn are susceptible to *pasteurella pneumonia* outbreaks, but most of the range does not have domestic sheep allotments, therefore the potential for infection is lower than in Rocky Mountain bighorn sheep populations. The current California bighorn sheep population in Oregon is estimated to be 3,700.

- **Rocky Mountain Bighorn Sheep Population Information**

Rocky Mountain bighorn sheep were reintroduced in 1971 after being extirpated from the state in the 1940s. A tri-state, multi-agency and private conservation group effort to reestablish bighorn sheep in Hells Canyon was started in 1997 (Hells Canyon Bighorn Restoration Initiative). Ongoing research indicates disease (pneumonia) from domestic sheep and goats is the primary cause of mortality followed by cougar predation on adults. The population estimate in 2009 was 850 animals (632 in Oregon) in 16 herds or subpopulations. This project area includes 5.6 million acres in the Snake River drainage in Oregon, Idaho and Washington.

Some herds have "patchy" habitat (e.g., Wenaha) where they move from cliff face to cliff face through grassland where they would be vulnerable to wolf predation. Most sheep herds have low population numbers and may need additional protection from wolf predation.

- **Rocky Mountain Goat Population Information**

Rocky Mountain goats indigenous to the north central Cascades and northeast Oregon likely disappeared prior to European settlement. Restoration efforts began in 1950 with a release of five goats in the Wallowa Mountains. More recently, successful reintroductions have occurred in the Elkhorn Mountains, Wenaha, Cascade Mountains and Hells Canyon. Populations have exhibited good production and recruitment. Pioneering of vacant habitats has occurred in the Vinegar Hill, Mount Ireland and Strawberry Mountains areas. Future management will be focused on restoration efforts in suitable habitats. Oregon currently has an estimated 805 mountain goats for 2009.

Because mountain goats primarily inhabit rugged cliff type habitat, wolf predation is not expected to be a concern. However, for some goat herds in Alberta, wolf predation has caused considerable declines in kid recruitment.

C. Strategies to Address Wolf-Ungulate Interactions

Objective

- Develop and implement adaptive management strategies to achieve conservation goals for wolves while meeting management objectives for ungulate species.

Strategies

- Provide wolf population and monitoring information to ungulate managers annually to assess potential impacts of wolves on all ungulates.
- When predation is determined to be the primary cause of ungulate population or recruitment decline locally or in a WMU, ensure carnivore-focused management actions.
 - If the primary predator species is unknown and wolves are:
 - a state-listed species, initiate management actions that manage other carnivore populations to achieve ungulate population goals before considering actions involving wolves.
 - not a state-listed species, initiate actions to manage appropriate carnivore populations to achieve ungulate goals.
 - If wolves are determined to be the cause of ungulate population or recruitment decline and are:
 - a state-listed species, consider capturing and relocating wolves to other suitable habitat.
 - not a state-listed species, use translocation, relocation or controlled take to reduce wolf numbers.
- Active management (e.g., non-lethal or lethal removal) of wolves will be initiated in areas where ungulate species have been transplanted to supplement or expand their historic range, if wolves are determined to be affecting the success of the transplant goals and the Commission determines that such take of wolves would be consistent with conservation of wolves in Oregon. Lethal removal of wolves will be an option only following delisting.
- Active management of wolves may be initiated in important ungulate winter ranges or winter feeding sites that serve to draw ungulates away from agricultural lands. These sites may attract wolves and could cause ungulates to abandon them in some circumstances.

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