

**Pre-decision  
Environmental Assessment**

**Wildlife Services  
Gray Wolf Damage Management  
In Oregon**

**Lead Agency:**

U.S. Department of Agriculture  
Animal and Plant Health Inspection Service  
Wildlife Services

**Cooperating Agencies:**

State of Oregon  
Department of Fish and Wildlife

**July, 2012**

**Table of Contents**

List of Acronyms and Abbreviations Used in this Document .....	iii
EXECUTIVE SUMMARY .....	iv
CHAPTER 1. PURPOSE AND NEED FOR ACTION.....	1
1.1 Purpose .....	6
1.2 Need for Action .....	6
1.3 Scope of Analysis – Location and Actions Analyzed.....	10
1.4 ODFW Wolf Management Goals and Objectives.....	12
1.5 Period for which this EA Remains Valid.....	13
1.6 Decision to be Made .....	13
1.7 Summary of Public Involvement Efforts .....	14
1.8 Relationship of this EA to other Environmental Documents.....	14
1.9 Authority and Compliance.....	15
1.9.1 Authority of Federal and State Agencies in Wolf Management .....	15
1.9.2 Compliance with Federal and State Laws, Policies and Executive Orders.....	17
CHAPTER 2. DESCRIPTION OF ALTERNATIVES .....	21
2.1 Alternative 1 - No Action .....	21
2.2 Alternative 2 – Non-lethal Wolf Damage Management Methods Only .....	24
2.3 Alternative 3 – Proposed Action – Integrated Wolf Damage Management.....	29
2.4 Summary of Actions allowed by Alternative.....	35
2.5 Alternatives Considered but Rejected from Detailed Analysis, with Rationale .....	35
CHAPTER 3 - ISSUES IMPORTANT TO THE ANALYSIS OF IMPACTS .....	38
3.1 Issues Driving the Analysis .....	38
3.2 Issues Not Analyzed in Detail, with Rationale .....	38
3.3 Evaluation Methodology .....	42
CHAPTER 4: ENVIRONMENTAL CONSEQUENCES .....	44
4.1 Alternative 1 – No Action.....	44
4.1.1 Impact on wolf population.....	44
Causes of wolf mortality.....	45
4.1.2 Impacts on non-target animals and human safety.....	54
4.1.3 Social and Aesthetic Perspectives.....	56
4.1.4 Effectiveness.....	62
4.2 - Alternative 2 – Non-lethal Actions Only.....	65
4.2.1 Impact on wolf population.....	66
4.2.2 Impacts on non-target animals and human safety.....	66
4.2.3 Social and Aesthetic Perspectives.....	67
4.2.4 Effectiveness.....	68
4.3 Alternative 3 – Proposed Action WS IWDM Assistance to ODFW.....	69
4.3.1 Impact on wolf population.....	69
4.3.2 Impacts on non-target animals and human safety.....	71
4.3.3 Social and Aesthetic Perspectives.....	72
4.3.4 Effectiveness.....	73
4.4 Summary and Conclusions .....	74
CHAPTER 5.0 LITERATURE CITED.....	77
Wayne, R. K., N. Lehman, D. Girman, P. J. P. Gogan, D. A. Gilbert, K. Hansen, R. O. Peterson, U. S. Seal, A. Eisenhawer, L. D. Mech and R. J. Krumenaker. 1991. Conservation Genetics of the Endangered Isle Royale Gray Wolf. Conservation Biology 5: 41-51.....	90
CHAPTER 6.0 AGENCIES AND PERSONS CONSULTED.....	92
Appendix A: OAR 635-110.....	96
Appendix B: Correspondence from Oregon Department of Fish and Wildlife and The Confederated Tribes of the Umatilla Indian Reservation.....	102
Appendix C: USFWS consultation on lynx.....	106

## **List of Acronyms and Abbreviations Used in this Document**

APHIS	Animal and Plant Health Inspection Service (USDA agency)
AVMA	American Veterinary Medical Association
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management (USDI agency)
CEQ	President's Council on Environmental Quality
CFR	Code of Federal Regulations
CTUIR	Confederated Tribes of the Umatilla Indian Reservation
DM	Department of the Interior's Departmental Manual
DPS	Distinct Population Segment
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
ESA	Endangered species Act
FR	Federal Register
GYA	Greater Yellowstone Area
IDFG	Idaho Department of Fish and Game
IUCN	International Union for Conservation of Nature
km	kilometer
MIS	Management Information System
MOU	Memorandum of Understanding
NASS	National Agricultural Statistics Service
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRM	Northern Rocky Mountain
OAR	Oregon Administrative Rule
ODA	Oregon Department of Agriculture
ODFW	Oregon Department of Fish and Wildlife
OFWC	Oregon Fish and Wildlife Commission
ORS	Oregon Revised Statute
OSP	Oregon State Police
OWCMP	Oregon Wolf Conservation and Management Plan
RAG	Radio Activated Guard
T&E	Threatened and Endangered
TTD	Tranquilizer Trap Tab
USC	United States Code
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USFS	United States Forest Service (USDA agency)
USFWS	United States Fish and Wildlife Service (USDI agency)
WDNR	Wisconsin Department of Natural Resources
WSA	Wilderness Study Area
WS	Wildlife Services (USDA-APHIS program)

## EXECUTIVE SUMMARY

This environmental assessment (EA) evaluates a proposed action and alternatives to assist the State of Oregon, Department of Fish and Wildlife (ODFW) and Native American tribal governments with management of gray wolf (*Canis lupus*) conflicts throughout the state. The actions to protect livestock are immediately necessary in portions of the state where the gray wolf population is managed by ODFW and by the Confederated Tribes of the Umatilla Indian Reservation (CTUIR). The need for action is based on confirmed and *chronic* livestock depredation, and although less likely, the potential for wolves to threaten human safety.

### Legal status of wolves in Oregon

The legal status of gray wolves in Oregon has changed several times after a 60 year absence from the state. In 1999, wolves were identified as beginning to reenter Oregon from an experimental population in Idaho, part of a successful reintroduction effort that also included Montana and Wyoming. Wolves in eastern Oregon have both increased in number, and have been the subject of several status changes of federal Endangered Species Act (ESA) designations. Regardless of the federal listing, gray wolves in Oregon have been protected by State ESA. The lively and rapidly changing legal history of gray wolves in Oregon is summarized in the EA.

The most pertinent and recent regulatory actions have been a March 5, 2011 federal delisting of wolves from the federal ESA in eastern Oregon, *which will not be subject to judicial review* (76 FR 25590; May 5, 2011, as mandated by Public Law 112–10). The federal delisting applies to those gray wolves that are within the boundary of the Northern Rocky Mountain Distinct Population Segment (NRM DPS) which in Oregon is defined by that portion of Oregon east of Highway 395 and Highway 78 north of Burns Junction and that portion of Oregon east of Highway 95 south of Burns Junction (74 FR 15123; April 2, 2009). This boundary falls within ODFW’s east wolf management zone.

On October 5, 2011, Cascadia Wildlands, Center for Biological Diversity, and Oregon Wild petitioned the Oregon Court of Appeals for judicial review of OAR 625-110-0010(6)-(8), the ODFW rule permitting ODFW to authorize the lethal take of wolves that chronically depredate on livestock, provided certain conditions are met. The Court granted petitioners a “stay” of the rule pending review (Cascadia Wildlands, et al. v. Dept. of Fish and Wildlife, et al., No. 149672 (Or. Ct. App. Nov. 15, 2011) order staying enforcement of rule pending judicial review). Until the court completes its review, ODFW is enjoined from enforcing or implementing the rule. Wildlife Services would not respond to a request from ODFW to remove wolves unless the Court determined that OAR 625-110-0010(6)-(8) is valid or ODFW is otherwise permitted to authorize the lethal take of wolves.

Wolves in the eastern third of Oregon within the NRM DPS boundary are now managed by the State of Oregon, or for those lands of Indian Nations which are identified as reservation lands, by the sovereign tribal authority. Gray wolves are currently classified as endangered under Oregon state law throughout the state (Oregon Revised Statute (ORS) 496.171-192). Based on the

expected re-establishment of wolves in Oregon, ODFW developed an Oregon Wolf Conservation and Management Plan (OWCMP) in 2005

([http://www.dfw.state.or.us/Wolves/management\\_plan.asp](http://www.dfw.state.or.us/Wolves/management_plan.asp)), updated in 2010, to meet the requirements of both the Oregon ESA and Oregon Wildlife Policy. The goal of OWCMP is to “. . . ensure the conservation of gray wolves as required by Oregon law while protecting the social and economic interests of all Oregonians.” (ODFW 2010a).

Gray wolves are expected to continue to increase in number and to migrate from those portions of eastern Oregon where wolves no longer receive protections under the federal ESA, and into other parts of Oregon to eventually establish populations in the Cascade Mountains. Outside of the NRM DPS boundary, wolves would receive additional protections under the federal ESA where they are currently classified as endangered (74 FR 15123; April 2, 2009). A status review for gray wolves outside of the NRM DPS in Oregon is expected to be completed by September 30, 2012. The outcome of the review will identify if gray wolves should continue to receive protections under the federal ESA (USFWS 2012). Where gray wolves are federally protected, the Federal/State Coordination Strategy for Implementation of Oregon’s Wolf Plan (as updated March 2011, F/S Strategy), governs agency roles and responsibilities. The federal U.S. Fish and Wildlife Service would be the responsible federal agency for regulatory compliance for any management decisions affecting wolves found in those portions of Oregon west of the NRM DPS line while wolves are protected under the federal ESA. However, it is not unreasonable to expect that wolf management outside of the NRM DPS in Oregon may become a responsibility of ODFW as a result of a federal delisting. If a federal delisting were to occur, gray wolves throughout the State would be managed according the OWCMP (ODFW 2010a, or as amended), and OAR 635-110 (Appendix A) which would provide criteria for conservation and management, similar to wolves within the NRM DPS in eastern Oregon. Again, the exception to state management authority would be those lands managed under sovereign tribal authority.

### Need for Action

The increasing presence of wolves in Oregon has initiated a growing need to mitigate and resolve conflicts when wolves cause harm to livestock. The EA discusses the direct and indirect effects of wolf depredation on livestock. The numbers of livestock confirmed to have been killed by wolves to date in Oregon may represent a minimal number, with more livestock kills probably going unconfirmed.

### Actions Analyzed

Wildlife Services (WS) proposes to assist ODFW with resolving gray wolf damage to livestock, as directed by ODFW under OAR 635-110. Actions would include assisting ODFW to reduce wolf conflicts to protect livestock<sup>1</sup>, which includes herding and guarding dogs, and possibly

---

<sup>1</sup> The OWCMP (ODFW 2010a) uses the term livestock to include a provision in the state agricultural laws (ORS 609.125) which defines “livestock” to mean: horses, mules, jackasses, cattle, llamas, alpacas, sheep, goats, swine, domesticated fowl and any fur-bearing animal bred and maintained commercially or otherwise, within pens, cages

human safety, as strictly defined in OWCMP (ODFW 2010a) and OAR 635-110 (Appendix A). WS would also assist ODFW with identifying wolf predation events on livestock and provide a variety of non-lethal damage management assistance to livestock producers. At the request and direction of ODFW, WS may lethally remove individual wolves that have been identified as being involved in chronic livestock depredations.

On tribal lands, WS proposes to take similar actions to assist tribal governments with non-lethal wolf management. Additionally, WS proposes to assist CTUIR with wolf depredation on livestock and possibly human safety with both non-lethal and lethal control actions as directed by CTUIR.

### Alternatives

A “No Action” alternative was evaluated for comparison to describe the environmental baseline. If WS took no action, ODFW would implement the OWCMP to the best of its ability, including targeting depredating wolves for lethal control (Appendix B), as provided under OAR 653-110 and ODFW (2010a). CTUIR have indicated that they would also implement wolf depredation management if WS were unable to assist (Appendix B). A non-lethal methods only alternative, which would increase the WS role in providing information and non-lethal wolf damage management services, was also evaluated. The non-lethal methods only alternative would preclude any lethal actions or recommendations by WS.

### Environmental Consequences

The proposal was examined to reveal its effects on the Oregon wolf population, including the potential for wolves to be conserved to the point of a State ESA delisting throughout Oregon, and the potential for establishment of wolf packs outside the current federally delisted NRM DPS area. The EA also examined the effects on non-target animals, human safety, and on social and aesthetic perspectives including public acceptance, humanness and aesthetic enjoyment of wolves. The effectiveness of the alternatives in meeting the purpose and need is also discussed and how well the alternatives alleviate livestock damages. The assessment finds that there would continue to be a growing wolf population in Oregon if the proposal is adopted, and it would likely have no or very little negative effects on other animals and humans. A variety of social viewpoints are likely to be held by the public. The proposal would be likely have a net positive effect on the public’s opportunity to view wolves in the wild because professional wolf damage management is an important component of overall wolf conservation, and because WS assistance would allow ODFW and CTUIR to maximize efforts to manage wolf conservation activities (Appendix B). All of the alternatives would involve state, federal or tribal agency action to reduce chronic livestock losses because ODFW and CTUIR would be implementing lethal removal actions if WS were not (Appendix B). Because the proposed action is limited in scope, both negative and positive environmental consequences would be relatively minor. The proposed

---

and hitches (ORS 609.125). In addition, for purposes of authorizing response to wolf-related conflicts, ODFW adds to that definition bison and working dogs (guarding dogs or herding dogs) (ODFW 2010a).

action would be the most effective in managing chronic livestock depredation conflicts outlined in OAR 635-110 and OWCMP (ODFW 2010a).

The No Action alternative was found to have some of the same effects as the proposed action because if Wildlife Services does not adopt the proposed action, it would be implemented by the State of Oregon, or its agents, as has been demonstrated and discussed in the EA, under the same strict guidelines as allowed in the OWCMP (ODFW 2010a). It is also likely that tribal governments would similarly implement the same actions to manage wolf conflicts, and indeed the CTUIR has indicated that it would. ODFW has indicated that without the assistance of the WS program, the no action alternative would likely result in increased livestock losses, and ODFW's overall wolf conservation efforts in Oregon would be challenged.

A Non-lethal Only Alternative was also evaluated in detail. It would have no direct negative effect on wolves or non-target animals, but once again, ODFW and CTUIR would remove problem wolves as allowed under the OWCMP (ODFW 2010a) and OAR 65-110, or tribal management authority, therefore the net effect would be the same as No Action alternative. Some members of the public might prefer this alternative if no lethal actions were taken, but lethal actions would be taken as prescribed by the OWCMP (ODFW 2010a) whether WS assisted or not. Social perspectives should be similar to the No Action and Proposed Action alternatives since any necessary lethal wolf damage to livestock will be initiated by ODFW and/or CTUIR if WS chose not to assist.

## CHAPTER 1. PURPOSE AND NEED FOR ACTION

### Introduction

In 1999, a radio-collared female gray wolf from the Idaho experimental population was discovered in Oregon, captured by the U.S. Fish and Wildlife Service (USFWS), and returned to Idaho. This was the first wolf confirmed in Oregon in the 60 years since wolves had been purposefully eradicated from the state. Two other wolves were subsequently found dead in Oregon in 2000. One was a radio collared male from Idaho that was struck by a vehicle, and the other was an un-collared male wolf which was found shot. The un-collared wolf was also determined to have originated from the Idaho experimental population.

Continued dispersal of wolves has been, and is expected as a result of the re-establishment of wolf populations in the states of Montana, Wyoming and Idaho through the federal wolf recovery program. Since wolves in these states have increased in numbers and/ or expanded their range, wolf biologists correctly predicted they would disperse into Oregon from Idaho and establish breeding populations. Dispersal of wolves from Idaho into Oregon has resulted in four known packs, all of which had pups in eastern Oregon (the Wenaha, Imnaha, and Snake River packs in Wallowa County and the Walla Walla pack in Umatilla County, Oregon). As of December 2011, the minimum number of wolves in eastern Oregon at the end of 2011 was 29 (ODFW 2012b). In addition, ODFW receives frequent reports of wolves in the Cascade Mountains and Blue Mountains. Historically, wolves occurred throughout most of the state (ODFW 2010a).

Managing human/wolf conflicts is an integral part of wolf management in Oregon where emphasis is placed on goals and objectives that the Oregon Fish and Wildlife Commission (OFWC) adopted in the Oregon Wolf Conservation and Management Plan (OWCMP) (ODFW 2010a). The OWCMP (ODFW 2010a) put forth strategies to minimize wolf conflicts by incorporating conflict avoidance, information, education, and limited removals when chronic livestock depredations occur.

The OWCMP (ODFW 2010a) uses the term livestock to include a provision in the state agricultural laws (ORS 609.125) which defines “livestock” to mean: horses, mules, jackasses, cattle, llamas, alpacas, sheep, goats, swine, domesticated fowl and any fur-bearing animal bred and maintained commercially or otherwise, within pens, cages and hutches (ORS 609.125). In addition, for purposes of authorizing response to wolf-related conflicts, ODFW adds to that definition bison and working dogs (guarding dogs or herding dogs) (ODFW 2010a.)

The OWCMP (ODFW 2010a) also allows for responding to potential threats to human safety.

OWCMP (ODFW 2010a) was first developed in 2005 to address the inevitable need to manage wolves in the state. The OWCMP (ODFW 2010a) would also serve the State’s legal obligations under the Oregon ESA. OWCMP was updated in 2010 and is the basis for the environmental baseline in terms of wolf management in Oregon.

## CHAPTER 1. PURPOSE AND NEED FOR ACTION

Although livestock losses to wolves are minimal industry-wide, losses to individual operators can be significant (Fritts et al. 1992, Mack et al. 1992). Control of offending wolves, along with increased livestock management practices (*e.g.*, carcass management, fencing, etc.), compensation for losses, and communication with the public have all contributed to wolf recovery where wolf-livestock conflicts exist (Fritts et al. 1992, Mack et al. 1992, Niemeyer et al. 1994, Bangs et al. 2006).

The Oregon Department of Fish and Wildlife (ODFW) and The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) have requested that APHIS, Wildlife Services (WS) assist with managing gray wolf damage to livestock and potentially human safety, as defined in OWCMP (ODFW 2010a) and in CTUIR management decisions respectively. As wolves have become established in parts of the state, livestock damages have occurred as a result of actions by some wolves. The reason WS is requested to assist in this case is because WS has special expertise in evaluating and confirming depredation by predators on livestock, technical expertise in non-lethal methods to minimize depredation on livestock, and expertise in live-capturing for radio collaring /monitoring, as well as in removing individual predators responsible for depredation or that are deemed to be threats to livestock. WS also has personnel distributed in the State in field locations to provide wildlife damage management assistance, as well as aircraft and pilots/crews, or access to or ability to contract with private sources of aerial operations, and thus is readily suited to providing the requested assistance in an efficient and effective manner.

The proposed action would more immediately occur where gray wolves are not federally managed within Oregon's portion of the Northern Rocky Mountain, Distinct Population Segment boundary<sup>2</sup> (NRM DPS) (Figure 1). Gray wolves throughout Oregon are protected under State law as endangered (ORS 496.171-192), with two management zones having been established by ODFW and Oregon Fish and Wildlife Commission (Figure 2). Therefore, gray wolves in NRM DPS area of the State (a portion of ODFW Eastern management zone) fall under the protection and management authority of ODFW.

### Recent Legal Status Changes

Wolves had been absent from Oregon for more than 30 years when they gained endangered status in 1974 with their listing under the federal ESA. In 1987, USFWS completed the revised Northern Rocky Mountain Wolf Recovery Plan. Four years later Congress initiated an administrative process to reintroduce wolves into Yellowstone National Park (YNP) and central Idaho. In 1995 and 1996, 66 wolves were captured in Alberta and British Columbia, Canada. Of those, 35 were released in central Idaho and 31 were released into YNP. Wolves were protected as a "non-essential experimental population" under the federal ESA within a specified zone that included portions of Idaho, Wyoming and Montana.

---

<sup>2</sup> The NRM DPS in Oregon includes that portion of Oregon east of Highway 395 and Highway 78 north of Burns Junction and that portion of Oregon east of Highway 95 south of Burns Junction. (FR: April 2, 2009 (Vol. 74, No. 62, Page 15123-15188))

## CHAPTER 1. PURPOSE AND NEED FOR ACTION

When the OWCMP was first adopted in 2005, gray wolves in Oregon were under the primary jurisdiction of the USFWS and were federally listed as endangered under the federal ESA of 1973. On May 4, 2009, wolves in the NRM DPS (east of Hwy. 395/78/95) of Oregon were removed from the protections of the federal ESA (Figure 1). However, on August 5, 2010, federal protections for wolves in the NRM DPS portion of Oregon were reinstated, which meant that all wolves in Oregon were federally-listed as endangered.

Subsequently, on May 5, 2011, the USFWS published a final rule implementing Public Law 112-10, Section 1713, directing the Secretary of Interior to effectively delist wolves in the identified NRM DPS, including the portion of that boundary identified in Oregon (Figure 1), (76 FR 25590). That act of Congress changed the legal status of wolves in the eastern third of Oregon (the NRM DPS portion of Oregon) to no longer fall under any federal protection. Thus the only protections in effect in this area are those established by State law under the Oregon Endangered Species Act (ORS 496.171-192).

On October 5, 2011, Cascadia Wildlands, Center for Biological Diversity, and Oregon Wild petitioned the Oregon Court of Appeals for judicial review of OAR 625-110-0010(6)-(8), the ODFW rule permitting ODFW to authorize the lethal take of wolves that chronically depredate on livestock, provided certain conditions are met. The Court granted petitioners a “stay” of the rule pending review (Cascadia Wildlands, et al. v. Dept. of Fish and Wildlife, et al., No. 149672 (Or. Ct. App. Nov. 15, 2011) order staying enforcement of rule pending judicial review). Until the court completes its review, ODFW is enjoined from enforcing or implementing the rule. Wildlife Services would not respond to a request from ODFW to lethally remove wolves that prey on livestock unless the Court determined that OAR 625-110-0010(6)-(8) is valid, or ODFW is otherwise legally authorized to lethally take state managed, Oregon ESA listed wolves.

Wolf management is a relatively new issue in Oregon. During the initial phases of recovery of the gray wolf under the Oregon State ESA as outlined in OAR 635-110 (Appendix A) and OWCMP (ODFW 2010a), wolves involved in chronic depredation may be killed by ODFW, ODFW authorized agents or WS personnel after confirmation by ODFW. The requester will document unsuccessful attempts to solve the situation through non-lethal means (OAR 635-110). The OAR 635-110 and the OWCMP (ODFW 2010a) provides that in Phases I and II, WS may assist ODFW with determining the cause of death in wolf damage complaints, however ODFW will make the final determination.

CHAPTER 1. PURPOSE AND NEED FOR ACTION

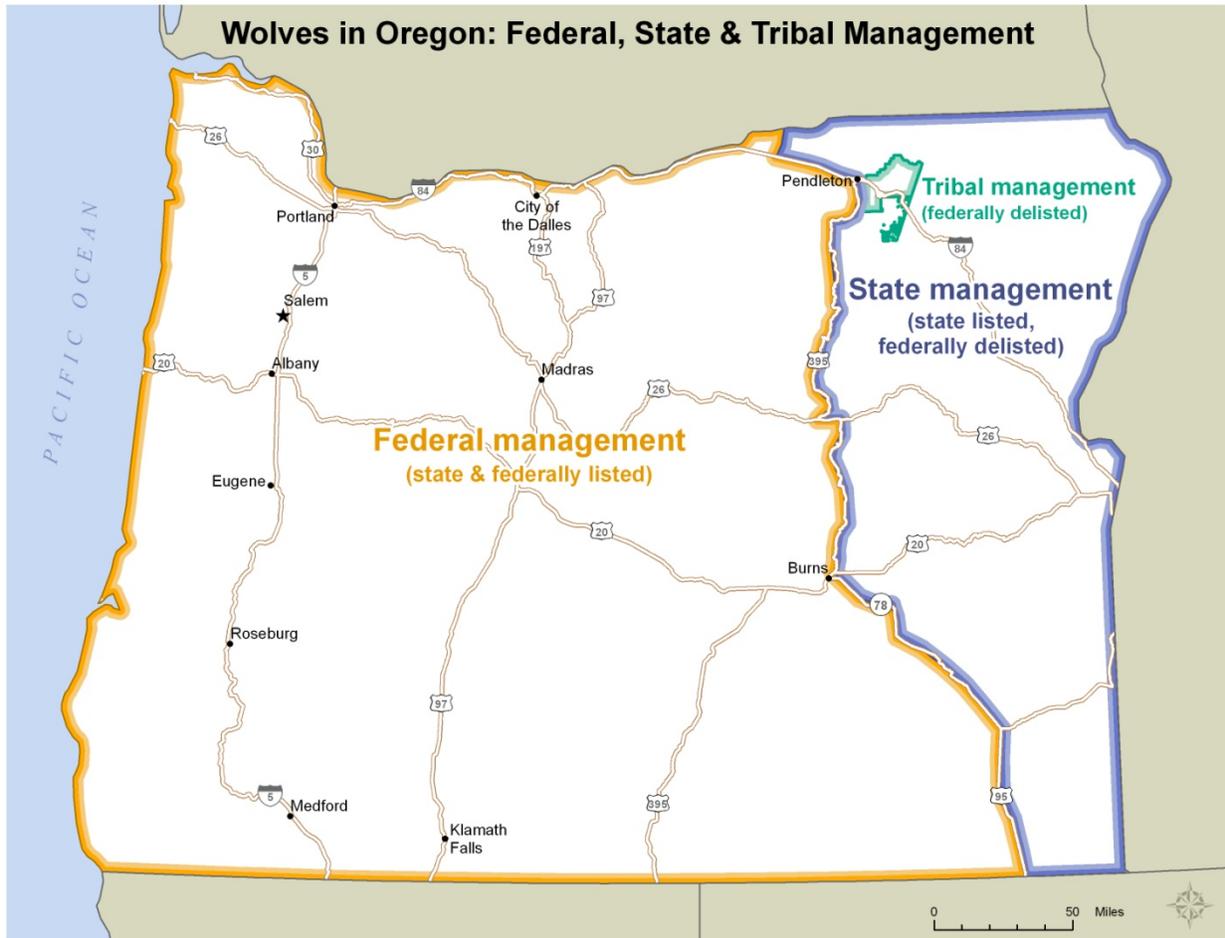


Figure 1. Map showing boundary of federal, State of Oregon, and Confederated Tribes of the Umatilla Indian Reservation wolf management jurisdictions. Wolves in the federal management zone are classified under the federal ESA as endangered. Wolves in the state and Tribal management zones (both within the NRM DPS) are federally delisted and managed accordingly.

## CHAPTER 1. PURPOSE AND NEED FOR ACTION

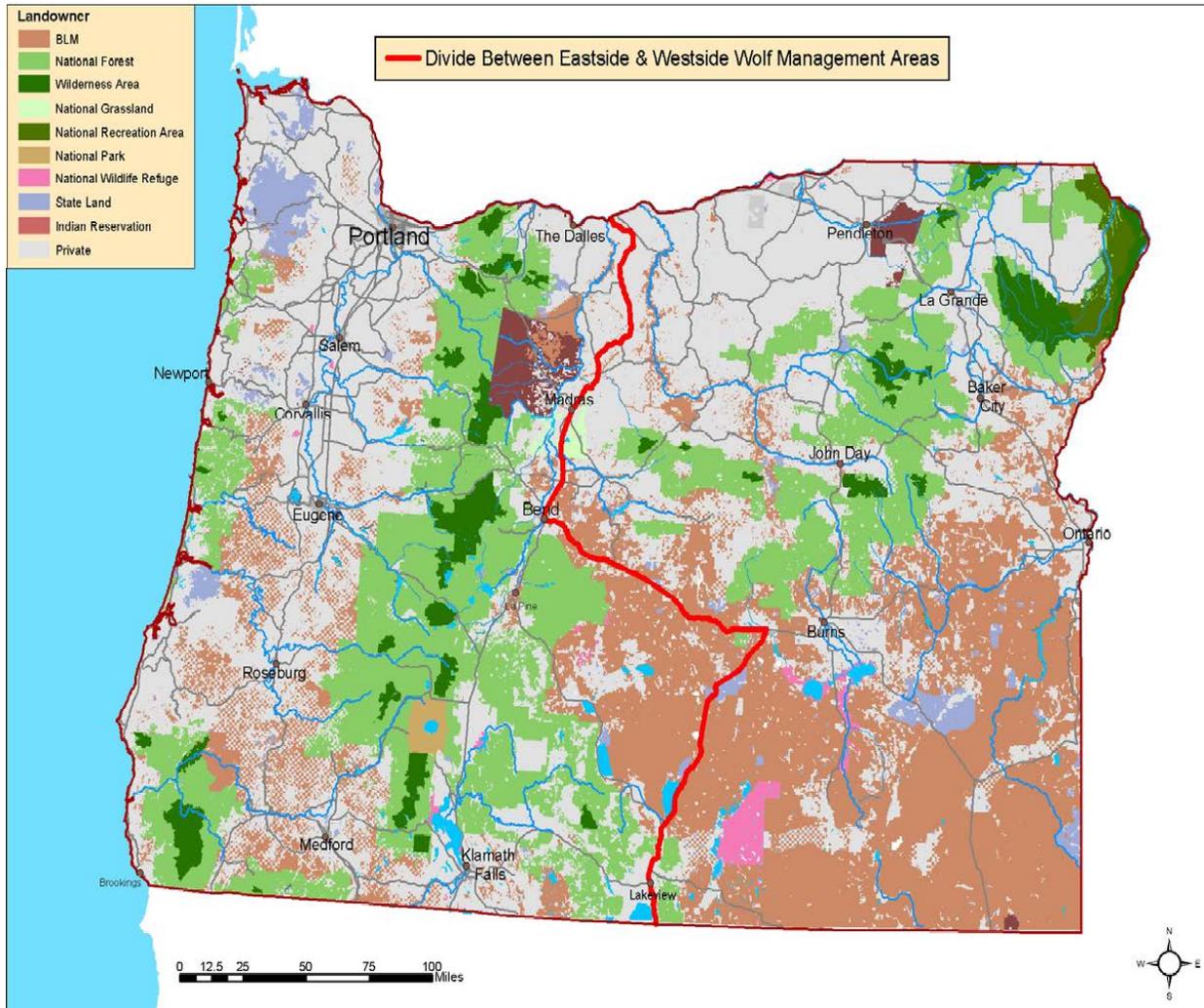


Figure 2. ODFW's eastside and westside wolf management areas, as shown by the red line, is defined by U.S. Highway 97 from the Columbia River to the junction of U.S. Highway 20, SE on U.S. Highway 20 to the junction with U.S. Highway 395, south on U.S. Highway 395 to the California border (ODFW 2010a).

## CHAPTER 1. PURPOSE AND NEED FOR ACTION

### 1.1 Purpose

#### Purpose of the Proposal

The purpose of the proposed action is to respond to ODFW requests to reduce livestock depredation by gray wolves in Oregon and on sovereign Native American tribal reservation lands, where gray wolves are not managed by the federal government under the federal ESA. Additionally, the purpose of this proposal is to be available to assist ODFW and sovereign tribal governments in the unlikely event that wolves threatened human safety. Any actions undertaken on behalf of ODFW must conform with ODFW's conservation and management objectives and goals as defined in detail in OAR 635-110 (Appendix A) and OWCMP (ODFW 2010a, Section II).

### 1.2 Need for Action

#### Direct predation on livestock

ODFW's OWCMP (ODFW 2010a) calls for recovery of wolves as a species in the State, which provides a reasonable expectation that wolves in Oregon will increase in number in the foreseeable future. Along with the expectation of increased wolf numbers is the expectation that depredation on livestock will also increase.

In Oregon, livestock depredation events (including predation and injury) by wolves have been *confirmed* by ODFW or FWS (while federally listed), in Baker, Wallowa, and Umatilla counties (ODFW 2012a):

- 2009 (April through August) – 28 lambs, 1 calf, and 1 goat
- 2010 – 8 calves
- 2011 – 7 calves, 7 cows
- 2012 (through May 31) – 4 cows, 9 sheep (3 lambs, 2 ewes, 4 rams)

Other investigations have occurred showing possible and probable, but unconfirmed, wolf kills. The criteria and numbers of investigations can be found at: [http://www.dfw.state.or.us/Wolves/livestock\\_loss\\_investigations.asp](http://www.dfw.state.or.us/Wolves/livestock_loss_investigations.asp).

#### Confirmed losses underestimate probable losses

It is important to recognize that the numbers of livestock that have been confirmed to be killed by wolves to date in Oregon may represent only the minimum numbers of livestock actually killed and injured by wolves, and that more livestock were probably killed but not confirmed as wolf predation (Bjorge and Gunson 1985, Oakleaf et al. 2003). For example, in the Order Staying Enforcement of Rule Pending Judicial Review Conditioned on Providing Security, one Oregon cattle producer declared that he suffered the loss of two pregnant cows, one bull, and two yearlings to wolves during part of a one

## CHAPTER 1. PURPOSE AND NEED FOR ACTION

year, but only two of his animals were confirmed as wolf kills (Cascadia Wildlands, et al. v. Dept. of Fish and Wildlife, et al., No. 149672 (Or. Ct. App. Nov. 15, 2011) order staying enforcement of rule pending judicial review). For the confirmed wolf kills, he received a compensation payment in the amount of \$800<sup>3</sup> but he incurred additional losses of \$6,600. Thus, this producer was compensated for about 11 % of his direct losses which totaled \$7,400.

Oakleaf et al. (2003) conducted a study on wolf-caused predation losses to cattle on U.S. Forest Service (USFS) summer grazing allotments near Salmon, Idaho, and concluded that for every calf found and confirmed to have been killed by wolves, there were as many as 8 other calves killed by wolves but not found by the producer. Bjorge and Gunson (1985) likewise recovered only 1 out of every 6.7 missing cattle during their study and suggested that wolf-caused mortalities were difficult to detect.

Confirmed incidents of wolf predation on livestock may involve only one or several livestock killed or wounded per incident, but there have also been situations where larger numbers of livestock have been killed in a single incident, particularly in the case of wolf attacks on sheep. Muhly and Musiani (2009) reviewed data on wolf predation on livestock in Idaho, Montana and Wyoming from 1987-2002 and found that while most wolf attacks on cattle involved the death of only 1 animal per incident, wolf attacks on sheep typically involved killing about 14 animals per incident, with up to 98 sheep killed in a single attack. In Oregon, one producer suffered 22 lamb losses to wolves in one day. The same producer also incurred additional lamb losses and the loss of a goat in the days and months that followed, all by the same wolves (ODFW 2012a).

ODFW requires a standard of conclusive evidence before wolf-caused livestock depredations are confirmed (ODFW 2010b). In many cases, wolves may have been responsible for the death of a rancher's livestock, but there was insufficient evidence remaining to confirm wolf predation. In some cases, those portions of the livestock carcass that might have contained the evidence of predation may already have been consumed, carried off, or decomposed. Some of these incidents might be classified as "probable" predation, depending on other evidence that might still remain. But in many cases, there may be little or no conclusive evidence of predation, other than the fact that wolves are known to be in the area and some livestock have seemingly just disappeared.

As wolf populations increase and expand their range, local decision makers must choose management strategies that balance competing needs for wolf protection and the reduction of wolf-caused damage (Mech 2001). Wolves prey on domestic animals in all parts of the world where the two coexist (Mech and Boitani 2003, OWCMP 2010a.). Data from the Northern Rocky Mountain Recovery Area suggest that individual wolves do not automatically prey on livestock, but members of wolf packs encountering livestock on a regular basis are likely to depredate sporadically (Bangs and Shivik 2001).

---

<sup>3</sup> Compensation was provided by a Defenders of Wildlife fund which is no longer in effect.

## CHAPTER 1. PURPOSE AND NEED FOR ACTION

The relative risk of predation on livestock posed by individual wolves was analyzed by WS for Idaho (USDA 2011a). The authors measured the likelihood for depredation to occur from wolves, black bears, cougars and coyotes and showed that individual wolves were more likely to depredate on sheep and cattle than individual coyotes, bears and cougars (Collinge 2008).

Where and how livestock are managed and where and how wolves are managed will influence depredation rates. In Alberta, Canada, cattle on heavily forested but less intensively managed grazing allotments suffered three times as many depredation incidents as more intensively managed lease areas having less forest cover (ODFW 2010a). In North America and Europe, untended livestock occupying remote pastures suffered the greatest losses from wolves. Newborn livestock held in remote pastures are more vulnerable to wolf predation. Where and how livestock are managed and where and how wolves are managed will influence depredation rates (ODFW 2010a).

### Indirect depredation effects on livestock

Although direct losses of livestock due to predation are often conspicuous and economically significant to affected producers, they likely underestimate the total impact on producers because they do not consider indirect effects as a result of livestock being exposed to the threat of predation (Howery and DeLiberto 2004, Lehmkuhler et al. 2007). Shelton (2004) suggested that the value of livestock killed by predators is the “tip of the iceberg” in assessing the actual costs that predators impose on livestock and producers including time and effort spent looking for missing livestock, and increased costs associated with efforts to mitigate predation which may include night confinement, improved fencing, additional livestock guarding animals, early weaning, choice of grazing area, and/or increased feeding costs related to loss of grazing acreage.

Using the example of the producer in Oregon who incurred \$7,400 in direct cattle losses (Cascadia Wildlands, et al. v. Dept. of Fish and Wildlife, et al., No. 149672 (Or. Ct. App. Nov. 15, 2011) order staying enforcement of rule pending judicial review), increased labor and other costs brought his economic impact from wolves during a portion of one year to over \$18,000. Indirect costs are not included in compensation payments, therefore, when considering his compensation payment of \$800 for a portion of his direct losses, this producer was compensated for only about four percent of his total (direct and indirect) losses. In another example (Cascadia Wildlands, et al. v. Dept. of Fish and Wildlife, et al., No. 149672 (Or. Ct. App. Nov. 15, 2011) order staying enforcement of rule pending judicial review), a cattle producer which estimated \$4,900 in cattle losses to wolf depredation, (not including lost profits), also incurred additional management costs of \$19,000. These examples illustrate the severity of indirect economic consequences that wolf depredation and threats can have on individual livestock operations.

## CHAPTER 1. PURPOSE AND NEED FOR ACTION

Indirect impacts to livestock arise from the stress and disruption associated with the presence of wolves or wolves pursuing herd mates. Effects on livestock may include reduced weaning weights, increased cattle aggressiveness, and delayed rebreeding, as well as increased production costs associated with an increased level of vigilance, alteration of pasture rotation and turnout timing, and handling costs. Harassment by predators may directly cause livestock to lose weight due to increased energy expenditure associated with running and loss of sleep, but may also indirectly reduce the ability of ruminants to convert plant nutrients into weight gain due to decreased rumination time (Howery and DeLiberto 2004). Cattle and sheep exposed to harassment by predators become very skittish and spend much of their time remaining vigilant for predators (Kluever et al. 2008). They do not disperse and feed normally, and therefore may not take in the quantity and quality of feed they would have if unstressed, resulting in reduced weight gains at the end of the grazing season (Muhly et al. 2010). In addition, cattle are sometimes stampeded through fences and injured when wolves chase them (Lehmkuhler et al. 2007). Lehmkuhler et al. (2007) also suggested that wolves could stress cattle by chasing them repeatedly which can also cause cattle to abort calves, calve early or give birth to a weak calf.

### Wolf predation on dogs

As wolves expand their range in Oregon, dog owners will need to be aware of the potential risks to their animals. Areas or situations where wolves and domestic dogs encounter each other can result in dog mortality. In some instances, wolves may alter their regular movements or activities to seek out and confront domestic dogs (ODFW 2010a). In Wisconsin, wolf depredation on hounds used for black bear hunting resulted in more compensation payments than for livestock (Treves et al. 2002). In Minnesota, 25 dogs were reported killed by wolves in 1998 alone (Bangs and Shivik 2001, Mech and Boitani 2003). The killing of guard dogs by wolves has been documented in the Rocky Mountain Recovery Area. However, guard dogs appear to be more effective and less at risk when an adequate numbers of dogs per herd are present coupled with the presence of trained herders. Livestock producers using working dogs in conjunction with trained herders face added costs to protect their livestock from potential wolf depredation. Working dogs and trained herders may be more effective for protecting sheep flocks than cattle (ODFW 2010a).

In Oregon, some wolves are likely to occupy areas near human habitation or areas used for recreation which could put pets or working dogs at risk. Dogs working cattle or sheep could be vulnerable in these situations. Public education will be important in preventing wolf/domestic dog interactions. Livestock guarding and herding dogs are often highly valued animals, both from a monetary standpoint and in terms of the human-social bond. Individual livestock guarding dogs may be worth more than \$1,000 each.

To date, no working dogs have been confirmed as lost due to a wolf attack in Oregon, however, as wolf numbers increase, potential conflicts could be expected.

## CHAPTER 1. PURPOSE AND NEED FOR ACTION

### 1.3 Scope of Analysis – Location and Actions Analyzed

#### Location

The location for immediate action for wolf management activities is within the Oregon portion of the NRM DPS which is defined as the area east of the centerline of Highway 395 and Highway 78 north of Burns Junction and that portion of Oregon east of the centerline of Highway 95 south of Burns Junction (Figure 1). Presently, wolves are known to occur in Wallowa, Baker, Union and Umatilla Counties. ODFW has received reports of sightings in all counties in eastern Oregon (R. Morgan pers. comm., February 27, 2012). Wolf damage management may occur as requested by ODFW or sovereign tribal governments wherever confirmed chronic depredations arise within the boundary described as the NRM DPS in Oregon, or where wolves are no longer protected by the federal ESA. To date, CTUIR is the only tribal government that has requested to have assistance with wolf depredation on livestock. The location of the reservation is shown in Figure 1.

Wolf depredation management actions to assist ODFW or sovereign tribal governments are currently expected to occur in very limited and isolated geographic locations because wolves are not yet numerous and widely distributed in Oregon, and thus resultant conflicts have been relatively few, compared with conflicts in other states or by other predators in Oregon. Even when wolf numbers increase, lethal removals would be limited to those constraints presented by OAR 635-110 (Appendix A) and OWCMP (ODFW 2010a) and or by CTUIR management authority.

The locations included in the analysis would include any land jurisdiction where wolves are not federally managed, at or near the depredation incident and is likely to occur on private lands, state land, CTUIR land, or federal lands including USFS or Bureau of Land Management (BLM) lands where livestock are grazed.

If wolves are removed from the federal ESA outside the NRM DPS, they would be managed by ODFW under the OWCMP (ODFW 2010a). Thus any actions allowed by the OWCMP (ODFW 2010a), as amended, would apply to wolves throughout the state. While no packs have yet become established in the Oregon Cascades, there have been confirmed sightings of individual wolves indicating expected expansion into the western two-thirds of Oregon is imminent.

#### Site Specificity

This EA analyzes the potential impacts of WS' wolf damage management on all public, tribal and private lands in Oregon where wolves are not protected under the federal ESA, where conflicts with livestock and human safety may occur. Specific locations or times where such damage will occur cannot be predicted due to the mobility and

## CHAPTER 1. PURPOSE AND NEED FOR ACTION

unpredictability of wolves, and the distribution of livestock across the Oregon landscape. Therefore, *this EA anticipates all substantive environmental issues that are likely to exist where wolf damage management may occur.* The WS Decision Model (Slate et al. 1992) is the site-specific mechanism for determining the most appropriate actions to take within the scope of actions allowed under any NEPA decision (see Chapter 3 for a description of the Decision Model). Any substantive new issue or change in circumstance that might arise with wolf damage management which has not been considered in this EA may require additional NEPA compliance. Therefore this EA meets the intent of NEPA with regard to site-specific analysis.

### Actions Analyzed

This EA evaluates WS proposed actions to assist ODFW in providing advice, information, and direct assistance to livestock producers with non-lethal methods that can be used to aid in wolf conflict prevention, and to lethally remove wolves at ODFW's request if they have been confirmed as having caused chronic livestock depredation. Chronic depredation is defined in OAR 635-110 (Appendix A) as (i) Two confirmed depredations by wolves on livestock in the area; or (ii) One confirmed depredation followed by three attempted depredations (testing or stalking) in the area. WS will also provide assistance to CTUIR in conducting lethal removal of wolves confirmed as having caused chronic livestock depredation or as authorized, and by providing nonlethal technical assistance. WS also proposes to assist ODFW and sovereign tribal governments by using its expertise to determine whether or not wolves were responsible for depredation. Other than on sovereign tribal lands, only ODFW can make the final confirmation of chronic livestock depredation. In addition, livestock producers, their agents or grazing permittees, may remove wolves under permits from ODFW (OAR 635-110). WS may act as an authorized agent on a depredation permit, to remove gray wolves under ODFW permit conditions for livestock producers or permittees. The specific non-lethal and lethal measures to reduce wolf conflicts are discussed in detail in the Sections 2.2 and 2.3.

A critical factor guiding this analysis is that WS wolf damage management activities would be conducted only at the request of the ODFW, affected property owners, and tribal governments. With the exception of sovereign tribal lands, *any order for lethal removal of wolves can only be made by ODFW.* WS has no decision making authority for where or when to remove problem wolves when acting at the request of ODFW or ODFW authorized depredation permit holders. WS can only decide if it will accept ODFW's and or CTUIR request to remove problem wolves. Wolf management strategies are established in OAR 635-110 and OWCOMP (ODFW 2010a) to ensure conservation and management goals will be met, therefore, any action selected must fall within those allowed under OWCOMP (ODFW 2010a) and OAR 635-110, or as it is updated. As discussed under the proposed action, on tribal lands WS would conform to similar implementation guidelines for the management of wolf depredation including limitations on the lethal removal of wolves.

## CHAPTER 1. PURPOSE AND NEED FOR ACTION

ODFW has clearly indicated that it will remove problem wolves in the absence of assistance from WS (Appendix B). Similarly, CTUIR has indicated that it would remove problem wolves if necessary (Appendix B). Requests for assistance by other sovereign tribal governments in the foreseeable future are possible but not highly likely. Therefore the actions analyzed in this EA are weighed against the environmental baseline or the environmental status quo of wolf depredation management by the responsible wildlife management agencies.

### 1.4 ODFW Wolf Management Goals and Objectives

For the purposes of this EA, any APHIS-WS actions must abide by limitations set forth in OWCMP (ODFW 2010a) and OAR 635-110. While sovereign tribal governments may request wolf damage management, any work performed by WS on tribal lands would conform to tribal regulations as well as to similar implementation guidelines outlined in OWCMP (2010a) and OAR 635-110 (Appendix A), as amended.

**Managing livestock conflicts:** ODFW's objectives for addressing wolf damage to livestock, as stated in the 2010 OWCMP (ODFW 2010a), are to develop and implement a phased approach based on population objectives for wolves that ensures conservation of the species while minimizing conflicts with livestock.

**Managing wolf populations:** ODFW's wolf population objectives are separated into two regions, ODFW's east management zone and west management zone (as defined by a dividing line of U.S. Highway 97, U.S. Highway 20, and U.S. Highway 395 Figure 2). A portion of ODFW's east management zone falls outside the NRM DPS, as well as the entire west management zone, and is currently under federal ESA rules until delisted and full management authority turned over to the State. Population objectives will be met through three management phases. Phase I focuses on reaching the conservation objective. Phase II focuses on reaching the management objective and in Phase III, continuing the management objective while balancing the wolf population with their potential conflicts, OWCMP (2010a, Ch. II, B).

For wolves in ODFW eastern management zone, the population objective for *conservation* (Phase I) is for four breeding pairs of wolves present for three consecutive years. The *management* population objective (Phase II) is for seven breeding pairs of wolves present for three consecutive years. A breeding pair is defined by an adult male and adult female with at least two pups surviving to the end of December. Wolves in the conservation stage will be protected under the State ESA. When in Phase II, ODFW would manage wolves so that the populations do not decline.

Following any federal delisting, wolves in Oregon's west management zone and the portion of the east management zone outside the NRM DPS will be managed under a regime that replicates Oregon ESA protections with a population objective of four

## CHAPTER 1. PURPOSE AND NEED FOR ACTION

breeding pairs of wolves present for three consecutive years, and management population objective of seven breeding pairs of wolves present for three consecutive years.

Meeting the delisting criteria outlined in OWCMP (ODFW 2010a) will necessitate tolerance for wolves on both public and private lands. Therefore, to achieve conservation of wolves in Oregon as required by the state ESA, OWCMP outlines a range of options for livestock producers to deal with problem wolves. While OWCMP describes measures that ODFW will take to conserve and manage the species, it provides for both non-lethal and lethal management strategies that could be taken to protect livestock from wolf depredation and address human safety concerns. These measures are outlined in Section 2.3 and fully detailed in the OAR 635-110 (Appendix A) and OWCMP (2010a, Ch. III).

### **1.5 Period for which this EA Remains Valid**

This EA may remain valid through ODFW's gray wolf Conservation and Management Phases I and II (ODFW 2010a and OAR 635-110, as amended), and until WS, in consultation with ODFW and affected sovereign tribal governments, determines that the need for action, issues driving this EA, environmental conditions, or wolf management plans have changed substantially<sup>4</sup>. Substantive changes may trigger the need to review and amend the analysis in this EA, further involve the public, and provided the decision-maker with additional information necessary to make an informed decision about WS' role in wolf damage management in Oregon. The need for action to protect livestock from wolf predation, as described in Sections 1.2.2 and 1.2.3, would be expected to increase over time as Oregon's wolf populations grow and expand. OWCMP (ODFW 2010a) uses adaptive management to incorporate new information into ODFW's management schemes which may affect when and where WS would take actions. WS would follow this adaptive management scheme by adjusting to the changes. Wolf management as conducted by ODFW is expected to continue into the foreseeable future and result in an eventual State delisting.

### **1.6 Decision to be Made**

Based on agency relationships, Memoranda of Understanding (MOUs) and legislative direction, WS is the lead agency for this EA, and therefore responsible for the scope, content and decisions made. The ODFW has cooperated in the development of the EA, and the USFS, BLM, Oregon Department of Agriculture (ODA), Burns Paiute Tribe, Klamath Tribes, The Confederated Tribes of the Umatilla Reservation, and the

---

<sup>4</sup> OAR 635-110 and OWCMP (635-110) describe wolf damage management actions that ODFW may authorize during Phase III of wolf management. WS is not proposing to participate in lethal wolf damage management actions during Phase III.

## CHAPTER 1. PURPOSE AND NEED FOR ACTION

Confederated Tribes of Warm Springs Reservation have all had opportunity for input during preparation of the EA.

Based on the scope of this EA, the decisions to be made are:

- Should the Oregon WS program respond to ODFW requests for assistance with Phase I and II wolf damage management activities as authorized by OAR 635-110 (Appendix A) and OWCMP (ODFW 2010a) as well assisting CTUIR and other sovereign tribal governments?
- Might there be other reasonable alternatives that could be selected?
- What are the likely environmental effects of the alternatives, and could the proposed action have significant effects on the quality of the human environment and therefore require preparation of an EIS?

### **1.7 Summary of Public Involvement Efforts**

Scoping, agency, and public input in the NEPA process for this EA were conducted consistent with WS NEPA procedures. Issues related to the proposed action were identified from: cooperating agency input from ODFW, including the OWCMP (ODFW 2010a); prior WS experience with wolf management issues in other states (USDA 2011a, USDA 2008, and USDA 2006), agency knowledge of wolf damage management issues in Oregon, interagency and tribal reviews of the draft EA.

The July 2012 pre-decision EA and public comment form has been made available to the public by posting the notice of their availability on the WS website at [http://www.aphis.usda.gov/wildlife\\_damage/nepa.shtml](http://www.aphis.usda.gov/wildlife_damage/nepa.shtml), and by issuing a legal notice in the Statesman's Journal on August 1, 2012. All substantive comments received according to the instructions provided in the notices will be considered in decision resulting from this EA. All individuals who provide a mailing address will receive a direct notice of the decision.

### **1.8 Relationship of this EA to other Environmental Documents**

#### Final Rule to Delist NRM DPS

On May 5<sup>th</sup>, 2011, USFWS published a final rule to remove protections of the ESA from most of the concurrently designated NRM gray wolf DPS (74 FR 15123). The population of wolves in the eastern one third of Oregon was included in this delisting, as they were part of the NRM DPS. Background information on the NRM gray wolf

## CHAPTER 1. PURPOSE AND NEED FOR ACTION

population was contained in the USFWS April 2, 2009, Final Rule (74 FR 15123) <http://www.regulations.gov><sup>5</sup>

### 2010 Oregon Wolf Conservation and Management Plan and OAR 635-110, as amended

The OWCMP (ODFW 2010a, [http://www.dfw.state.or.us/Wolves/management\\_plan.asp](http://www.dfw.state.or.us/Wolves/management_plan.asp)) provides relevant discussions which are summarized herein. The relationship of the OWCMP (ODFW 2010a, as amended) to this EA is that it provides the framework and basis for describing the existing environment and no action alternative, and it sets parameters and limitations on the proposed action. The proposed action and no action alternatives are consistent with ODFW management goals and objectives, as specified in OWCMP (ODFW 2010a) and OAR 635-110.

### Wildlife Services Programmatic Final Environmental Impact Statement

WS issued a Final EIS on the national APHIS-WS program and Record of Decision published in 1995. The FEIS received minor updates in 1997 (USDA 1997). Relevant information available in the EIS has been incorporated by reference into this EA.

### Final EIS on the Reintroduction of Gray Wolves to Yellowstone National Park and Central Idaho

The USFWS (1994) issued a Final EIS and Decision regarding the potential impacts of reintroducing wolves to YNP and central Idaho. Part of the analysis in the EIS assessed potential impacts of a fully-recovered wolf population on livestock. This EIS also assessed the anticipated impact of wolf removals for protection of livestock. Relevant analysis from USFWS (1994) is incorporated by reference in this EA.

## **1.9 Authority and Compliance**

WS cooperates with land and wildlife management agencies to resolve wildlife damage problems in compliance with applicable federal, state and local laws.

### **1.9.1 Authority of Federal and State Agencies in Wolf Management**

#### APHIS-Wildlife Services

---

<sup>5</sup> Lawsuits challenging the USFWS April 2, 2009, final rule were filed in U.S. District Court for the District of Montana and U.S. District Court for the District of Wyoming. On August 5, 2010, the U.S. District Court for the District of Montana vacated and set aside our 2009 delisting rule (*Defenders of Wildlife et al. v. Salazar et al.*, (729 F. Supp. 2d1207 (D. Mont.)). On April 15, 2011, President Obama signed Public Law 112-10—The Department of Defense and Full-Year Continuing Appropriations Act, 2011. Section 1713 of Public Law 112-10 which required the Secretary of the Interior to reissue the final rule published on April 2, 2009 (74 FR 15123 *et seq.*), and that the reissuance could not be subject to judicial review.

## CHAPTER 1. PURPOSE AND NEED FOR ACTION

The WS program is authorized to carry out wildlife damage management programs necessary to protect the Nation's agricultural and other resources. The primary statutory authorities are the Act of March 2, 1931 (46 Stat. 1468; 7 U.S.C. 426-426b) as amended, and the Act of December 22, 1987 (101 Stat. 1329-331, 7 U.S.C. 426c). WS recognizes that wildlife is an important public resource greatly valued by the American people. By its very nature, however, wildlife is a highly dynamic and mobile resource that can damage agricultural resources, pose risks to human safety, and affect other natural resources. The WS program provides federal leadership in helping to solve problems that occur when human activity and wildlife are in conflict with one another.

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

The ODFW has the authority to manage all wildlife in Oregon, except federally listed threatened and endangered (T&E) species, regardless of the land class on which the animals are found (ORS 496.012, 496.118). It is the policy of the State of Oregon (ORS 496.012 Wildlife Policy) that wildlife shall be managed to prevent serious depletion of any indigenous species and to provide the optimum recreational and aesthetic benefits for present and future generations of the citizens of this state. In part, this policy states that the OFWC shall represent the public interest of the State of Oregon and: maintain all species of wildlife at optimum levels; regulate wildlife populations and the public enjoyment of wildlife in a manner that is compatible with primary uses of the lands and waters of the state; and make decisions that affect wildlife resources of the state for the benefit of the wildlife resources and to make decisions that allow for the best social, economic and recreational utilization of wildlife resources by all user groups.

### Oregon State Police – Fish and Wildlife Division (OSP)

The purpose of the Fish and Wildlife Division of the OSP is to ensure compliance with the laws and regulations that protect and enhance the long term health and equitable utilization of Oregon's fish and wildlife resources and the habitats upon which they depend.

### Oregon Department of Agriculture (ODA)

The Oregon Department of Agriculture aids citizens in resolving certain types of conflicts with wildlife. The ODA currently has a Cooperative Agreement, and Annual Work plan with WS. These documents establish a cooperative relationship between WS and ODA, outline responsibilities, and set forth annual objectives and goals of each agency for resolving wildlife damage issues in Oregon.

## CHAPTER 1. PURPOSE AND NEED FOR ACTION

### United States Forest Service (USFS)

The USFS has the responsibility to manage National Forests for multiple uses including livestock grazing, timber production, recreation, and wildlife habitat, while recognizing the state's authority to manage resident wildlife. The USFS recognizes the importance of managing wildlife damage on lands and resources under their jurisdiction, as integrated with their multiple use responsibilities. WS coordinates work activities with USFS through annual work planning processes. In this way, the USFS and WS ensure that proposed wildlife damage management activities are consistent with forest land uses as allowed under its Land and Resource Management Plans, or Forest Plans.

### United States Bureau of Land Management (BLM)

The BLM manages lands under its jurisdiction for multiple uses including livestock grazing, recreation, wildlife habitat, and other uses while recognizing the state's authority to manage resident wildlife. The BLM recognizes the importance of managing wildlife damage on lands and resources under its jurisdiction, as integrated with its multiple use responsibilities. WS coordinates work activities with BLM through annual work planning processes. In this way, the BLM and WS ensure that proposed wildlife damage management activities are consistent with BLM Resource Management Plans.

### **1.9.2 Compliance with Federal and State Laws, Policies and Executive Orders**

Several federal and state laws regulate wildlife damage management. WS complies with relevant federal and state laws, and consults and cooperates with other agencies as appropriate.

### National Environmental Policy Act (NEPA)

NEPA requires that federal actions be evaluated for environmental impacts, that these impacts be considered by the decision maker(s) prior to implementation, and that the public be informed. This EA has been prepared in compliance with NEPA (42 USC Section 4231, et seq.); the President's Council on Environmental Quality (CEQ) Regulations, (40 CFR Section 1500 – 1508), and USDA APHIS NEPA Implementing Regulations (7 CFR Part 372).

One purpose of any EA is to “. . . briefly provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact” (40 CFR 1508.9). If the environmental impacts are found to be significant, the NEPA process would likely be continued and an EIS would be prepared. If the impacts of the proposal are not found to be

## CHAPTER 1. PURPOSE AND NEED FOR ACTION

significant on the human environment, a Finding of No Significant Impact and decision to implement a selected alternative may be issued.

### Federal Endangered Species Act

It is federal policy, under the ESA, that all federal agencies shall seek to conserve endangered and threatened species and shall utilize their authorities in furtherance of the purposes of the ESA (Sec.2(c)). Section 7 consultations with the USFWS are conducted to use the expertise of the USFWS to ensure that "any action authorized, funded, or carried out by such an agency . . . is not likely to jeopardize the continued existence of any endangered or threatened species. WS conducts Section 7 Consultations with the USFWS when proposed actions may affect federally listed species.

### Oregon Endangered Species Act

The Oregon ESA (ORS 496.171 to 496.192 and 498.026) provides protection for all native species listed under the Federal ESA, plus any additional native species determined by the appropriate state agency to be in danger of extinction throughout any significant portion of its range within the state.

The reach of the state ESA is different than that of the federal ESA for the purposes of this proposal in that recovery mechanisms are limited to state-owned or leased lands, and lands over which the state has a recorded easement. In addition, endangered species management planning is limited to state agencies.

### ODFW - Wildlife Policy (ORS 496.012)

It is the policy of the State of Oregon that wildlife be managed to prevent serious depletion of any indigenous species and to provide the optimum recreational and aesthetic benefits for present and future generations of the State. Included in this wildlife policy is maintaining all species of wildlife at optimum levels.

### Executive Order (EO) 13045 - Protection of Children from Environmental Health and Safety Risks

Children may suffer disproportionately from environmental health and safety risks for many reasons. Wolf damage management as proposed in this EA would only involve legally available and approved damage management methods in isolated or remote situations and otherwise under circumstances where it is highly unlikely that children would have an opportunity to be exposed and potentially be adversely affected. Therefore, implementation of the proposed action would not increase environmental health or safety risks to children.

## CHAPTER 1. PURPOSE AND NEED FOR ACTION

### U.S. Forest Service

Under the Act of 1932, as amended, (7 U.S.C. 426-426c), the USFS and APHIS-WS, along with the states, cooperate to manage animal damage on National Forest System lands. Under the framework of a 2011 MOU between the USFS and APHIS-WS, WS is designated as the lead agency concerning animal damage management activities involving predators on National Forest System lands. This includes a responsibility to maintain technical expertise in the science of animal damage management, control tools and techniques, conducting management programs, and complying with the NEPA for activities related to predator damage management.

The USFS is responsible for the management of land and resources under its jurisdiction. The MOU directs the USFS to coordinate with APHIS-WS in the development and annual review of wildlife damage management plans governing WS' activities on National Forest System lands and to cooperate in WS' NEPA processes.

### Bureau of Land Management

Under the Act of 1931, as amended, (7 U.S.C. 426-426c), BLM and APHIS-WS, along with the states, cooperate to manage animal damage on BLM lands. Similar to the USFS, BLM and WS have entered into a MOU which identifies the roles and responsibilities of each agency in animal damage management operations and coordination, and NEPA compliance. The BLM is responsible for the management of land and resources under its jurisdiction and for conducting non-predator control operations on its' lands, including NEPA compliance on these activities. The MOU directs BLM to coordinate with WS in the development and annual review of animal damage management work plans governing WS' activities on BLM lands and to cooperate in WS NEPA processes.

### Migratory Bird Treaty Act

The Migratory Bird Treaty Act provides the USFWS regulatory authority to protect species of birds that migrate outside the United States. All cooperating agencies coordinate with the USFWS on migratory bird issues. Migratory birds are not expected to be affected by this proposal for the reasons discussed in Chapter 4, effects on non-target species.

### Bald and Golden Eagle Protection Act

This law provides special protection for bald (*Haliaeetus leucocephalus*) and golden (*Aquila chrysaetos*) eagles. Similar to the Migratory Bird Treaty Act, it prohibits any "take" of these species, except as permitted by the USFWS. WS

## CHAPTER 1. PURPOSE AND NEED FOR ACTION

expects to have no effect on bald or golden eagles, for the reasons discussed in Chapter 4, effects on non-target species.

### National Historic Preservation Act (NHPA) of 1966, as amended

The NHPA requires federal agencies to: 1) evaluate the effects of any federal undertaking on cultural resources, 2) consult with the State Historic Preservation Office regarding the value and management of specific cultural, archaeological and historic resources, and 3) consult with appropriate American Indian tribes to determine whether they have concerns for traditional cultural resources in areas of these federal undertakings. We have determined that the proposed action is not a federal “undertaking” as defined by NHPA and would not affect cultural resources.

### EO 12898 - Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

Environmental Justice (EJ) promotes the fair treatment of people of all races, income and culture with respect to the development, implementation and enforcement of environmental laws, regulations and policies. Fair treatment implies that no person or group of people should endure a disproportionate share of the negative environmental impacts resulting either directly or indirectly from the activities conducted to execute this country's domestic and foreign policies or programs. All WS activities are evaluated for their impact on the human environment and compliance with EO 12898 to ensure EJ. WS personnel use wildlife damage management methods as selectively and environmentally conscientiously as possible. No pesticides are proposed for use. It is not anticipated that the proposed action would result in any adverse or disproportionate environmental impacts to minority or low-income persons or populations.

### Fish and Wildlife Act of 1956 (section 742j-1) Airborne Hunting

This Act, approved in 1971, was added to the Fish and Wildlife Act of 1956 and is commonly referred to as the Airborne Hunting Act or Shooting from Aircraft Act. The Act allows shooting animals from aircraft for certain reasons including protection of wildlife, livestock and human life as authorized by a federal or state issued license or permit. USFWS regulates the Airborne Hunting Act but has given implementation to the states. ODFW or its agent is authorized to conduct aerial shooting as described under this proposal according to Oregon Statute on Hunting from Aircraft ORS 498.126 (4)(a).

## CHAPTER 2. DESCRIPTION OF ALTERNATIVES

Wildlife Services (WS) has been requested by ODFW and CTUIR to assist each of their respective agencies with managing wolves and wolf damage. Without WS assistance, wolf damage management will be implemented by ODFW according to the OWCMP (ODFW 2010a), as clearly expressed in a March 28, 2012 letter from Ron Anglin, Division Administrator, Wildlife Division, Department of Fish and Wildlife (Appendix B). Similarly, wolf damage management will be implemented by CTUIR (Appendix B). Therefore, WS has three viable choices at this time which WS can select in response to the requests from both entities to meet their needs in addressing wolf damage management. WS can provide: a minimum level of assistance already being conducted; a full range of non-lethal only assistance; or assist CTUIR and the State with a range of non-lethal and lethal actions in the manner described in OAR 635-110 (Appendix A) and OWCMP (ODFW 2010a) or under sovereign tribal authority. Within the limited decision space afforded WS by the OWCMP (ODFW 2010a), WS has no regulatory authority or latitude to implement other approaches, nor can it require alternative actions of ODFW. The three alternative courses of action, as detailed in the following pages, are: No Action (WS would take no additional action over current depredation investigations and recommendations for non-lethal controls); Nonlethal Methods Only, which would allow WS to implement non-lethal wolf damage management in addition to conducting depredation investigations and making recommendations for non-lethal management; and thirdly, the Proposed Action, an integrated approach in which a combination of nonlethal methods, and when necessary, lethal methods could be used, as prescribed in OWCMP (ODFW 2010a) or under sovereign tribal authority.

### 2.1 Alternative 1 - No Action

The “No Action” Alternative is the absence of additional actions by WS for wolf management, or no change from the current program. This is the *environmental status quo*, a required NEPA component, a viable alternative that could be selected, and serves as a baseline for comparing the action alternatives (CFR 1502.14[d]). Under this alternative, WS would continue its current activities conducting investigations of livestock conflicts, and provide the public with advice and recommendations on the appropriate use of non-lethal methods to protect livestock from wolf damage.

Wildlife Services conducts routine livestock damage investigations and reports wolf damage to ODFW and or CTUIR. When mortality events are determined to be caused by predation, they are investigated further to determine the species that caused the damage. If wolves may be potentially involved, WS coordinates investigation activities with ODFW and or other appropriate agencies.

Non-lethal methods currently recommended by the WS program include: radio-activated guard (RAG) devices, non-injurious harassment, non-lethal injurious harassment, fladry, range riders, animal husbandry practices, installation of fencing, and livestock guarding

animals. These methods are described in detail in Section 2.2, Alternative 2 – Non-lethal Wolf Damage Management Methods Only.

Based on its investigation of livestock depredation incidents, WS would defer confirmed, probable, and possible wolf conflict to ODFW and tribal wildlife managers but would not provide lethal removal assistance to ODFW, tribes, or livestock producers to alleviate confirmed wolf damages. *ODFW and CTUIR have clearly stated that they would conduct the necessary actions as described in the OWCMP (ODFW 2010a) to remove chronic depredating wolves if the WS program were not available* (Appendices A and B). Therefore, the No Action Alternative must be evaluated as the conditions under which gray wolves are managed by ODFW, CTUIR, or other tribes.

The OWCMP (ODFW 2010a) and OAR 635-110 (Appendix A) describe measures the ODFW would take to conserve and manage wolves (see also Appendix B), including actions that could be taken to protect livestock from wolf depredation. The following summarizes the primary components of OWCMP (ODFW 2010a) but removes WS as an assisting agency to ODFW. While the OWCMP (ODFW 2010a) allows some of the actions to be taken by WS, WS would not participate in any lethal control actions under this “no action” alternative.

- Wolves that naturally disperse into Oregon will be conserved and managed under OWCMP (ODFW 2010a). Wolves will not be captured outside of Oregon and released in the state.
- Wolves may be considered for statewide delisting once the population reaches four breeding pairs for three consecutive years in eastern Oregon (Figure 2). Four breeding pairs are considered the minimum conservation population objective as described in OWCMP (2010a, Phase 1). OWCMP (ODFW 2010a) calls for managing wolves in western Oregon (Figure 2) as if the species remains listed until the western Oregon wolf population reaches four breeding pairs. This means, for example, that a landowner would be required to obtain a permit to use injurious harassment when addressing depredation problems.
- While the wolf remains listed as a state endangered species, OAR 635-110 and OWCMP (ODFW 2010a) allow for the following actions, which may be implemented by ODFW:
  - Wolves may be harassed (*e.g.*, shouting, firing a shot in the air) to disperse a wolf from a livestock operation or area of human activity.
  - Harassment that may cause injury to a wolf (*e.g.*, rubber bullets or bean bag projectiles) may be employed to prevent depredation, but only with an ODFW permit.
  - OAR 635-110-0010 authorizes the relocation of wolves when a wolf or wolves becomes inadvertently involved in a situation or is present in an area that could result in conflict with humans or harm to the wolf, provided that ODFW has no reason to believe that the wolf actually attacked or killed livestock or pets. Livestock producers who witness a wolf ‘in the act’ of

- attacking livestock on public or private land must have a permit from ODFW before taking any action that would cause harm to the wolf.
- When and where federally delisted, wolves involved in chronic depredation may be killed by ODFW personnel or ODFW authorized agents. However, before lethal action is taken, non-lethal methods will be employed in appropriate circumstances and unsuccessful attempts documented.
  - Once the wolf is delisted by the State of Oregon (as well as federally delisted), more options are available to address wolf-livestock conflict. While there are five to seven breeding pairs, livestock producers may kill a wolf involved in chronic depredation with a permit issued by ODFW. Five to seven breeding pairs is considered Phase II in OWCMP (ODFW 2010a).
  - In the unlikely event that a person is attacked by a wolf, OAR 635-110 and OWCMP (ODFW 2010a) describes the circumstances under which Oregon's criminal code and federal ESA would allow harassing, harming or killing of wolves where necessary to avoid imminent, grave injury. Such an incident must be reported to law enforcement officials.
  - A strong information and education program is proposed to ensure anyone with an interest in wolves is able to learn more about the species and stay informed about wildlife management activities.
  - Several research projects are identified as necessary for future success of long-term wolf conservation and management. Monitoring and radio-collaring wolves are listed as critical components of OWCMP (ODFW 2010a) both for conservation and communication with Oregonians.
  - Finally, OWCMP (ODFW 2010a) requires annual reporting to the OFWC on program implementation.

While there are differences in how livestock conflicts are addressed in the three management phases described in OWCMP (ODFW 2010a, Chapter III) from conservation to management, the differences are not great. OWCMP (ODFW 2010a) endeavors to provide as much flexibility to address conflicts as possible while wolves exist in low numbers, while still remaining focused on achieving wolf conservation goals. This incremental approach based on the current population status of wolves is designed to provide options to wolf managers, livestock producers and the public while promoting the goal of conservation for wolves. OWCMP (ODFW 2010a) and OAR 635-110 provide that ODFW can authorize the killing of wolves due to chronic livestock losses when the requester has documented unsuccessful attempts to solve wolf-livestock conflict with non-lethal methods. "Generally, non-lethal techniques should be the first choice when wolf-livestock conflicts are reported, regardless of the wolf population status" (ODFW 2010a, p. 44). Wolf managers and livestock producers are not required to exhaust all non-lethal techniques, but instead, a good faith effort to achieve a non-lethal solution is expected. In order to use the widest array of management tools available in any given management phase, livestock producers will be encouraged to employ management techniques to discourage wolf depredation, and ODFW will advise and assist in implementing such techniques.

Wolf managers working with livestock producers are encouraged to employ management techniques that have the highest likelihood of success to resolving the conflicts and that are reasonable for the individual situation. This includes the identification of unreasonable circumstances that may attract wolf-livestock conflict.

### Compensation Program for Wolf Damage

OWCMP (ODFW 2010a) described a potential wolf damage compensation program. Since then, the Oregon Department of Agriculture adopted new rules under OAR 603–019 to implement a wolf depredation compensation and financial assistance grant program. The rules became effective on December 28, 2011. Grant funds will be awarded to qualified county programs for compensation purposes for livestock depredation, and as financial assistance for wolf deterring non-lethal and management techniques. Local boards comprised of a range of interests, would make financial award decisions at the county level. ODFW would provide confirmation and other information about wolf damages. At least 30% of the grant monies are required to go towards wolf deterrent methods. The role of WS in this program would be indirect: WS would provide advice to producers on the use of non-lethal methods; and WS would investigate wolf damage incidents and report results to ODFW. ODFW makes the final determinations. No compensation programs have been established for sovereign tribal wolf damages.

## **2.2 Alternative 2 – Non-lethal Wolf Damage Management Methods Only**

Under Alternative 2, the Non-lethal Wolf Damage Management Alternative, WS would conduct investigations on wolf damage management and provide advice and assistance for non-lethal damage management methods as discussed in OWCMP (ODFW 2010a). WS would not assist ODFW or tribal governments with lethal removals of wolves as discussed in the plan. However, WS would assist ODFW and sovereign tribal governments with providing recommendations on non-lethal methods and may assist ODFW and tribes with distributing available equipment and assisting landowners with the implementation and use of those methods and devices. Non-lethal methods could include techniques that are suggested by ODFW such as radio-activated guard (RAG) devices, non-injurious harassment, non-lethal injurious harassment, fladry, range riders, animal husbandry practices (including shed lambing or bringing vulnerable animals closer to buildings and herding), installation of fencing, and livestock guarding animals. WS would still investigate wolf depredation complaints to determine if the wolves are responsible for losses. ODFW would make the final determinations for investigations under their jurisdiction (ODFW 2010a). On sovereign tribal reservation lands, WS may conduct investigation of possible wolf depredation events and will follow the tribes' protocol for making a determination. WS could assist ODFW or tribes with capturing wolves for radio-collaring for monitoring purposes and/or to enhance effectiveness of non-lethal deterrents such as the RAG devices. As stated previously, ODFW and CTUIR have the authority and intent to conduct lethal wolf damage management similar to Alternative 1 (Appendices A and B).

OWCMP (ODFW 2010a) incorporates several non-lethal strategies and places emphasis on non-lethal control techniques while the wolf is in Phase I. In Phase II, OWCMP (ODFW 2010a) transitions to a more flexible approach to depredation management following delisting. Regardless of the OWCMP (ODFW 2010a) phase, this alternative would include an active education component cooperatively employed by ODFW, tribes, and WS to educate and/or equip landowners, livestock producers and the public with tools to implement non-lethal wolf management techniques, including allowing individuals to use non-lethal but injurious actions to dissuade wolves from habituating to human presence.

Two wolf management specialist positions have been established in ODFW to monitor wolf movements and work directly with individuals who experience conflicts with wolves. OWCMP (ODFW 2010a) also provides for dissemination of wolf monitoring information to landowners, livestock producers and the public as needed to keep them informed of wolf activities and movements. ODFW and WS would promote actions of individuals to instill fear of human activities in wolves through non-injurious and injurious actions to keep them appropriately wild and minimize potential for conflict with humans. As the wolf population increases in Oregon, more options for addressing conflicts will be allowed under OAR 635-110 and OWCMP (ODFW 2010a), but WS would continue to use or recommend only non-lethal methods.

While WS would not implement or recommend any lethal management under this alternative, in situations where chronic losses are occurring, lethal actions would be implemented by ODFW and sovereign tribal authorities in early phases of wolf conservation, and by presumably landowners as well as ODFW and tribes in later stages of wolf conservation and management. While no lethal methods would be used or recommended by WS, the combination of non-lethal with lethal strategies where necessary is consistent with the conservation of wolves, and is expected to promote delisting efforts, public tolerance, management flexibility, and predation conflict resolution OWCMP (ODFW 2010a).

#### Non-lethal Methods Available to WS or ODFW Personnel, Tribes and the Public

Some wolf damage management methods are available for anyone to use. These consist of non-lethal preventive methods such as cultural practices (*e.g.*, possible changes in livestock management) and localized habitat modification (*e.g.*, clearing brush, improving fencing, etc.) on private property. Cultural practices and other management techniques are implemented by the resource owners/managers. Livestock producers and resource owners/managers are encouraged to use these methods, based on the level of risk, need and professional judgment on their effectiveness and practicality. WS' or ODFW's involvement in the use of these methods is usually limited to providing recommendations or technical assistance.

**Livestock Management Practices** are implemented to prevent or reduce wolf damage and may include approaches such as: 1) maintaining healthy, well-fed animals, 2)

properly disposing of dead livestock carcasses (*i.e.*, removal, burying, liming, or burning), 3) conducting calving or lambing operations in close proximity to the ranch headquarters, when practical, 4) penning vulnerable livestock at night where practical, 5) monitoring livestock on a regular basis to detect any disease, natural mortality, or predation, and 6) incorporating other non-lethal methods. Property owners and land managers could implement these management practices or request the assistance of other agencies or private organizations to implement them, or take no action.

**Exclusion** with some type of fence or other barrier may be used to prevent or limit access by predators to livestock pastures, calving or lambing areas, or livestock confinement areas. Where practical and cost effective, sheep, calves or other vulnerable livestock may be penned near ranch buildings at night.

**Fladry** is a form of barrier and wolf deterrent involving red flags measuring approximately 3 x 18 inches, strung about 20 inches apart, hanging from a thin rope or cord suspended about 30 inches above the ground. Fladry is installed around pastures or other areas where livestock are confined to discourage wolf access. Part of the repellency provided by fladry is probably related to the frequent human visitation required to ensure that the flags remain freely suspended and that the line is properly maintained. Like many other frightening devices, wolves eventually habituate to this deterrent, but field trials in Idaho have shown that fladry may provide deterrence for as long as 60 days (Musiani et al. 2003). Davidson-Nelson and Gehring (2010) reported that if maintained, fladry can exclude wolves from livestock for up to 75 days; however Shivik et al. (2003) found that fladry did not effectively protect bait sites from scavengers, including wolves.

**Turbo-Fladry** is very similar to regular fladry with the exception that the cord is substituted with electrified wire attached to a standard livestock electric fence generator. As wolves habituate to the fladry line and try to cross under it, the negative stimulus they receive after getting shocked by the electrified barrier can increase the amount of time the barrier may remain effective.

**Livestock guarding animals** such as large, aggressive breeds of guarding dogs (*e.g.*, Great Pyrenees, Akbash, etc.) have been used with some success to protect livestock from wolves, but multiple guard dogs work better than just one or two guard dogs (Bangs et al. 2005, Urbigkit and Urbigkit 2010). Even with 3 or more dogs present, wolves occasionally kill or severely injure livestock guarding dogs. Livestock guarding dogs are generally not killed as prey but because of interspecies aggression (Bangs et al. 2005). Other types of livestock guarding animals, such as llamas, which have been shown in some circumstances to be effective in protecting sheep from coyotes, are not as effective in deterring wolves. Wolves probably view llamas as prey, and multiple instances of wolves killing and feeding on llamas have been documented in the NRM area (USFWS et al. 2002, 2003, 2005, 2007, 2009, and 2010).

**Guarding and hazing** involves using human presence to guard an area and then using pyrotechnics or other frightening devices to frighten wolves from the site if/when they

arrive. Hazing can be used as an aversive technique, but requires that the technique be used consistently whenever the animal attempts to prey on the protected resource so they do not identify conditions when they can obtain prey without receiving a negative experience (Shivik 2004). If there are any radio-collared wolves in a pack which may pose a threat to livestock, non-lethal hazing efforts can be enhanced if the livestock producer or other personnel make use of a radio receiver to determine when wolves are near or approaching the livestock (Bangs et al. 2006). This requires diligent and persistent monitoring, but can make hazing much more effective.

**Frightening devices** are methods that usually involve lights, sound and/or motion devices designed to deter wolves from a certain area. Strobes and flashing lights, propane exploders, sirens, and various combinations of these devices have all been used in attempts to reduce livestock losses, with wide-ranging degrees of effectiveness (Linhart 1984, Andelt 1987). Animal habituation (becoming accustomed) to the stimulus is one of the primary limiting factors for repellents. Essentially, anything new or different is likely to elicit avoidance behavior by canids, but this effectiveness disappears over time. Moving the devices intermittently and randomly as well as alternating the stimuli (*e.g.*, a different type of noise or light) may extend the effective period of the system (Shivik and Martin 2001). The period of efficacy may also be extended by using systems which are motion-activated or only activated when a wolf wearing a transmitter collar comes into close proximity to the protected site. The RAG box is one such frightening device that employs this approach, and RAG boxes have been field-tested in Idaho with some success (Breck et al. 2002). Use of the RAG box in Idaho has been most effective in protecting livestock in small ( $\leq 40$ -60 acre), fenced-in areas.

#### Non-lethal Methods Available to WS, Tribes, and ODFW

Some non-lethal methods, research projects and population monitoring efforts involve capture and handling wolves which may not be conducted by the general public. Methods that require capture and handling of wolves under state authority would only be conducted by ODFW personnel or agencies permitted by the ODFW. Sovereign tribal governments would act under their own authority on sovereign tribal lands.

**Foot-hold traps** can be effectively used to live capture wolves, and are an extremely important tool in wolf management. When wolves are trapped they are ordinarily physically restrained or chemically immobilized, radio-collared, and released on site, or euthanized on site. Effective trap placement, pan-tension devices and the selection and placement of appropriate lures and baits by trained personnel contribute to the foot-hold traps' selectivity. WS policy requires that foot-hold traps used for wolf damage management have offset and laminated jaws or padded jaws to reduce foot injury to captured wolves (WS Directive 2.335). Traps may also be modified with small protrusions or "nubs" on the jaws to reduce the likelihood of the wolf's foot moving back and forth in the jaws, thereby reducing the potential for trap-related injury.

Disadvantages of traps include the difficulty of keeping them operational during rain, snow or freezing weather, and the fact that they cannot be 100% selective. Although pan-tension devices are effective in reducing the likelihood of unintentional capture of non-target species smaller than wolves (*e.g.*, red fox, coyote), they cannot preclude the occasional capture of larger non-target species such as cougars or black bears. They do, however allow for the option of releasing non-target animals which may infrequently be captured. Whenever WS employees deploy traps for wolves (or other species), they post warning signs at access points into the area to alert people to the presence of traps.

**Foot snares** are devices consisting of a cable loop and a locking device that captures an animal around its foot or lower leg. The cable may be activated around the lower leg with a spring-powered throw-arm (Aldrich-type) or trap-type (Belisle) device. The foot snare can be modified with a stop on the cable to restrict the closure of the loop. Careful snare placement, pan-tension devices and the selection and placement of appropriate lures and baits by trained personnel contribute to the selectivity of this device. As with foot-hold traps, when foot snares are used as a live-capture device, wolves would ordinarily either be radio-collared and released on site, or euthanized. Foot snares are more often used for capture of cougars and black bears than for wolves.

**Drug delivery tools** are capture tools that utilize a dart or syringe filled with an immobilization drug, dispensed from a specially-designed device. These devices include hand or poll syringes, blow guns, and compressed gas or gun-powder charged systems. They would often be used on wolves when conducting live-capture operations from a helicopter. Once immobilized, the animal may be handled safely and processed for research or monitoring purposes. Use of drug delivery tools would have no effect on non-target species because positive target species identification is made before animals are darted. Thus, WS' use of these tools is expected to continue to be 100% selective for target individuals and species, and would not pose a risk to non-target species and individuals. All WS personnel who would dart wolves or deliver immobilizing drugs undergo training and maintain certification.

**Snares** can be used to live-capture animals around the neck with the use of a "stop" to prevent full closure of the loop, and improved methods for use are being developed for live-trapping wolves and other carnivores (Olson and Tischaefer 2004). Snares are ordinarily not as affected by rain, snow and freezing weather as foot-hold traps are. These devices offer a degree of selectivity based on the size of the cable loop and the height of the loop above ground level. They also offer a viable live-capture alternative to foot-hold traps during the winter months, when freezing temperatures combined with restricted blood circulation could result in damage to the wolf's foot.

#### Non-lethal Methods which may Require Special Authorization from ODFW or Tribes

Some animal behavior modification systems involve capturing and fitting wolves with radio-transmitting collars to deliver or trigger repellent stimuli (*i.e.*, aversive conditioning). Other systems sometimes referred to as "less than lethal munitions," involve shooting wolves with projectiles such as rubber bullets or bean bag rounds.

These techniques involve intentionally using painful stimuli to modify wolf behavior, and ODFW may require permits or other authorizations to use these methods and any other experimental wolf damage management techniques. Methods that require capture and handling of wolves would be conducted only by personnel from ODFW or tribes, and / or personnel authorized by either of these entities.

**Aversive Stimuli** are stimuli that cause discomfort, pain and/or an otherwise negative experience paired with specific behaviors to achieve conditioning against these behaviors. One example would be using something like a dog training shock collar that is activated when wolves come into close proximity to a protected area such as livestock pens (Shivik et al. 2003, Schultz et al. 2005).

**Non-lethal Projectile** use involves guarding an area and then using rubber bullets, bean bag rounds or other non-lethal projectiles to prevent a predation event. They can be used as an aversive technique, but require that the projectiles be used consistently whenever the predator attempts to prey on the protected resource, so it is less likely to identify conditions when it can obtain prey without receiving a negative experience (Shivik 2004). Methods which require around-the-clock presence of a person to guard the resource are most efficiently used when there are radio-collared wolves involved and the landowner/resource manager assists with the implementation. ODFW authorizes the use of these methods.

For additional discussion of the advantages and disadvantages of various non-lethal and lethal wolf damage management methods used in the NRM, see Bangs et al. (2006) ([http://www.aphis.usda.gov/wildlife\\_damage/nwrc/publications/06pubs/shivik067.pdf](http://www.aphis.usda.gov/wildlife_damage/nwrc/publications/06pubs/shivik067.pdf)).

### **2.3 Alternative 3 – Proposed Action – Integrated Wolf Damage Management**

This alternative would allow WS to both promote the use of non-lethal methods and respond to requests by ODFW to remove chronically depredating wolves as outlined in the OAR 635-110 and OWCMP (ODFW 2010a). Wolves could be removed after a request from ODFW based on confirmed livestock depredation, and after unsuccessful attempts using non-lethal methods have been documented. WS would target confirmed and chronic livestock depredating wolves during Phases I and II of gray wolf conservation and management (OAR 635-110), or under landowner “caught in the act” permits. *The proposed action encompasses all of the methods discussed in Alternative 1, and all of the non-lethal methods discussed in Section 2.2 for Alternative 2, Non-lethal Methods Only.* This alternative is consistent with actions allowed for Phases I and II under OAR 635-110 and OWCMP (ODFW 2010a), is similar to Alternative 1, No Action, except that WS would be involved with both lethal and non-lethal wolf damage management, instead of ODFW only. This alternative is also consistent with what is specified in OAR 635-110 (Alternative A) and OWCMP (ODFW 2010a).

Under the proposed action, WS may also respond to a request by any Native American Indian tribal government in Oregon where wolves are not federally managed, to manage

wolf depredation on tribal lands. WS wolf damage management on tribal lands would mirror procedures and restrictions on non-tribal lands, with the exception that tribal wildlife managers or WS may confirm wolf damages.

Lethal methods *would only be used if ordered and directed by ODFW or as an agent to an ODFW authorized permit holder, and only under those conditions described in detail in OAR 635-110 and OWCMP (ODFW 2010a)*. Additionally, lethal methods would be used on sovereign tribal lands under direction and authority of CTUIR. As per WS policy, it would only provide wolf damage management on properties after *Agreement for Control* or other work authorization documents have been completed. On federal public lands, planned activities must be included in work plans developed in coordination with each National Forest or BLM Resource Area, or in emergency, unplanned situations, in consultation with the respective USFS or BLM office. On tribal reservation lands, WS wolf depredation management would only be conducted at the request of the tribe and under individual agreements with each sovereign tribal government.

Like Alternative 2, the non-lethal only approach, a strong information and education program would be managed by ODFW with assistance from WS. This aspect would help ensure anyone with an interest in wolves is able to learn more about the species and stay informed about wildlife management activities. OWCMP (ODFW 2010a, p 79 – 81) includes examples of education on wolf management issues such as public outreach, public meetings, information on the ODFW website, training, and discussions with individuals.

Several research projects are identified as necessary for future success of long-term wolf conservation and management. Monitoring and radio-collaring wolves would be included in this alternative for conservation and communication with Oregonians. This would be handled by ODFW with assistance from WS in capturing wolves for radio-collaring.

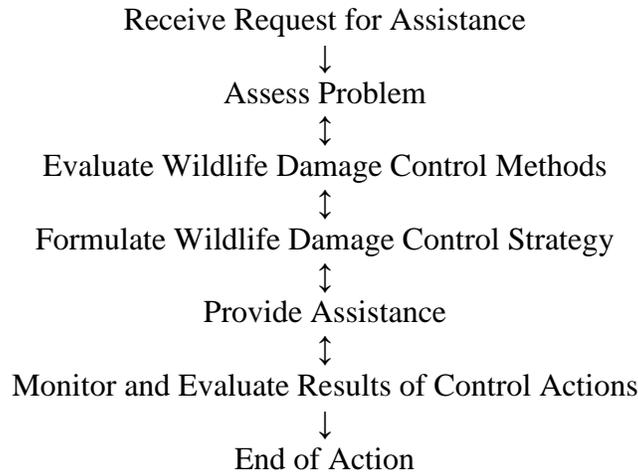
Finally, OWCMP (ODFW 2010a) requires annual reporting to the OFWC on program implementation, thus WS would provide all information on its involvement with wolf captures including capture locations, methods used, and disposition to ODFW. All wolf carcasses would be provided to ODFW for monitoring and/or research purposes.

Adaptive management would be used by ODFW to revise protocol according to changes in the phase of wolf recovery in Oregon. Over time, wolves are expected to increase in number and expand their range within Oregon, and therefore management approaches will be slightly modified as numbers increase (OWCMP 2010) (Table 1).

#### Formulating a strategy for wolf removal

Upon receiving a request to assist ODFW or tribes with capturing confirmed chronic depredating wolves, WS would use its Decision Model (Figure3) (Slate et al. 1992) to determine the appropriate method of capture based on allowable methods (foot-hold traps, foot snares, neck snares, shooting or aerial shooting) and consultation with ODFW.

**Figure 3. APHIS-WS Decision Model** (Slate et al. 1992)



In selecting appropriate management techniques, consideration is given to: whether or not a collared or breeding wolf could be affected, location and land jurisdiction; land uses (such as proximity to urban or recreation areas); possible presence of humans, pets and non-target wildlife; feasibility of implementation of the various techniques; wolf movement patterns and life cycle; local environmental conditions such as terrain, vegetation, and weather; potential legal restrictions such as availability of tools or management methods; humaneness of the available options; and costs of control options (the cost of control in this proposal may be a secondary concern because of overriding environmental, management, and legal considerations).

It is important to stress that when responding to requests from ODFW or tribes, *lethal removal of any wolf causing chronic livestock depredation would only be done after unsuccessful attempts to use non-lethal methods had been documented. While OAR 635-110 dictates this for ODFW, WS would only agree to lethal removal on tribal lands under similar restrictions.*

#### Description of Lethal Methods

These methods are specifically designed to lethally remove wolves in certain situations to stabilize, reduce or eliminate damage. The amount of removal necessary to achieve a reduction in wolf damage varies according to the effectiveness of other damage management strategies, the damage situation, and the level and likelihood of continued depredations. The lethal wolf damage management techniques that would be available to WS under Alternatives 3 would include the use of foothold traps and snares, as described above under Section 2.2, followed by euthanasia, typically by gunshot to the brain, as recommended by the American Veterinary Medical Association (AVMA 2007, Julien et

al. 2010). Additional lethal methods used under Alternatives 3 would include shooting, from the ground as well as from fixed-wing aircraft or helicopters.

**Shooting** from the ground is highly selective for the target species, and may be employed in conjunction with the use of auditory attractants (*e.g.*, sounds of prey animals in distress or imitations of wolf vocalizations). Removal of one or two specific animals by shooting in the problem area can sometimes provide immediate relief from a predation problem. Shooting is often tried as one of the first lethal management options because it offers the potential of solving a problem more quickly and selectively than some other techniques, but it requires visually sighting the wolf within effective shooting distance. Shooting may sometimes be one of the only management options available if other factors preclude the setting of equipment (*i.e.*, traps or snares).

**Aerial Shooting** typically involves visually locating suspected depredating individuals or packs from either a small single-engine fixed-wing aircraft or a helicopter, and shooting them from the aircraft with a shotgun. Shooting typically results in a relatively quick death. Depredation problems can sometimes be resolved very quickly and effectively through aerial shooting (*e.g.*, by starting the aerial operation in the vicinity of a recent wolf kill, and catching the wolf or wolves when they return to feed on the livestock carcass). Cain et al. (1972) rated aerial shooting as “very good” in effectiveness for problem solving, safety, and lack of adverse environmental impacts. Smith et al. (1986) cited cost-effectiveness and efficacy as benefits of aerial shooting.

Good visibility is required for effective and safe aerial shooting operations, and relatively clear and stable weather conditions are necessary. Summer conditions limit the effectiveness of aerial shooting because the increased vegetative cover makes finding the animals more difficult, and the higher ambient air temperatures reduce air density, which affects low-level flight safety.

Aerial shooting is one of the most effective wolf damage management tools available. In 2009, two wolves were lethally removed by WS in Oregon from aerial shooting.

**Neck snares** may be used as lethal or live capture devices. Neck snares may be used wherever a wolf moves through a restricted area (*i.e.*, crawl holes under fences, trails through vegetation, etc.). They are easier to keep operational during periods of inclement weather than are foothold traps. To date, WS has not taken any wolves with neck snares in Oregon.

**Sodium Pentobarbital** (Beuthanasia®-D) is registered for euthanasia of dogs, but may legally be used for other animals if the animal is not intended for human consumption. Barbiturates depress the central nervous system in descending order, beginning with the cerebral cortex, with unconsciousness progressing to death. The primary advantage of barbiturates is the speed of action on the animal. Barbiturates induce euthanasia smoothly, with minimal discomfort to the animal (AVMA 2007). This method of euthanasia would likely only be used in the rare circumstance where an already sedated

wolf was determined to have health or injury issues such that it would be most appropriate to euthanize the animal.

#### Measures that Minimize Environmental Risk

WS uses many standard operating procedures built into its programs which serve to minimize the potential for negative effects on the environment, including potential harm to humans and non-target wildlife. WS has obtained an Incidental Take Permit for Gray wolves from ODFW and complies with permit conditions for incidental take of wolves. While OWCMP may be updated and permit conditions can change, currently, WS standard operating procedures, OWCMP and ODFW permit conditions include, but are not limited to the following measures:

- Conspicuous, bilingual warning signs alerting people to the presence of traps and snares are placed at major access points when they are set.
- WS personnel are trained in identification of wolves and wolf sign.
- WS will maintain regular contact with appropriate state and federal agencies, reporting any sightings of wolves, wolf sign, or wolf depredations.
- WS will conduct a 24-hour trap check in occupied wolf range/habitat while using foot-hold traps (other than Victor#3 Soft catch, Victor 3N, or traps with an inside jaw spread less than a Victor 3N) or foot snares , as required by ODFW permit.
- Traps shall be equipped with a drag, even if solidly staked, and connections shall be welded or otherwise securely fastened. All traps pose a threat to juvenile wolves and, therefore, shall not be used in proximity to occupied dens and rendezvous sites from June 1 to October 1.
- WS will incorporate pan-tension devices in foot/leg snares and foot-hold traps to prevent the capture of smaller non-target animals. The amount of weight required to trigger the foot-hold trap for a wolf can be increased by the pan-tension device to exclude smaller animals.
- WS will maintain regular contact with the USFWS and ODFW to keep apprised of locations and information on the presence of any T&E animals including gray wolves, wolverines, and Canada lynx in Oregon.
- Non-target animals captured are released at site of capture unless the WS specialists determine that they will not survive.

- AVMA (2007) recommended euthanasia procedures are used when possible to minimize pain and suffering. Normally, this is a gunshot to the brain, but may include chemical immobilization/euthanasia procedures.
- Research continues to improve the selectivity and humaneness of management devices.
- WS has consulted with Native American Indian tribes in Oregon to consider any concerns that tribes may have regarding the proposal. Any wolf damage management conducted on sovereign tribal lands would be subject to additional consultations with both the tribe and ODFW.
- WS work on Native American Indian tribal lands would conform to tribal government plans for wolf damage management. WS work on tribal lands would also closely mirror protocol outlined in OWCMP in regards to lethal and non-lethal management of wolf depredation.
- WS records and monitors all wolf removal through its Management Information System (MIS). Close coordination with and reporting to ODFW would occur for each wolf to be removed. More detail is provided under Monitoring in this section.
- Motorized vehicle access on public lands will be limited to existing roads and/or public land travel policies
- Wolf damage management activities would be conducted only at the request of, and in coordination with the landowner or land management agency, and in the case of lethal control, per ODFW or sovereign tribal government decisions. Coordination provides for the communication necessary to avoid conflicts with land uses such as sensitive areas or public safety zones.
- The WS program is conducted under Cooperative Agreements and MOUs with federal and state agencies. National MOU's with the BLM (1995) and USFS (2010) delineate expectations for wildlife damage management on public lands administered by these agencies.

### Monitoring

Wildlife Services role in monitoring would be to provide wolf carcasses and/or data to ODFW from its wolf removals in Oregon. Additionally, WS provides information on wolf sightings, identification of wolf activity (tracks or scat), depredation investigations, telemetry searches, or any other monitoring activities. Wildlife Services monitors its program activities by using MIS which compiles data on take locations, damages, methods used, and other information. Information from MIS can then be provided to

cooperating agencies, used in wildlife management decisions and environmental analyses, and is available to the public.

## 2.4 Summary of Actions allowed by Alternative

Table 1 identifies and compares the major components allowed under each of the alternatives. Specific criteria or conditions for actions, as required by OWCMP (ODFW 2010a), are summarized under the detailed descriptions of each alternative.

<b>Table 1. Summary of WS activities that would be applied under each alternative</b> (Adapted from OWCMP (ODFW 2010a), Table III-1).				
<b>Activities</b> (Phases I and II and of wolf conservation and management)		<b>Alt. 1, No Action</b>	<b>Alt. 2, Non-lethal Only</b>	<b>Alt. 3, Proposed IWDM</b>
Investigate Wolf Depredation for ODFW and tribes		Yes	Yes	Yes
Non-lethal Technical Assistance (advice and information)		Yes	Yes	Yes
Non-lethal Direct Assistance including non-injurious or injurious harassment		No	Yes	Yes
Lethal Removal of wolves involved in chronic livestock depredation or threats to human safety.	Phase I <sup>6</sup>	No	No	Yes
	Phase II <sup>7</sup>	No	No	Yes
Non-lethal capture for relocation, collaring, research, and/or monitoring.		No	Yes	Yes

## 2.5 Alternatives Considered but Rejected from Detailed Analysis, with Rationale

### Integrated Wolf Damage Management Without a Threshold of Loss Requirement

This alternative would differ from the proposed action in that it would have removed the threshold of livestock loss imposed by OAR 635-110 (Appendix A) and OWCMP

<sup>6</sup> During Phase I, as defined in OWCMP (ODFW 2010), ODFW and CTUIR would implement lethal actions regardless of WS involvement (Appendix B). Landowners may also take a wolf under ODFW permit if caught “in the act” of attacking livestock. Individuals may kill a wolf that threatens a human. WS may investigate wolf depredations but with the exception of tribal lands, only ODFW may confirm such depredations.

<sup>7</sup> During Phase II, as defined in OWCMP (ODFW 2010), livestock producers may also lethally take wolves involved in chronic livestock depredation, by ODFW permit, in addition to any wolf caught “in the act” of attacking livestock, also by permit. Individuals may kill a wolf that threatens a human. ODFW and CTUIR would implement lethal actions regardless of WS involvement (Appendices A and B). WS may investigate wolf depredations but with the exception of tribal lands, only ODFW may confirm livestock depredations.

(ODFW 2010a) for agency removals of confirmed chronic depredating wolves. Under this alternative, WS would be able to remove wolves that simply threatened livestock or had killed fewer than the allowed threshold of loss. This alternative is not a viable alternative and cannot be selected based on the direction outlined in OAR 635-110 and OWCMP (ODFW 2010a). Wolves are not yet sufficiently abundant in Oregon to allow for more liberal removal actions and all actions must conform to the strategies allowed by the State. There is some flexibility in OWCMP (ODFW 2010a) that would allow producers to take wolves under permit which enhances agency actions. This alternative may interfere with ODFW's ability to achieve its wolf conservation and management goals.

#### Use of Birth Control Strategies to Reduce Wolf Depredation on Livestock.

Under this alternative, wolves would be sterilized or other contraceptive methods would be administered to limit the ability of wolves to produce offspring under the assumption that inability to reproduce would reduce wolf depredation on livestock. This strategy may interfere with ODFW goals for conservation and delisting of gray wolves. In USDA (2011a), WS considered wolf contraception strategies that involve removal of all wolves in a pack that had caused chronic livestock depredation with the exception of the breeding pair, which would be live-captured, surgically sterilized, radio-collared, and released under the assumption that the pair would maintain and defend its territory against other wolves. ODFW has not considered or included any wolf contraception strategies in the OWCMP (ODFW 2010a) nor does WS have the authority to implement or require ODFW to test or implement such strategies.

#### Eradication

An Eradication Alternative would direct all WS program efforts toward planned, total elimination of wolves. This Alternative will not be considered in detail because:

- Eradication of established wolf populations is contrary to state and federal efforts to protect and conserve wildlife and contrary to federal and state ESA requirements.
- Eradication of wolves is not acceptable to most members of the public.
- WS objective is to reduce damage, not to engage in large-scale eradication or suppression.

#### Agencies Exhaust All Non-lethal Methods Before Attempting Lethal Methods

Under this Alternative, all non-lethal methods would have to be attempted and proven ineffective prior to using lethal wolf damage management methods even though, in the professional judgment of WS or ODFW personnel, some methods that would have to be attempted would be impractical (*e.g.*, would incur costs in excess of value of resources protected), inappropriate (*e.g.*, use of a light siren device in areas near human residences) or likely to be ineffective for the particular situation (*e.g.*, situations where the predator appears to have habituated). This Alternative will not be addressed in detail for a number of reasons including: 1) time and resources of agencies and individuals experiencing

damage may be unnecessarily expended when non-lethal methods are unlikely to be effective, based on circumstances, experience and professional judgment; 2) the potential that additional losses could be incurred while experimenting with non-lethal methods; and 3) experimenting with non-lethal approaches may not be appropriate in the rare instance of a wolf-related threat to human safety.

#### Lethal Only Program

Under this Alternative WS would only provide technical and operational assistance with lethal damage management techniques. Prohibiting WS from using or providing technical assistance on effective and practical non-lethal wolf damage management methods is not in the best interest of the continued recovery of the species, is contrary to agency policy and directives (WS Directive 2.101), and will not be analyzed further. In certain situations, non-lethal methods may provide short-term or long-term solution to wolf damage problems.

#### Sport Hunting and Trapping to Resolve Damages

In Phases I and II (ODFW 2010a), ODFW has determined that sport hunting with firearms and trapping will not be allowed for gray wolves in Oregon. However, the OWMCP (2010) states that controlled take of wolves may be authorized during OWCMP Phase III with special permits. WS cannot authorize regulated take and could not select an alternative that relied on sport harvest.

#### Live capture and relocation of depredating wolves.

When individual wolves or wolf packs are already established as chronic depredators of livestock, moving them to another location would pose a high risk that the wolves would simply further cause more livestock predation losses in their new area. Wolves can and often do move long distances in relatively short periods of time and cannot be expected to stay in areas to which they are relocated. Thus, even if wolves could be relocated to remote wilderness or sparsely inhabited areas away from livestock, they cannot be relied upon to stay in such areas and avoid further livestock depredation problems. The OWCMP (ODFW 2010a) specifies that depredating wolves or wolves suspected of depredation will not be relocated. Because WS has no authority to require ODFW to choose this alternative, we will not consider this alternative further.

---

## CHAPTER 3 - ISSUES IMPORTANT TO THE ANALYSIS OF IMPACTS

### 3.1 Issues Driving the Analysis

The following environmental issues or resources, have been evaluated in this EA to help determine the impacts of the proposed action on the environment, and to compare the alternatives in Chapter 4.

- **Impacts on wolf populations** - What might be the impact of removing wolves on the growing Oregon wolf population, locally, in eastern Oregon, and statewide? What would be the cumulative effects of the proposal?
- **Impacts on non-target animals and human safety** - Would there be potential impacts on other species besides wolves? Could the program affect pets or wildlife? Might the program have adverse or beneficial effects on federally protected species? Are there any concerns for human safety?
- **Social and Aesthetic Perspectives** – How acceptable are the alternatives to stakeholders? How is humaneness perceived? What are the implications for the aesthetic value of wolves?
- **Effectiveness** – A discussion on the effectiveness of the alternatives will reveal how well the alternative meets the purpose and need for action. This issue is not an environmental issue, but it is an important management consideration that will be weighed with the environmental findings to make an informed decision.

### 3.2 Issues Not Analyzed in Detail, with Rationale

#### Effects of wolf removal on a pack's social structure

Pack resilience to mortality is inherent in wolf behavioral adaptation and reproductive capabilities (Brainerd et al. 2008). Wolf populations have sustained human-caused mortality rates of 30 to 50% without experiencing declines in abundance (Keith 1983, Fuller et al. 2003). In addition, Brainerd et al. (2008) found that 62% of packs in recovering populations retained territories despite breeder loss, and of those who lost territories, one-half became re-established. Furthermore, pup survival was primarily dependent on size of pack and age of pup because multiple pack members feed pups despite loss of a breeder. Pup survival in 84% of packs with breeder loss was similar or higher than packs without breeder loss (Mech and Boitani 2003).

#### Ecological effects of wolf removals

Wolf damage management, combined with other forms of mortality, would not be likely to result in a net decrease in wolves; rather, it is expected to support eventual

conservation and wolf management as discussed in OWCMP (ODFW 2010a). Based on a review of available literature in USDA (2011a), and Mech (2012), we find no reason to expect that wolf removals would result in significant adverse effects on the quality of the human environment because of possible wolf-related changes in ecosystems.

Appropriateness of preparing an EA (rather than an EIS) for such a large area, rather than preparing multiple EAs for smaller, more site-specific areas

Federal agencies have the discretion to determine the geographic scope of their NEPA analyses [*Kleppe v. Sierra Club*, 427 U.S. 390, 414 (1976)] and WS has determined that preparation of this EA to address wolf damage management in Oregon is appropriate and consistent with wolf management objectives and plans (ODFW 2010a, OAR 635-110). If in fact a determination is made through this EA that the proposed action would have a significant impact on the quality of the human environment, then an EIS may be prepared in compliance with NEPA.

Producers should consider that wolf predation losses are a cost of doing business

Livestock producers recognize that some level of predation losses are likely to occur, in spite of their own and agency efforts to reduce the amount of losses. The OWCMP (ODFW 2010a) is not setting expectations of preventing all losses, nor does it prescribe lethal wolf damage management as a solution to all depredation incidents. OWCMP (ODFW 2010a) and AOR 635-110 established an integrated approach to resolve wolf damage complaints. In some situations the use of non-lethal methods alone may be adequate for resolving wolf depredation complaints, but often there will be situations which require lethal measures. Most instances of wolf predation on sheep, for example, occur in spite of sheep producers' use of herders and livestock guarding dogs to help protect the sheep from predation. Livestock producers incur not only direct losses but also indirect losses including: harassment of livestock by wolves; fence repairs after wolves chase livestock through fences; costs to gather and regroup livestock dispersed by wolves; and extra costs when producers have to pay for feed because livestock are removed from grazing pastures to minimize risks from wolves. These and other indirect effects that wolves have on livestock are discussed under Section 1.2.1.

Native American Indian Lands

Tribal wildlife managers with responsibilities to protect and manage treaty-reserved wildlife resources in Oregon may meet wolf management needs in their areas of interest and influence. Tribal staff trained in wolf identification and handling will take the lead on addressing on-reservation wolf management needs (OWCMP 2010a, Ch. 10).

WS has contacted the Confederated Tribes of the Umatilla Indian Reservation, Burns Paiute Tribe, Confederated Tribes of the Warm Springs Reservation, and the Klamath Tribes to determine if issues of concern to Native American Indians have been adequately addressed in this EA. Because extensive outreach occurred during the

preparation of the OWCMP (ODFW 2010a), no new issues have arisen from the outreach and consultation associated with this EA.

As discussed under the proposed action, WS work on tribal lands would conform to similar depredation management protocols as allowed under the OWCMP (ODFW 2010a) and OAR 635-110. Therefore, work on tribal lands in Oregon would not add new issues or change the analysis of effects considered in detail.

#### Effects on Wilderness, Wilderness Study Areas, National Parks, State Parks and National Monuments

Wolf removals would not occur in National Parks, and National Monuments. Because individual wolves may be removed from surrounding areas, the potential for a slight temporary effect on users of National Parks, and National Monuments may occur by reducing the opportunity to view or hear a wolf that may have otherwise traveled into the protected area, however the effect would be insignificant because wolf populations would be expected to continue to grow for the reasons discussed in OWCMP (ODFW 2010a), and in Chapter 4.

Wolf removal may occur in federally designated wilderness areas or Wilderness Study Areas (WSA). The Wilderness Act (16 U.S.C. §§ 1131-1136) established a national preservation system to protect areas “*where the earth and its community life are untrammelled by man*” for the United States. Wilderness areas are devoted to the public for recreational, scenic, scientific, educational, conservation, and historical use. This includes the grazing of livestock where it was established prior to the enactment of the law (Sept. 3, 1964). The Wilderness Act did leave management authority for fish and wildlife with the States for those species under their jurisdiction. Some portions of wilderness areas in Oregon have historic grazing allotments and WS may conduct limited wolf removal for protecting livestock or human safety as directed by ODFW in accordance with the OWCMP. In accordance with Forest Service Manual 2323.33, the Regional Forester may approve predator damage management on a case-by-case basis to protect livestock and human health and safety in designated wilderness. The Regional Forester will only approve the action when removing the offending animal would not diminish wilderness value.

WS conforms to Revisions and Clarifications to H-8550-1, Interim Management Policy for Lands Under Wilderness Review (March 19, 2004 memorandum (No. 2004-140) from BLM Director to all Washington and Field Office Officials). WS follows BLM's Interim Management Policy for Lands Under Wilderness Review, H-8550-1 (1995), and the MOU between BLM and WS.

WS proposed activities on lands under wilderness review (WSAs) do not conflict with BLM management objectives as set forth in the RMPs. In WSAs, WS work is limited to actions allowed in BLM's Interim Management Policy for Lands Under Wilderness Review (H-8550-1, III. G. 5., July 5, 1995), as revised (BLM 2004). These documents

provide, in part, that wildlife damage management may be permitted in certain circumstances in order to protect domestic livestock and reduce human health or safety risks. Coordination is required in order that wildlife damage management activities planned in WSAs meet the non-impairment criteria. Proposed WS AWP are presented for review by BLM during the work planning process to ensure that areas of conflict do not exist. Therefore, WS actions should have no effect on wilderness characteristics such as size, naturalness, solitude, aesthetics, primitive or unconfined type of recreation, supplemental values, and the possibility of returning the area to a natural condition as stated in BLM's Wilderness Inventory Handbook from 1978 and the Interim Management Policy for Lands under Wilderness Review. (H-8550-1, July 5, 1995)

Similarly, WS follows policies outlined in the USFS Manual, particularly Section 2323, and the national MOU between USFS and WS when conducting PDM in WAs. Proposed WS work plans are reviewed by USFS during the work planning process to ensure that areas of conflict do not exist. Therefore, WS wolf damage management would have almost no effect on wilderness characteristics or management objectives. It would not impair the wilderness designation by Congress.

For the reasons discussed above, it is highly unlikely that WS proposed wolf damage management activities would impact Wilderness or WSAs.

#### **Additional issues not considered because they are outside the scope of this analysis**

##### Issuance of permits to landowners to take wolves

Wolves are currently managed by the ODFW (OWCMP 2010a) and the issuance of permits to landowners and livestock producers by ODFW is a decision of ODFW and outside the scope of any decision that WS would make as a result of this EA. Actions by others to address wolf conflicts have been considered under the cumulative impacts discussions in Chapter 4.

##### Desire for or opposition to a hunting season for wolves

WS has no authority to authorize or deny hunting or trapping season for wolves, and this issue is outside the scope of any decision that WS could make in conjunction with this EA. OAR 635-110-0030 (7) does state that the Commission will authorize controlled take of wolves by special permit when meeting required circumstances.

##### Appropriateness of livestock grazing on public lands

Regulating or authorizing livestock grazing on public lands is the responsibility of the respective public land management agencies.

##### Appropriate population level for wolves in Oregon

USFWS supports the OWCMP (USFWS et al. 2011). The OFWC, has, through its approval of the 2010 OWCMP concurred with ODFW's proposed population level for wolves in Oregon. This issue is outside the scope of any decision that WS could make as a result of this EA.

#### Other resources

The actions discussed in this EA do not involve ground disturbance, construction or alteration of vegetation. Therefore, the following resource values are not expected to be significantly affected by the alternatives analyzed: soils, geology, minerals, water quality/quantity, flood plains, wetlands, visual resources, air quality, prime and unique farmlands, aquatic resources, vegetation, cultural resources or special management areas. There are no significant irreversible or irretrievable commitments of resources other than a minor use of fossil fuels to operate vehicles. These resources will not be analyzed further.

### **3.3 Evaluation Methodology**

Each issue will be evaluated under each alternative and the direct, indirect and cumulative effects will be disclosed as applicable. NEPA describes the elements that determine whether or not an impact is "significant". Significance is dependent upon the context and intensity of the impact. The following factors will be used to evaluate the significance of the impacts in this EA that relate to context and intensity (adapted from USDA (1997, revised) for this proposal):

Magnitude of the Impact (size, number, or relative amount of impact) (intensity) – Quantitative analysis is used where possible as it is more rigorous and is based on all known sources of wolf mortality and actions provided for under the OWCMP (ODFW 2010a) as updated since its publication. Magnitude may be determined either quantitatively or qualitatively;

Duration and Frequency of the Impact (temporary, seasonal impact, year round or ongoing) (intensity);

Likelihood of the Impact (intensity);

Geographic Extent (limited to the local unit area, to the management zone, the State of Oregon, or beyond) (context); and

Legal Status of the species that may be affected; and conformance with regulations and policies that protect the resource in question (context).

The analysis in Chapter 4 uses the OWCMP (ODFW 2010a and OAR 635-110 (Appendix A) as the environmental baseline under which wolves are managed. Confirmed wolf numbers are used to estimate the current wolf population. Using

confirmed numbers likely underestimates the total number of gray wolves in Oregon but is the best information available. The analysis on Oregon's wolf population will identify localized effects as well as overall current and cumulative effects on the population. The cumulative effect on the gray wolf population in Oregon includes past, present and reasonably foreseeable future actions of WS and others.

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

### CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

Chapter 4 provides information needed for making informed decisions on the wolf damage management objectives identified in Chapter 1. This chapter uses the issues identified in Chapter 3 as the evaluation criteria. Each of the issues will be analyzed for its environmental consequences under each alternative.

Direct, indirect, and cumulative impacts are discussed in relationship to effects on the wolf population and any anticipated non-target impacts, perspectives of human social values and aesthetics. The effectiveness of the alternatives is also discussed as a measure for comparison in meeting the purpose and need for action.

#### **4.1 Alternative 1 – No Action**

The No Action Alternative means that WS would not take additional action to assist ODFW or tribes with wolf damage management to protect livestock or human safety in Oregon. Under the current program, or no action alternative, WS would continue to provide ODFW, tribes, or other agencies with information related to wolf damage identification, and provide non-lethal technical assistance to landowners. ODFW would implement measures in the OWCMP (ODFW 2010a and OAR 635-110 (Appendix A), and in the absence of additional WS assistance, would target wolves for lethal control as described in Chapter 3. CTUIR or other tribes with management authority of wolves will implement measures according to their wildlife policies. Thus, the cumulative effects of such actions are the current environment under which wolves exist, and are discussed as the environmental baseline, or the environmental status quo.

##### **4.1.1 Impact on wolf population**

###### Gray Wolf Populations in Oregon

As of December 2011, there were four known wolf packs confirmed in eastern Oregon with 29 confirmed individuals (ODFW 2012b). Continued wolf movement into Oregon from adjacent states is likely given the current population of wolves in the state of Idaho which has 101 documented wolf packs and an estimated population of 746 wolves, with additional packs overlapping along bordering states (IDFG and Nez Perce Tribe 2012). The wolf population in Oregon is expected to grow as Oregon wolves continue to reproduce and as wolves from other states enter Oregon through natural dispersal. The Idaho portion of the NRM DPS is expected to continue to supply new dispersing wolves to Oregon, which will diversify the gene pool and fill in home ranges that become vacant due to lethal control, natural mortality, unintended mortalities or westward

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

dispersal. It could take 1 to 2 decades for eastern and western Oregon to reach management population objectives (ODFW 2010a).

Wolves could possibly occupy portions of the high desert region of southeastern Oregon if human tolerance is sufficient and prey is adequate. However, the rate of wolf dispersal into and throughout Oregon cannot be predicted. The ability of wolves to reach areas of habitat outside northeast Oregon is assumed. There has been documented wolf activity as far west as the Cascade Mountains as was evidenced by dispersers OR-7 and OR-3 from the Imnaha pack, but resident wolves or packs have not yet been confirmed (ODFW 2012b).

As wolf activity is documented through discovery of individual wolves or wolf pack activity, ODFW will continue to radio-collar and monitor individuals. By monitoring and observing wolves regularly, determinations regarding the habitats they select and occupy will be possible. Management decisions will be evaluated for reducing conflicts while promoting recovery (ODFW 2010a).

Wolves can occupy a variety of habitats provided adequate prey is available and they are tolerated by humans (ODFW 2010a). Without conflicts with humans, much of Oregon could support wolves (ODFW 2010a). The specific habitat chosen will be determined by prey availability and human tolerance and probably will include forests and rangeland habitats (ODFW 2010a). Habitat such as wilderness areas or other areas away from livestock use offers the best chance for successful recovery provided prey is sufficient. Habitats in northeastern Oregon with few potential human conflicts include Eagle Cap, Wenaha-Tucannon, North Fork John Day and Strawberry Mountain wilderness areas, Hells Canyon National Recreation Area, designated roadless areas on public lands, and areas characterized by low density of open roads (ODFW 2010a, Figure 3: Forested, Roadless and Wilderness Areas in Oregon). Such areas would be characterized as highly suitable because human densities and activity levels are low and ungulate numbers are considered adequate to support wolves (ODFW 2010a). Wolf presence in these areas will be supported through ODFW management actions (ODFW 2010a).

### Direct effect on gray wolf populations

WS would have no effect on individual wolves, or upon wolf conservation and management in Oregon under the No Action alternative, other than as a provider of non-lethal technical assistance and information to ODFW and landowners.

### Cumulative effects on gray wolves in Oregon

#### **Causes of wolf mortality**

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

Wolves die from a variety of causes, whether natural or human-caused. Naturally caused mortalities result from territorial conflicts between packs, injuries while hunting prey, old age, disease, starvation or accidents. In an established Alaskan wolf population largely protected from human-caused mortality, most wolves were killed by other wolves, usually from neighboring packs (Mech et al. 1998). Pletscher et al. (1997) studied survival and mortality patterns of wolves in the Glacier National Park area. Total annual survival for this semi-protected population was a relatively high 80%. The survival rate for resident wolves was even higher (84%), but dispersers had a 64% chance for survival. Despite the high survival rates, humans accounted for the vast majority of wolf deaths. Of the 43 deaths investigated from 1982 to 1995, 88% were human-caused (56% legal, 32% illegal). Three wolves died of natural causes and two died of unknown causes.

USFWS stated that natural mortality probably does not regulate the NRM populations. Human caused wolf mortality, including depredation control, legal and illegal killings, and vehicle accidents, is the only cause that can significantly affect populations at recovery levels (65 FR 43449; July 13, 2000).

Current human-caused mortality data in the NRM DPS are available from the USFWS et al. (2012). In 2011, all known human-caused mortality within the NRM DPS was approximately 23% of the absolute minimum estimated population. Human caused mortality included agency control, legal harvest, and other. Legal harvest was instituted in Montana and Idaho after gray wolves were removed from federal protection. Legal harvest in these two states accounted for approximately 14% of the absolute minimum NRM DPS estimated wolf population. Agency control, which included legal take in defense of property by private citizens, accounted for approximately 7% of the absolute minimum NRM DPS estimated wolf population in 2011. Included in this estimate were Oregon's wolf removals at 6% of its 2011 population.

The ODFW is aware that illegal wolf killing occurs (OWCMP 2010a). The ODFW and WS realize that a small portion of the human population will likely kill wolves no matter what wolf damage management program is in place. However, the agencies also believe that prompt, professional, effective resolution of conflicts with wolves will help maintain public tolerance of wolves and allow for maintenance of a recovered population. Additionally, management directed removals will prevent an increase in untrained individuals attempting lethal wolf management on their own, and should reduce the likelihood of an increase in anti-wolf behaviors by intolerant stakeholders (Niemeyer et al. 1994, USFWS 1994). Illegal killing generally occurs when people feel they have no legal access to resolution of their problems.

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

Social studies by Kellert (1999), Schanning et al. (2003), Naughton-Treves et al. (2003), and Naughton et al. (2005) in the Great Lakes area show strong public support for lethal control of problem wolves by government agents. Illegal killings by private individuals are less likely to be specific, and could potentially have more adverse impacts on the wolf population than focused lethal actions by trained agency professionals. Illegal killing by untrained individuals is also less likely to be effective in reducing depredation events, as it would be less likely to target the specific depredating animals.

The Wildlife Society, an international organization of professional wildlife biologists, states that “Control of wolves preying on livestock and pets is imperative and should be prompt and efficient if illegal killing is to be prevented and human tolerance of the presence of wolves is to be maintained (Peek et al. 1991, 73 FR 10514, 74 FR 15123). The International Union for Conservation of Nature (IUCN) has established a “Manifesto on Wolf Conservation.” The “Manifesto” was published in International Wolf Magazine in 1994 (IUCN 1994). The 7th Principle for wolf conservation stated, “It is recognized that occasionally there may be a scientific established need to reduce non-endangered wolf populations; further it may become scientifically established that in certain endangered wolf populations specific individuals must be removed by appropriate conservation authority for the benefit of the wolf population.” In an extensive literature review of strategies for reducing carnivore/livestock conflict by Norwegian biologists, it was concluded that lethal control should be considered on endangered carnivores such as wolves to prevent expansion into areas of high conflict (Linnell et al. 1996).

Since 1999, confirmed gray wolf mortality in Oregon has included legal, illegal and accidental deaths and has numbered nine individuals, while the population has increased from none to more than 29 individuals with one breeding pair documented in 2011 (ODFW 2012b). ODFW believes that there are likely to be more wolves in the state dispersing into new areas, including the Cascade Range.

Known gray wolf removals and mortality in Oregon since 1999:

- 1999 – non-lethal capture and return of collared female wolf to Idaho
- 2000 – illegal shooting of a male wolf in Umatilla County.
- 2000 – male wolf killed in vehicle collision
- 2007 – female wolf illegally killed in Union County
- 2009 – WS lethally removed a nonbreeding male and female wolf in Baker County after chronic confirmed livestock depredation and failed attempts at stopping the damage with non-lethal method. The removal order was issued by ODFW.
- 2010 - male radio-collared wolf illegally killed
- 2011 –a female wolf died of undetermined causes – ODFW lethally removed a male and female non-breeding wolf from the Imnaha pack on

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

private land<sup>8</sup>. The wolves were taken in response to repeated livestock losses caused by the pack, and after non-lethal methods failed to stop the damages.

- 2012 – wolf found dead (as of May 2, 2012, ongoing investigation)

Based on the level of known mortality to date, Oregon’s wolf population has continued to expand despite accidental, illegal, and legal forms of human –caused mortality. Actual mortality rates and population numbers may be higher or lower; population numbers reported by ODFW only count confirmed individuals and likewise, mortality figures only cover known mortality events. Only a portion of the known or confirmed wolves in Oregon are equipped with radio / tracking collars. New confirmed or reliable sightings indicate additional wolf activity in Oregon.

The OAR 635-110 (Appendix A) and OWCMP (ODFW 2010a) also allows ODFW to issue permits to landowners in certain situations. In 2011, ODFW issued 32 “caught in the act” permits to livestock producers that have requested one. For information on permit conditions, see OAR 635-110. No wolves were taken under permit by private landowner as of the date of this EA. Few wolves are expected to be killed under private permit due to the need to witness the wolf in the act of attacking or killing livestock which usually occurs at night. If combined mortality (landowners or agency) results in the targeted wolf kills, ODFW may revoke all permits to see if the depredation stops, before taking any further action.

The potential for WS to incidentally take a state listed wolf while performing either wolf damage management or non-wolf related damage management work has been evaluated. ODFW has concurred with WS’s determination that it is not likely to take a wolf in areas where wolves were not known to occur. In occupied wolf range in Oregon, as defined in the 1994 Northern Rocky Mountain Wolf Recovery EIS, incidental capture of a wolf is possible. However, WS implements precautionary measures to minimize incidental captures of wolves. ODFW has issued WS an incidental take permit outlining conditions to minimize the risk (permit number WD-ITP-12-01) and determined that WS is not likely to adversely impact the long-term conservation of the species in Oregon.

The potential for WS activities to incidentally affect wolves in those areas outside the NRM DPS in Oregon (west of Highway 395, 78 and 95) which are protected by the federal ESA, require consultation with the USFWS, pursuant to the federal ESA.

---

<sup>8</sup> On May 10, 2011, ODFW issued the announcement it would lethally remove two wolves, which they did on May 16 and May 18, 2011.

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

ODFW may also order controlled take of wolves after a state delisting when and if wolves have been determined to be the primary cause of ungulate population or recruitment decline locally or in a wildlife management unit. No actions are proposed at this time. The OAR 635-110 and OWCMP (ODFW 2010a) calls for translocation, relocation or controlled take to reduce wolf numbers to meet ungulate management objectives when wolves are no longer state ESA protected.

The OWCMP (ODFW 2010a) reviewed the current literature regarding wolf – human interactions. Although there are populations of wolves in Europe, Russia, and North America, there are few occasions of wolf attacks on people. The Oregon ESA does not address provisions for taking an endangered species for the protection of human safety but Oregon’s criminal code may provide some defense for someone acting under the threat of grave injury or imminent threat (ORS 161.200). There may be the potential for wolves to be removed for human health and safety concerns; however this human caused mortality is unlikely.

### **Gray wolf recovery, conservation and management**

The Northern Rocky Mountain Wolf Recovery Plan (USFWS 1987) required recovery goals for the northern Rocky Mountain gray wolf population only from Idaho, Montana, and Wyoming. Thus, a population of wolves in Oregon was not necessary to be able to recover wolves and remove the NRM DPS from the federal ESA threatened/endangered list. USFWS et al. (2012) stated: “By every biological measure the NRM DPS wolf population is fully recovered.”

The State of Oregon’s ESA protects gray wolves throughout Oregon but they are only federally protected in Oregon outside of the NRM DPS. As defined in Chapter 1, the NRM DPS in Oregon is defined by that portion of Oregon east of Highway 395 and Highway 78 north of Burns Junction and that portion of Oregon east of Highway 95 south of Burns Junction (74 FR 15123; April 2, 2009). This boundary falls within ODFW’s east wolf management zone (Figure 2).

OAR 635-110 (Appendix A) and OWCMP (ODFW 2010a) discuss three phases for conservation and management of gray wolves in Oregon and applies only to wolves that are not federally listed. The conservation and management phases are summarized in Section 1.4, ODFW Wolf Management Goals and Objectives. More detailed information is contained in OAR 635-110 which is included as Appendix A.

### **Effects of OWCMP (ODFW 2010a) and OAR 635-110 on wolf populations**

One of the main challenges for wolf planners in Oregon has been estimating the number and distribution of wolves sufficient to achieve conservation of wolves in Oregon and satisfy state delisting criteria, while protecting the social and economic interests of all Oregonians. Setting population goals too high could

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

foster unrealistic expectations and result in social and biological conflict, and uncertainty regarding the capacity of Oregon to support wolves. Drafters of the OWCMP (ODFW 2010a) relied on information from other state wolf management plans and the scientific literature to develop wolf population objectives.

Uncertainties surrounding the eventual location of dispersing wolves were considered during development of the OWCMP (ODFW 2010a). One concern was that considerable time could pass before wolves would naturally disperse to western Oregon. In the meantime, wolves would be located primarily in eastern Oregon where human tolerance could be affected as the wolf population increased. The decision to divide the state into two State management regions (eastern and western Oregon) (Figure 2) with separate but equal population objectives provides the flexibility needed to manage increasing wolf numbers in eastern Oregon while encouraging conservation in western Oregon. The statewide process to consider delisting could be initiated when four breeding pairs of wolves are present for three consecutive years in eastern Oregon. This approach ensures connectivity to the large meta-population of wolves in Idaho, an important factor in achieving conservation of wolves in Oregon.

Based on studies from several researchers, there appears to be enough habitat connectivity between occupied wolf populations in Canada, northwestern Montana, Greater Yellowstone Area, and Idaho to ensure exchange of sufficient numbers of dispersing wolves to maintain demographic and genetic diversity in the wolf population (Oakleaf et al. 2006, Carroll et al. 2006, vonHoldt et al. 2008, vonHoldt et al. 2010). Because suitable habitat is nearly saturated in the original wolf reintroduction area of greater YNP/Montana, Wyoming, and Idaho, core refugia within these populations will continue to produce a large number of 'surplus' wolves which will either fill in social vacancies within the core refugia, die, or disperse out of the core refugia. Pack resilience to high mortality is inherent in behavioral adaptation and high reproductive capabilities of wolves. Brainerd et al. (2008) found that 62% of packs in recovering populations retained territories despite breeder loss, and of those who lost territories, one-half became reestablished. Brainerd et al. (2008) also found that, following the removal of wolves for livestock depredation in the NRM wolf population, the breeding status of packs was not greatly affected, regardless of the breeding status of individuals or proportion of a pack removed. Population size, proximity of other wolf packs, and the number of dispersing wolves' influence the frequency with which alpha males and females will be replaced (Brainerd et al. 2008). Social vacancies, whether from loss of breeders or non-breeders, are likely to be quickly filled by dispersing wolves or other wolves within the pack.

Because of the proximity of northeastern Oregon to Idaho packs, dispersing wolves initially occupied areas in northeastern Oregon (ODFW 2010a, Figure 4:

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

Wilderness and Roadless Land in Eastern Oregon and central Idaho). Wolf breeding pairs in these areas could be considered more secure and stable because of their proximity and connectivity to the Idaho population of wolves. However, other competing factors such as declining ungulate populations, competing carnivore populations and livestock production in those areas will need to be considered. Wolf movement and dispersal between the two populations would allow gene flow between the populations.

Another important factor in maintaining wolf populations is the native ungulate population. 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 in eastern Oregon. 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 (OWCMP 2010a).

As explained by Edward Bangs, USFWS, secure habitat for gray wolves is limited in Oregon; therefore biologists predict that fewer wolves will occupy Oregon than are found in similar but much more abundant habitat in Idaho. The federal recovery goal for the Idaho wolf population was 10 breeding pairs in what has been described as the best remaining wolf habitat in the lower 48 states. Oregon, on the other hand, was not selected as a recovery state primarily due to lack of large blocks of contiguous public land habitat (as cited in ODFW 2010a). Research published in 2003 suggested that the smallest viable wolf populations might be two to three adjacent packs with four wolves each, located 40-60 kilometers (km) apart (Fuller et al. 2003). Each pack might cover 117 square km if the ungulate density averaged eight deer per square km. The authors also wrote that such small populations could persist anywhere if the prey density was at average population levels and productivity, and where wolf production exceeded mortality.

Several notable examples of small wolf populations can be found in the scientific literature. The Isle Royale wolf population began from a single pair of wolves in about 1949. The population has fluctuated between 12-90 individuals (David Mech, personal communication *in* ODFW 2010a). This population has apparently lost 50% of its original genetic diversity (Wayne et al. 1991), yet it has persisted for more than 60 years despite being isolated on an island. Remnant wolf populations in Europe (*i.e.*, Italy, Spain and Portugal) numbering fewer than 100-200 wolves persisted for decades and have since expanded their numbers and range, and avoided extinction (USFWS 1994).

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

When the USFWS identified and delisted the NRM DPS, except for Wyoming<sup>9</sup>, its 2008 estimate indicated the NRM DPS contained approximately 1,639 wolves (491 in Montana; 846 in Idaho; 302 in Wyoming) in 95 breeding pairs (34 in Montana; 39 in Idaho; 22 in Wyoming) (74 FR 15123 April 2, 2009). Those numbers were about 5 times higher than the minimum population recovery goal and 3 times higher than the minimum breeding pair recovery goal, and marked the ninth consecutive year the population had exceeded USFWS distribution and recovery goals. Since then and with states implementing management plans, the 2011 NRM DPS wolf population contained  $\geq 1,774$  wolves in  $\geq 287$  packs with  $\geq 109$  breeding pairs. Montana and Idaho have (Wyoming is underway) adopted State laws, management plans, and regulations that met the requirements of the federal ESA to conserve the recovered wolf population into the foreseeable future. Oregon's yet to be established wolf populations were not necessary for NRM DPS recovery.

Wolf populations are dynamic and can undergo major fluctuations. Many studies have examined various levels of mortality and harvest of wolves in relation to the impacts these mortality levels have on gray wolf populations. Wolf populations have sustained human-caused annual mortality rates of 30 to 50% without experiencing declines in abundance (Keith 1983, Fuller et al. 2003). Mortality rates in unexploited wolf populations average 45% for yearlings and 10% for adults. Since 1995, 53% of documented wolf mortalities in the GYA have been human-caused (Smith and Guernsey 2002). Wolves' productivity, in terms of recruitment and immigration, is what allows them to persist under human harvest (Fuller et al. 2003). In areas where human-caused mortality is low, disease, starvation, and killing by other wolves are the primary causes of wolf mortality.

Wolf populations and packs within the NRM wolf population are resilient to regulated mortality because adequate food supplies are available and core refugia provide a constant source of dispersers to replenish breeding vacancies in packs. USFWS et al. (2012) reported that the minimum estimated NRM DPS wolf population in 2011 increased slightly (~3%) from 2010 levels, with pack and breeding pair estimates being similar to the previous year. Data from 2011 suggested that the growth rate of the NRM wolf population declined and the population may be starting to stabilize (USFWS et al. 2012).

Wolf populations in the NRM are characterized by robust size, high productivity, closely neighboring packs, and many dispersers (USFWS et al. 2007). The OWCMP allows ODFW and landowners to remove a minimal number of wolves in Oregon to protect livestock and human safety while promoting recovery.

---

<sup>9</sup> Wyoming was excluded from the delisting not because it lacked sufficient wolves, but because it lacked adequate protection plans. Wolves in Wyoming will continue to be regulated by USFWS as a non-essential, experimental population.

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

Removal of wolves in Oregon from the NRM DPS zone would not have an impact on the overall NRM DPS population. The Oregon wolf population has grown including dispersing individuals from neighboring states, it is anticipated that wolves would continue to expand in number and range in Oregon.

ODFW has made it clear that without the assistance of WS, it would implement lethal control actions which would require that it divert resources from other wolf management actions that are necessary to ensure wolf recovery in Oregon (Appendix B). ODFW's recovery resources that may be reduced under the No Action alternative would include non-lethal control supplies; capture, monitoring and research needed to assess population viability and health; and wolf damage management on livestock. ODFW has stated (Appendix B) "that the reduction in these other programs will have a direct impact on actions necessary to ensure recovery of wolves in Oregon". CTUIR has indicated that it too would manage wolf damage without WS (Appendix B). Total agency wolf removal is expected to occur at a low frequency relative to the population because wolves that are not involved in chronic depredation (as defined in OAR 6350110 and ODFW 2012a), would not be targeted for removal.

### **Compensation and Financial Assistance**

The compensation and financial assistance program is not expected to notably affect agency wolf removals. Compensation can increase public tolerance but it does not stop depredation. Producers may also be reimbursed for a portion of their expenditures on non-lethal methods and wolf deterring management. It would be speculative to conclude that reimbursement assistance for materials or methods would cause producers to use more or other measures that would be more likely to stop damages. Presumably, producers are now doing everything reasonable to prevent damages and avoid losses. The potential beneficial effect of this option would be to enhance public acceptability of wolves, particularly for those that are bearing the burden of the negative effects of wolves on their livestock and livelihoods. Effects of financial compensation on program effectiveness and public tolerance of wolves is discussed in Sections 4.1.4 and 4.1.3, respectively. To the extent that public acceptance is enhanced, there is the potential illegal killing of wolves may be reduced. Thus increasing public tolerance of wolf conflicts and reducing unauthorized take can lead to an enhanced ability for ODFW to meet conservation and management goals.

### **Conclusion**

Oregon's wolf conservation and management strategies include a cautious and conservative approach to managing wolf depredation. This approach, combined with the abundant source population in Idaho and along with sufficient suitable

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

habitat and prey availability in Oregon, indicates that it is reasonable to conclude that wolves will continue to expand in range and in number within the foreseeable future to levels that meet delisting criteria in Oregon's eastern management zone. Even prior to the federal delisting of the NRM DPS in a portion of Oregon's eastern management zone, the USFWS noted that wolves in eastern Oregon were not necessary to meet recovery goals of gray wolves in the NRM DPS. The recovery goals established in 1987 called for 10 breeding pairs and 100 wolves from each of the three recovery areas in Montana, Idaho, and Wyoming. At the time of this writing, any wolves in Oregon that migrate outside of the NRM DPS would be federally protected under the ESA. If wolves outside of the NRM DPS in Oregon were to be delisted by the USFWS, they would be managed by ODFW as a state listed species under the Oregon ESA. Wolves managed under state ESA will remain under conservation status until the delisting criteria is met, and then managed according to the State's plans for its east and west management zones. The OWCMP (ODFW 2010a) indicated that ensuring at least four breeding pairs each in eastern and western Oregon would provide for the long term maintenance of a viable wolf population in Oregon. Based on confirmed sightings in the Cascade region, it is likely that wolf packs will become established in western Oregon in the foreseeable future.

Removing wolves that are involved in chronic depredation is necessary to help achieve conservation and management goals. Wolves that rely on their natural prey, not livestock, are expected to continue to expand their populations according to OWCMP (ODFW 2010a) stated goals and objectives: Based on the expanding wolf population in Oregon and the ability of wolves to tolerate removal levels well above those that would be expected in Oregon, the cumulative effect on the wolf population is not expected to hinder OWCMP (ODFW 2010a) recovery goals, and would be likely to benefit wolves in the long term by facilitating public tolerance and ODFW conservation and management goals. ODFW has clearly stated that it would target problem wolves for lethal control per OWCMP (ODFW 2010a) and OAR 635-110, however this would require reducing other wolf management actions needed for recovery if WS were to select this alternative and be unable to offer additional assistance to manage confirmed livestock depredation.

### **4.1.2 Impacts on non-target animals and human safety**

#### Non-target animals

WS would have no effect on non-target animals or human safety under the No Action alternative.

Wolf removal actions by ODFW are expected to occur at a low frequency and in very limited and isolated geographic locations. ODFW has demonstrated their

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

professionalism, expertise, and their skill in capturing wolves and other target species. Given ODFW's skill and the selectivity of the methods to be used, non-target animals, including threatened and endangered species will not likely be affected or the risk is very low. The potentially harmful non-lethal or lethal methods available to WS (aerial shooting, foot and neck snares and foot-hold traps) are also available to ODFW. Aerial and ground shooting is virtually 100% selective for target species because the target animal or animals are observed and verified as target species by trained and experienced personnel prior to shooting

Traps and snares may potentially capture non-target animals. The potential to capture smaller animals such as coyotes and red fox in foot-hold traps or foot snares would be reduced substantially by using pan-tension devices set at a high enough triggering tension to prevent it from triggering the trap or foot snare. Coyotes and red fox are smaller than wolves and therefore not likely to enter neck snares set for wolves. Coyotes are abundant and widespread in Oregon and can withstand very high harvest levels. Similarly, fox can withstand recreational and damage management harvest levels (Personal communication with Tom Thorton, ODFW Game Program Manager 6/1/2012). Any low level capture would be negligible in terms of effects on their populations.

Wolverines and kit fox are both state listed species that could potentially be affected. However, due to their smaller size, capture of these species is not expected for the reasons discussed for coyotes and red fox.

Similarly, effects on raptors including bald and golden eagles would not be expected due to the use of pan-tension devices.

It is possible, though unlikely that a bear or cougar may be captured in a foot-hold trap or foot snare set for wolves. In Idaho, WS has never captured these species while conducting wolf removals despite a comparatively high level of take of wolves (USDA 2011a). Black bear and cougar are both abundant and widespread in Oregon, so in the unlikely event of a capture, there would be no effect on the population level. ODFW and WS personnel are both trained, experienced and equipped to administer chemical immobilization drugs to any cougar or bear incidentally captured, and thus would it would be likely to be released unharmed.

The Canada lynx is a threatened species under both federal (65 FR 16051) and State ESA (ORS 496.171-496.192). It is considered to be an occasional visitor in Oregon (Verts and Carraway 1998, Cooper 2001, McKelvey and Aubry 2001), with no known populations and no indication that a resident population ever occurred in Oregon Vol. 68, No. 128 (USFWS 2003). Canada lynx inhabit montane coniferous forests and are specialized predators that are highly dependent on the snowshoe hare (*Lepus americanus*) for food, although they will eat alternate prey such as squirrels and grouse. Given an extremely low incidence

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

of confirmed lynx observations in Oregon, it is extremely unlikely that wolf damage management would result in the capture of a lynx.

### Human Safety

The methods to be used by ODFW if WS did not take action would be the same as those used by WS. WS's use of traps and foot snares have not presented any substantial safety risks to people, and this has been verified by a formal risk assessment of WS methods (USDA 1997, Appendix P ). Humans are not likely to be exposed to any management methods due to the minimal use of management tools, the remote locations, and communication and coordination with land owners.

People directly affected by wolf depredations on domestic animals, especially pets that are killed in their yards, express concern for human safety. Wolves that have become habituated to humans are unpredictable and may attack people or pets (Linnell et al. 2002, McNay 2002). In many situations where wolves may pose a risk to health and safety, management of human behavior and non-lethal techniques for wolves may be sufficient to resolve the problem; however, in some situations, removal of the problem individual may be the most appropriate solution (IDFG 2008).

### **4.1.3 Social and Aesthetic Perspectives**

Wildlife generally is regarded as a source of economic, recreational, and aesthetic benefits (Decker and Goff 1987), and the mere knowledge that wildlife exists is a positive benefit to many people. Under this alternative, WS would not take action to remove wolves and would not directly affect those with strong opinions on this aspect of wolf damage management or on humaneness, nor would WS have any positive or negative effect on the ability of the public to potentially experience wolves in the wild. The No Action alternative would include ODFW and others taking actions to resolve wolf depredation using lethal means where authorized.

### Human attitudes towards wolves

The arrival of wolves in Oregon has sparked intense interest throughout the state as Oregonians debated the possibility and acceptability of wolves dispersing into Oregon from Idaho and establishing a permanent population. Views range from concern about the effects of wolves on livestock and native ungulates to support for the return of a native species (ODFW 2010a).

Human attitudes toward wolves in North America have undergone significant changes during the second half of the 20<sup>th</sup> century. Strong support for wolf conservation has been documented throughout the United States (Mech and Boitani 2003). Cultural influences such as popular literature, the work of

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

researchers, and the voice of conservationists such as Aldo Leopold have provided information and support for conservation. A 1999 poll of Oregonians showed a 70% support rate for the return of wolves to the state.<sup>10</sup> These changes in wildlife values are embodied in the federal ESA and the Oregon ESA enacted in 1979. However, values and attitudes in the United States are complex and not homogenous. They depend on area of residence (rural-urban), occupation (agriculture/ natural resource-technical/service), and many other factors (ODFW 2010a).

Maintaining a balance between human and wildlife needs requires sensitivity and consideration of divergent viewpoints. In addressing the conflicts between wildlife and people, wildlife managers must thoughtfully consider not only the needs of those directly affected by wildlife damage and the environmental issues, but also a range of sociocultural and economic factors. Wildlife is a valuable public resource. ODFW is responsible for maintaining healthy, viable resident wildlife populations, which now includes among others, gray wolves. Accordingly, when wildlife causes damage, the ODFW has an obligation to respond to that damage. WS normally provides assistance upon request of state governments or others to manage damage by wildlife.

Considerable information from prominent social theory and research shows that tolerance toward a wildlife species is influenced by the value of losses attributable to that species, the benefits attributable to the species by the affected individual, and by the perception of the risk of losses as controlled or voluntary (Slovic 1987). Risks considered involuntary by an individual are less likely to be viewed as acceptable whereas risks that can be controlled are generally considered to be more acceptable. Risk theory and associated research (*e.g.*, Slovic 1987) suggest that a government which simultaneously imposes the risk of wolf depredation (*i.e.*, supports wolf recovery) and prohibits individuals from effectively reducing those risks (*i.e.*, no chance for removal of problem wolves) is creating an intolerance of the wolf presence. In effect, this situation lowers the social carrying capacity for wolves (tolerance level) and could threaten the wellbeing of the population, both presently and in the future if the situation persists. Livestock producers have the capability to resolve their own depredation problems, either legally or illegally, with or without assistance from the government (Dorrance 1982). If no government-sanctioned relief from the loss of livestock is in sight, intolerant individuals will likely adopt anti-wolf behaviors including illegal killing (Fuller et al. 2003). In this scenario, social carrying capacity effectively will be lowered because individuals erroneously turn their attention to the wolf population at large as the primary cause of wolf problems.

---

<sup>10</sup> 12 Poll by Davis & Hibbitts, April 1999. Accuracy estimate is +/- 5 percent (OWCMP 2010).

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

There has been some question as to whether lethal removal of depredating wolves (*e.g.*, those involved with confirmed cases of livestock depredation) can prevent or minimize the development of negative public attitudes, or even foster greater tolerance toward wolves and therefore enhance the survival and recovery of the species. Although the liberal killing of wolves by humans caused wolves to initially become endangered in the U.S. south of Canada, and across much of Europe (Mech 1970, Lopez 1978, Thiel 1993), highly selective lethal removal of individual wolves or wolf packs by governmental agencies is considered by many professional biologists to be an important part of recovery and conservation programs for wolves (Sillero-Zubiri and Laurenson 2001, Boitani 2003, Breck and Meier 2004). For example, Dr. David Mech, has written that “lethal control will remain the ultimate means of curbing wolf damage to livestock and pets” (Mech 1995). He further states that, “Direct lethal control is still usually the only practical course under most conditions”. Mech (1995) argued that a more flexible system of lethal controls could actually allow wolves to occur over much larger portions of North America, if problem animals can readily be controlled.

The Wildlife Society, an international organization of professional wildlife biologists, especially focused on North America, stated in their technical review on the restoration of wolves in Western North America that “Control of wolves preying on livestock and pets is imperative and should be prompt and efficient if illegal killing is to be prevented and human tolerance of the presence of wolves is to be maintained (Peek et al. 1991).” Musani et al. (2004) noted that in western North America, the rate of expansion of depredation has been less than the rate of wolf population growth, and attributed this trend to elimination of individuals and packs from the population that had learned to kill livestock.

Research indicates that public support for the presence of large carnivores largely depends on confidence that problems caused by individual animals will be resolved effectively. A public attitude survey of residents in Nine Mile Valley, Montana found that 65% of wolf supporters might change their support for the presence of the population if wolves that kill livestock were not controlled quickly or effectively (Wolstenholme 1996). In a study that examined which factors would encourage residents of the Flathead Indian Reservation to support protection of grizzly bear habitat on private lands, Frost (1985) found that rapid assistance to bear-related problems was the most important factor, with 76% of respondents desiring that assurance. By contrast, only 42% of respondents felt that compensation for livestock losses was a valid incentive for supporting protection.

Studies have also shown that local acceptance of wolves is improved if government lethal controls are allowed on problem wolves. In a 1995 survey of American households, 60% of respondents supported removing predators that preyed on livestock (Reiter et al. 1999). Prior to the 1995 reintroduction of

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

wolves into Wyoming, a larger proportion of residents surveyed supported wolf recovery than opposed it (44 vs. 34.5%), but the majority of respondents supported killing of wolves (58.5%) that killed livestock (Thompson and Gasson 1991). Similarly, Wisconsin surveys indicate that residents, especially rural people in wolf range accept and expect control of wolves that kill livestock or pets on private land. In a 2001 survey of Wisconsin bear hunters, farmers, and residents in wolf range, 52.5 % expressed support for destroying wolves that had killed livestock or family pets (Naughton-Treves et. al 2003). Support for killing problem wolves was highest for bear hunters (77%), lowest for general residents (32%), and intermediate for farmers (45%) (Naughton-Treves et al. 2003).

In a more recent Wisconsin opinion survey, a stratified random sample of zip codes was used to survey urban areas outside wolf range, rural areas outside of wolf range, urban areas in wolf range, and rural areas in wolf range (Naughton et al. 2005). Respondents were also compared by contributors to endangered resources programs verse non-contributors, as well as livestock producers and non-producers. Non-contributors supported translocation of wolves slightly above lethal control on problem wolves (35% vs. 45%), but among endangered resources contributors there was a much lower preference for lethal control (14%), compared to translocations (53%). However, the survey asked persons if they preferred translocation of problem wolves to wilderness areas, compared to lethal control or other actions, but it was not clear if respondents were aware of feasibility and problems with translocations. When asked about reliability of killing only the problem wolves, only 5% of endangered resource contributors and 11 % of non-contributors said they opposed all lethal controls. Among livestock producers 46 % preferred lethal control. If lethal control of wolves was to be done, about 70% of respondents preferred government agents conducting the controls (Naughton et al. 2005).

A survey of random Wisconsin residents was conducted in 2003 of general attitudes toward wolves (Schanning et al. 2003). A total of 66.4% of respondents to this survey supported the Wisconsin Department of Natural Resources (WDNR) shooting problem wolves, and 54.4% supported translocation of problem wolves. For problem wolves killing livestock, 43.7% of respondents agreed these wolves should be killed, and 19.9% were neutral on WDNR killing of such wolves, but 63.2% of respondents agreed that farmers should have the right to kill wolves that kill or injury livestock. It does appear that with adequate justification, the majority of respondents support or do not oppose the killing of problem wolves.

In Minnesota, 80% of residents had positive attitudes toward wolves, including 60% of the farmers, but farmers (83%), and northern Minnesota residents (71%) expected wolves that killed livestock to be eliminated (Kellert 1999). Thus it

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

appears that even where there is strong support for wolf conservation, most people in wolf range expect problem wolves to be removed.

Compensation programs in other states have been designed to assist livestock producers by reimbursing them for losses attributable to wolves, with the intention of increasing overall public acceptance for wolf populations (Fritts et al. 2003). The expectation that compensation will increase tolerance for wolves is based in part on an assumption that livestock producers primarily perceive wolf depredation as an economic problem. Recent research has shown that compensation programs have not substantially improved wolf tolerance by producers and that other, non-economic factors more strongly influence attitudes toward wolves among this group (Naughton-Treves et al. 2003, R. B. Peyton, MSU, personal communication *in* MDNR 2008).

Nevertheless, public support for a compensation program in Oregon was clearly expressed during wolf town hall meetings held by ODFW throughout Oregon during 2002 and 2003. Additionally, a 1999 poll of Oregonians (Davis and Hibbitts 1999) demonstrated public support for the return of wolves to the state and for compensation to livestock producers for wolf-caused losses.

Many people who support wolf restoration view the payment of compensation as an opportunity to share what they perceive to be a burden they do not wish livestock producers to have to bear alone. Some livestock producers whose parents and grandparents struggled over the last 150 years to eradicate wolves from Oregon strongly object to having to suffer any wolf-caused livestock losses and strongly supported payment for those losses in exchange for allowing the wolf to return (ODFW 2010a).

### Humaneness

Under this alternative, wolves would be trapped, captured by cable restraints, or shot by experienced ODFW personnel as humanely as possible using the best methods available. All activities would be conducted in accordance with Oregon Administrative Rules and ODFW guidelines to minimize the amount of time target and non-target animals remain in traps, and improve the likelihood that a non-target animal may be released unharmed.

Wolves may also be shot by producers, where they are under State and not federal jurisdiction, under ODFW permit, if caught in the act of attacking or killing livestock. The humaneness of private individuals shooting wolves would depend on the skill of the individual and their ability to make a quick and efficient kill.

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

Some individuals would consider this alternative inhumane because they oppose all lethal methods of damage management. Others will be opposed to this alternative because they object to specific lethal wolf damage management methods like traps and cable restraints and perceive these methods as being unjustifiably cruel and inhumane. Some individuals would prefer that cage traps be used to capture wolves and would perceive this method as being more humane than traps and cable restraints. Unfortunately, the use of cage traps to capture wolves is both impractical and ineffective because it is extremely difficult to get a cage trap big enough for an adult wolf into remote locations, and because it is rare to capture an adult wolf in a cage trap (USDA 2006). Individuals with animals that have been injured, threatened or killed by wolves may see this alternative as being acceptable because it includes necessary lethal actions to help prevent further injuries to their livestock and pets.

Finally, livestock owners feel that they have a right to protect their property, and may consider it unacceptable that their domesticated animals be subjected to harm by wolves. People have bred the defensive capabilities out of many domestic animals and may feel they have an obligation to protect them from wildlife.

### Aesthetic Effects

Aesthetics is the philosophy dealing with the nature of beauty, or the appreciation of beauty. Therefore, aesthetics is truly subjective, dependent on what an observer regards as beautiful. Direct benefits are derived from a user's personal relationship or direct contact with wildlife and may include either consumptive (*e.g.*, using or intending to use the animal such as in hunting or fishing) or non-consumptive use (*e.g.*, observing or photographing animals) (Decker and Goff 1987). Indirect benefits, or indirect exercised values, arise without a human being in direct contact with an animal and are derived from experiences such as looking at pictures or videos of wildlife, reading about wildlife, or benefiting from activities or contributions of animals such as their use in research (Decker and Goff 1987). Two forms of indirect benefits exist according to Decker and Goff (1987): bequest and pure existence. Bequest benefits arise from the belief that wildlife should exist for future generations to enjoy; pure existence benefits accrue from the knowledge that the animals exist in the human environment (Decker and Goff 1987) or that they contribute to the stability of natural ecosystems (Bishop 1987).

Some people directly affected by problems caused by wolves insist on the lethal removal of the problem animal(s) from the area where the conflict occurs. Others have the view that all wildlife involved in conflicts should be captured and relocated to another area to alleviate the problem. Individuals not directly affected by a conflict may be supportive of affected humans, neutral, or totally opposed to any removal of wildlife from specific locations or sites.

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

Those who oppose removal of wildlife may do so because of emotional or spiritual ties to the animals, which are similar to the bonds that may exist between a human and a pet. Some may totally oppose wolf damage management, especially if lethal methods are used, and want management agencies to teach tolerance of wolves causing conflicts. These individuals generally believe that individual animals have inherent value and should not be killed to meet the desires of man-kind. They may also feel that individual animals have rights similar to those of humans and that, if it is inappropriate to treat a human in a given manner, then it is also inappropriate to treat an animal in that manner.

Under this alternative WS would not remove wolves. Since ODFW and CTUIR would remove problem wolves in this case (Appendix B), the ability to view and aesthetically enjoy wolves at a particular site could be temporarily limited if the wolves are removed. New animals would most likely reoccupy the site in the future if suitable habitat exists, although the length of time until new wolves arrive is variable, depending on the habitat type, time of year, and population density of wolves in nearby areas. Given the objectives of the OWCMP (ODFW 2010a) to conserve wolves to the point of recovery, while managing conflicts, and given that wolves are expected to continue to expand in number and range in Oregon (Section 4.1.1), the current program alternative and environmental status quo will not jeopardize the viability of the wolf population, thus opportunities to view, hear, and aesthetically enjoy wolves will likely be available to the public and grow over time as wolves reach recovery and management stages.

### **4.1.4 Effectiveness**

The integrated and adaptive approach employed by ODFW under the OWCMP (ODFW 2010a) incorporates the use of lethal and non-lethal measures to stop or reduce the likelihood of wolf damage. In assessing the effectiveness of various management approaches to dealing with wolf predation on livestock in the NRM area, Bangs et al. (2009) concluded that while non-lethal tools were temporarily helpful in some situations, they were generally ineffective, particularly in areas that simply would have too many livestock conflicts for wolf packs to persist. (Scaring wolves away from one specific location in an area with large numbers of livestock everywhere simply results in the wolf conflicts with livestock in adjacent areas where focused non-lethal efforts are not being employed). Bangs et al. (2009) also concluded that lethal management of problem wolves was usually effective in reducing conflict because it: 1) enhanced effectiveness of non-lethal control measures, 2) interrupted use of livestock as food by surviving wolves, 3) removed offending individuals, 4) reduced wolf density in conflict areas, 5) eliminated packs where chronic livestock depredations had been occurring, 6) helped to keep wolf packs out of unsuitable habitat, 7) made surviving pack members temporarily avoid or be more wary of people and/or

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

areas with livestock, 8) reduced the pack's overall need for food, 9) made it more difficult for the fewer remaining pack members to kill larger prey like adult cattle or attack calves protected by cows, 10) increased the detection rate of subsequent depredations because livestock carcasses were consumed more slowly (so additional control could be applied more rapidly), 11) reduced compensation and control costs, and 12) moderated some of the public anger over wolf predation on livestock. Mech (1995) similarly concluded that in most circumstances, lethal removal of wolves was usually the only practical approach to resolving incidents of wolf predation on livestock.

Karlsson and Johansson (2009) reviewed data on livestock predation by brown bears, wolves and lynx on farms in Sweden and concluded that the risk of predation greatly increased during the first several weeks after an initial predation incident. They suggested that control efforts, whether lethal or non-lethal, would be most effective if applied during this period of time following an initial depredation event. Bradley (2004) found that after partial or complete wolf pack removal, depredations usually ceased for the remainder of the given grazing season. However, the majority of packs that were partially removed (68%) depredated again within the year. Where entire packs were removed, the rate of re-colonization was high (70%) and most re-colonization (86%) occurred within a year of removal of the previous pack; most packs (86%) that recolonized the same area were implicated in depredations. Packs in which breeders were removed were no less likely to cause depredations again within the year than packs with non-breeders removed.

Although non-lethal methods are often only temporarily effective, they may sometimes offer protection for a long enough period of time to protect a resource when it may be most vulnerable. An example is the use of the RAG box in small calving pastures. Breck et al. (2002) reported that this frightening device, activated by the radio signal from an approaching radio-collared wolf, was effective in keeping a radio-collared wolf pack away from several small calving pastures in central Idaho for 60 days. However, this device is only useful in those cases where at least one and preferably multiple wolves in the pack are radio-collared, and it is only useful for protecting relatively small areas. Fladry has also been used in to deter wolves for up to 60 days before the wolves habituated to it and began killing livestock again (Musiani et al. 2003). One consideration in the use of these temporarily effective non-lethal methods, is, that if wolves will eventually be lethally removed anyway (after habituating to the frightening stimulus), the investment of time and resources in the non-lethal efforts may not be practical.

One of the most effective non-lethal deterrents to wolf predation may be the on-site presence of humans who remain near the livestock and are vigilant in trying to detect the presence of wolves so they can be consistently frightened away

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

(Shivik 2004). These efforts can be more effective if there are radio-collared wolves in the area and the livestock guardian personnel make use of radio-telemetry receivers to detect the nearby presence of wolves. The costs to provide 24/7 human presence around livestock would ordinarily be cost-prohibitive for livestock producers, but in some situations, outside parties with an interest in wolf conservation have provided such assistance at no cost to livestock producers, in order to promote greater tolerance for wolves. The Defenders of Wildlife have paid for such efforts in the Big Wood River drainage of central Idaho during several recent summer grazing seasons, and while these efforts have not been 100% effective in eliminating wolf problems, they appear to have been effective in reducing the number of wolf attacks on sheep and livestock guarding dogs in this area (USDA 2010).

Bangs and Shivik (2001) reported that while some non-lethal methods may be temporarily effective, many are expensive to implement and none available at the time of their report were widely effective. Many non-lethal methods of preventing livestock losses to wolves have been tried and abandoned in the United States and Europe because of lack of effectiveness. Use of guard dogs alone has been tried against wolves in Minnesota with only limited success (Fritts et al. 1992). Coppinger and Coppinger (1996) showed the dominance of wolves over livestock guarding dogs in direct confrontations, and Coppinger and Coppinger (1996) and Bangs et al. (1998) reported that wolves have killed livestock guarding dogs. Wolves have also been translocated to other areas, but many either returned to where they were caught or became a problem elsewhere (Fritts et al. 1984, 1985). Mech et al. (1996) concluded that where wolf populations are large and secure, translocation has little value in wolf management. Aversive conditioning (Gustavson and Nicolaus 1987, Shivik and Martin 2001, Shivik et al. 2003) has not yet proven effective with wild wolves (Fritts et al. 1992). Electric fencing may hold some promise for protecting livestock from wolves, but fences tested for coyotes have been extremely expensive, high maintenance, and better suited for small areas (Dorrance and Bourne 1980, Nass and Theade 1988, Paul and Gipson 1994), rather than range operations.

In looking at the possible role of livestock husbandry practices in reducing wolf predation, Bradley and Pletscher (2005) assessed multiple factors potentially related to wolf depredations on cattle in fenced pastures in Montana and Idaho. They concluded there was no relationship between depredations and carcass disposal methods, calving locations, calving times, breed of cattle, or the distance cattle were grazed from the forest edge. They did find that depredations were more prevalent in pastures where elk were more likely to occur, where the pastures were larger in size, had more cattle, and where cattle were grazed farther from residences than pastures without depredations. Mech et al. (2000) likewise concluded there were essentially no differences in husbandry practices between farms in Minnesota that suffered chronic wolf depredations, as compared to

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

similar operations which experienced no depredations, and that farms with cattle farther from human habitation suffered more losses.

Haight et al. (2002) and Cochrane et al. (2003) reported on a model developed to assess three different strategies for reducing wolf predation on livestock, including: 1) reactive management, where wolf removal occurred soon after depredations occurred, 2) delayed reactive management, where wolf removal occurred in the winter months prior to the grazing season in areas with a history of previous depredations, and 3) population-size management, where wolves were removed annually in the winter months from all areas near farms. The authors' concluded that: 1) each of these approaches reduced predation by about half compared with no action, 2) delayed reactive management and population-size management actually removed fewer wolves than reactive management because wolves were removed in winter before pups were born, and 3) population-size management was least expensive because repeated annual removal kept most territories near farms free of wolves. The OWCMP (ODFW 2010a) allows lethal methods to only be used as a reactive approach.

The compensation program may not stop damages from occurring (Klenzendorf, 1997, Wagner et al. 1997). Financial assistance to producers who use non-lethal methods and wolf deterring management techniques may not enhance efficacy since non-lethal measures alone have not always been successful in stopping damages (Section 4.2.4). Therefore, the compensation and financial assistance aspect of this alternative is not expected to add any notable measure of reduction of livestock losses. Kruuk (2002) and Naughton-Treves *et al.* (2003) reported that farmers may continue to kill wildlife illegally even when they have been compensated. There is also a risk that people will be more frustrated at the failure of an inadequate compensation program or cessation of a successful one than if none were in place at all (Wagner et al. 1997).

In conclusion, non-lethal methods are used and recommended but not always successful in stopping or reducing damages, especially over time and must be supplemented with lethal methods. ODFW's approach is to allow for limited lethal removal of wolves after they have been confirmed to have been involved in chronic livestock depredation. ODFW has indicated that it would target wolves for lethal control, similar to the proposed action, however without additional assistance from WS, service to landowners may be reduced or delayed, thus wolf depredation on livestock may increase (Appendix B). Lethal removal is effective as discussed above, but the efficacy of this approach is probably limited by the fact that conservation goals must be balanced with producer needs to protect livestock.

### **4.2 - Alternative 2 – Non-lethal Actions Only**

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

The Non-lethal Actions Only Alternative means that WS would assist livestock producers, other members of the public, tribes, and ODFW with technical assistance or non-lethal management actions. WS would not assist ODFW or CTUIR with lethal damage management to protect livestock or human safety in Oregon. ODFW and CTUIR would however, take the same actions as those described under the No Action alternative, thus lethal control would still occur. The cumulative effects of such actions are similar to the current environment under which wolves exist, and are discussed as the environmental baseline, or the environmental status quo in Section 4.1.

### **4.2.1 Impact on wolf population**

#### Direct effect

WS would have no effect on wolves in terms of removals. WS would assist livestock producers with non-lethal techniques, either through technical or direct assistance.

#### Cumulative effects on gray wolves in Oregon

The cumulative effects on wolves would be similar to that described under Section 4.1.1. ODFW currently has responsibility for wolf management in the eastern  $\frac{1}{3}$  of Oregon, Oregon's section of the NRM DPS, outside of sovereign tribal lands. CTUIR has management authority on sovereign tribal lands within their boundary. Ranchers and livestock producers must work directly with ODFW when wolf/livestock conflicts occur in the area of the Oregon under state management or CTUIR on tribal lands. Livestock producers that see wolves on their property or suspect wolves have attacked livestock are instructed to immediately call ODFW, WS, tribal or county officials. WS would respond by providing non-lethal assistance, provide assistance in identification of wolf predation and notify ODFW and or CTUIR of this information. Because ODFW and CTUIR would implement OWCMP (ODFW 2010a and OAR 635-110, and Appendix B) as discussed in Section 2.1, individual wolves are expected to be removed when and where a need exists and in which meets the requirements for removal. In addition, producers in areas where wolves are managed by the state (currently within the NRM DPS boundary), and who have been issued an ODFW permit may kill wolves that have been caught in the act of killing livestock, as discussed in Section 4.1.1.

Because ODFW would implement OWCMP (ODFW 2010a) with or without the assistance of WS and CTUIR has stated that they will implement their response plan (Appendix B), effects on wolf populations, both locally, and statewide, would be similar to the No Action Alternative.

### **4.2.2 Impacts on non-target animals and human safety**

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

### Non-target animals

WS would have little to no effect on non-target species or humans under the Non-lethal Methods Only alternative.

Foot snares and foot-hold traps are non-lethal capture methods which could capture non-target animals, however as discussed in Section 4.1.2, those risks are low where ODFW or WS would be implementing these measures.

Similar to Section 4.1.1, wolf removal actions by ODFW are expected to occur at a low frequency and in limited and isolated geographic locations because wolves are not yet numerous or widely distributed in Oregon. Given the professionalism and expertise of ODFW biologists, their proven skill in capturing wolves in recent years, both for removals and for the purposes of radio collaring and monitoring, and the selectivity of the management methods, non-target animals, including T&E species will not likely be affected or the risk is very low.

Because non-lethal methods are used and promoted anyway, and because ODFW could and would implement lethal methods under this alternative as indicated in OAR 635-110, the risks to non-target animals is expected to be similar to the No Action Alternative.

### Human Safety

Non-lethal methods used by WS are not likely to affect human safety due to standard operating procedures designed to minimize exposure and risk (see Section 2.3 for a list of measures designed to minimize risk).

Lethal methods would be used by ODFW in the absence of any assistance in lethal control by WS, and thus would present no change in human safety risk from that of the current environmental baseline (the No Action alternative).

In the unlikely event that wolves threatened human safety, ODFW would take actions as allowed under OAR 635-110 (Appendix A).

### **4.2.3 Social and Aesthetic Perspectives**

Non-lethal methods are almost always preferred when they are effective. It is WS policy to give preference to non-lethal methods when they are both practical and effective (WS Directive 2.101). Non-lethal actions are also generally preferred by members of the public. However, members of the public who experience wolf threats to or losses of livestock, as well as some pet owners, feel that they have a right to protect their property, and may consider it unacceptable that their

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

domesticated animals be subjected to harm by wolves by using non-lethal methods if they are not effective. People have bred the defensive capabilities out of many domestic animals and thus may feel that they have an obligation to protect them from being killed by predators.

As discussed in Section 4.1.3, livestock producers, some rural residents, and hunters would be more likely to approve of the most effective methods that will reduce wolf damages, and some members of the public would prefer if wolves were removed from Oregon.

Because ODFW would take necessary action to lethally remove wolves under this alternative (Appendix B), ultimately, social perspectives would be expected to be similar to the No Action Alternative.

### Humaneness

WS supports the most humane, selective, and effective damage management techniques. Under this alternative, WS would continue to incorporate advances of non-lethal measures into program activities and would expand its role in non-lethal management actions. WS field specialists that would use non-lethal methods to harass or capture wolves for radio collaring, are experienced professionals, skilled in the use of management methods and committed to minimizing pain and suffering. However in the case of rubber bullets, some level of discomfort is necessary to achieve the desired results.

The effects of this alternative would be similar to the No Action alternative because of the role of ODFW in implementation of OWCMP (ODFW 2010a) which allows for lethal removal under circumstances discussed in Section 2.1, and detailed in OAR 635-110, and because the No Action alternative already encompasses non-lethal measures.

### Impact of wolf removal on public aesthetic enjoyment

Under the non-lethal only alternative, WS would have no effect on the ability of the public to enjoy wolves since it would have no effect on individual wolves or the wolf population. However for the reasons discussed under the No Action alternative, ODFW would take any necessary lethal actions and wolves would be affected similar to the No Action alternative. Thus, the ability of the public to potentially enjoy wolves in their natural habitat would be the same as Alternative 1, No Action.

### **4.2.4 Effectiveness**

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

The integrated and adaptive approach employed under the current wolf damage management program in Oregon requires that non-lethal methods be used and that damage occurs before agency implemented lethal management measures may be used to stop or reduce the likelihood of further wolf damage to livestock. In assessing the effectiveness of various management approaches to dealing with wolf predation on livestock in the NRM, Bangs et al. (2009) concluded that while non-lethal tools were temporarily helpful in some situations, they were generally ineffective, particularly in areas that simply would have too many livestock conflicts for wolf packs to persist. (Scaring wolves away from one specific location in an area with large numbers of livestock everywhere simply results in the wolves killing livestock in adjacent areas where focused non-lethal efforts are not being employed).

Non-lethal measures are already an important part of the OWCMP and are used when they are effective. ODFW may authorize its personnel or agents to use lethal force to remove wolves due to livestock losses when non-lethal methods to solve wolf-livestock conflict have been tried, documented by the requester, and deemed ineffective. Therefore, because non-lethal methods are used when they are effective, and because ODFW may use lethal methods under the same circumstances as discussed under the No Action alternative, the effectiveness of this alternative is similar to Alternative 1, No Action. Sections 2.2 and 4.1.4 contain discussions of the efficacy and limitations of non-lethal approaches.

### **4.3 Alternative 3 – Proposed Action WS IWDM Assistance to ODFW**

WS Proposed Action Alternative is to assist livestock producers, tribes, and ODFW with an integrated approach of technical assistance, wolf damage identification, and both non-lethal and lethal damage management approaches as defined by OAR 635-110 and the OWCMP (ODFW 2010a). ODFW would continue to implement aspects of the OWCMP (ODFW 2010a), and the two agencies would cooperate to provide the assistance necessary to respond to wolf complaints and resolve depredation. This alternative is almost identical to the No Action alternative except that WS could respond to ODFW's request to provide assistance to ODFW and landowners to remove problem wolves under conditions outlined in OAR 635-110 (Appendix A). Additionally, WS could provide assistance with lethal control for CTUIR under their authority and response plan. WS assistance with lethal removals would only occur during wolf conservation and management phases I and II, as defined in OWCMP (2010a) and OAR 635-110 and Section 2.3, the Proposed Action alternative.

#### **4.3.1 Impact on wolf population**

As of December 2011, ODFW confirmed that there are a minimum number of 29 wolves in Oregon, with four packs in eastern Oregon.

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

### Direct effect

Effects on wolves, both in terms of non-lethal deterrent effects, harassment, and lethal removals would result in a similar level of mortality as the No Action Alternative. Under this alternative, WS may respond to ODFW, CTUIR, and landowner requests to remove individual problem wolves under the conditions of OAR 635-110 (Appendix A) or sovereign tribal authority as described under Sections 2.1 and 2.3. Because WS has trained wildlife specialist in the field, this alternative may expedite removals and result in enhanced service to landowners experiencing confirmed wolf damages (Appendix B). It would not be likely to result in more wolves removed since ODFW and CTUIR would respond if WS could not (Appendix B).

This alternative would also allow WS to act on the behalf of CTUIR, or as an agent of landowners with ODFW permits to remove wolves caught in the act of biting, wounding or killing livestock. ODFW issues “caught in the act” permits to livestock producers after livestock losses have occurred and non-lethal efforts to resolve the problem were deemed ineffective. Because wolves usually target livestock at night and tend to avoid people, the opportunity to take wolves under permit conditions would be rare. Therefore, WS would likely remove few to no wolves under landowner permits or tribal requests to remove wolves “caught in the act”.

### Cumulative effects on gray wolves in Oregon

The cumulative effect on local populations of gray wolves in Oregon is likely to be similar to the No Action alternative since ODFW is already implementing the OWCMP (2010a), per OAR 635-110, and therefore, would, and indeed has responded to wolf damage complaints in the absence of WS assistance (Section 4.1.1 and Appendix B). Similarly, CTUIR has indicated that it would remove confirmed problem wolves if WS were not available to assist (Appendix B). Because ODFW must make all decisions regarding individual wolf removals on non-tribal lands, and because WS would be bound to the measures discussed in the OWCMP (ODFW 2010a), the discussion and findings under of the No Action Alternative (Section 4.1.1), in which ODFW and CTUIR would act if WS did not, would be expected to be similar.

Under this alternative, WS would provide assistance to ODFW with both lethal and non-lethal wolf depredation management. By providing ODFW with lethal depredation management assistance, ODFW would be able to focus its resources on its program to enhance wolf recovery including: funding for non-lethal control supplies; wolf damage management of other packs; and implementation of capture, monitoring and research programs including those needed to assess population viability and health (Appendix B). Therefore, when compared with the

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

No Action (current program) and Non-lethal Only alternatives, the proposed action alternative would result in the greatest overall potential for wolf conservation by allowing ODFW to focus more of its resources on wolf conservation and recovery efforts.

Ultimately, based on WS assistance to ODFW in implementation of OAR 635-110 and OWCMP (ODFW 2010a), ODFW's public education and outreach, and the cautious and conservative approach to reducing wolf depredation, wolves are expected to continue to expand in Oregon and establish populations in suitable habitat including the Oregon Cascades. Based on habitat connectivity and an abundance of wolves in other regions of the NRM DPS, it is reasonable to expect that wolves will expand within the foreseeable future to meet state delisting criteria in Oregon.

Because Oregon wolf conservation and management is a relatively new issue, WS has limited its proposed role in using lethal depredation management methods to Phases I and II of OWCMP (ODFW 2010a) and OAR 635-110. The wolf population at ODFW's Phase II Management would be five to seven breeding pairs per zone, where each zone may be in a different management phase.

### **4.3.2 Impacts on non-target animals and human safety**

#### Non-target animals

WS would have little effect on non-target animals for the reasons discussed under Section 4.1.2 since ODFW and WS non-target take would be expected to be similar. While there may be some risk to larger non-target animals such as potentially bear or cougar, the level of use of lethal tools would be so low as to render any non-target take unlikely.

The Canada lynx, an occasional visitor to Oregon, is discussed in Section 4.1.2. Wildlife Services has consulted with the USFWS, pursuant to the federal Endangered Species Act, for potential program effects on the Canada lynx. The USFWS concurred with WS conclusions in a letter dated February 29, 2012, that WS proposed wolf damage management activities would not be likely to adversely affect the Canada lynx (Appendix C). No other T&E species are expected to be taken, for the reasons discussed under Section 4.1.2.

WS Standard Operating Procedures to minimize the capture of non-target animals is discussed in Section 2.3.

#### Human Safety

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

The methods proposed by WS would be the same as those used by ODFW under the No Action alternative. WS is unaware of any impacts to public health or safety associated with agency implementation of wolf damage management methods in other states.

Aerial operations would likely occur in relatively remote areas with no or very low human presence on the ground. A formal risk assessment of methods used in wildlife damage management concluded there was very little, if any, risk to the public from WS aerial shooting activities (USDA 1997, Appendix P). Other analyses of aircraft accidents by WS concluded that the accident rate for WS pilots and aircraft is not significantly different from rates reported for general aviation and that the risk of harming any member of the public is exceedingly low (USDA 2005, 2011a, 2011b). We find no reason to believe that aerial operations used in wolf damage management would present any significant risk to public health or safety in Oregon.

WS' traps and snares are strategically placed to reduce the likelihood of exposure to the public. Appropriate warning signs are posted at access points to areas or properties where traps or snares are set to alert the public of their presence (WS Directive 2.450). There have been no direct injuries reported to WS, USFWS or IDFG personnel or the public from WS wolf management activities in Idaho, despite removal efforts that are relatively high compared with those that would be expected in Oregon.

Humans are not likely to be exposed for the reasons discussed under Section 4.1.2. WS's use of traps and foot snares have not presented any substantial safety risks to people, and this has been analyzed in a formal risk assessment of WS methods (USDA 1997, revised, Appendix P).

Similar to the No action alternative, this Alternative could provide relief from damage or threats to public health and safety for people who would have no relief from such damage or threats if non-lethal methods were ineffective or impractical.

### **4.3.3 Social and Aesthetic Perspectives**

#### Humaneness

People's perspectives on wolf damage management and on the removal of wolves under the proposed action would be expected to be similar to the No Action and Non-lethal only alternatives since wolves would be removed in a similar manner and number, under the same criteria (ORS-635-110), and for the same reasons. While WS may act as an agent to landowners holding caught in the act permits, additional take is unlikely for the reasons discussed under Section 4.3.1.

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

With regard to the humane treatment of wolves, the proposed action would be similar to the other alternatives as far as lethal methods that WS would use (as discussed in Section 4.1.3). WS would continue to provide non-lethal technical assistance to producers. The overall humaneness of the wolf management program may be enhanced under the proposed action alternative because by assisting ODFW with unplanned lethal depredation response efforts, ODFW would not need to divert resources from other activities including its non-lethal supply program (Appendix B).

With regard to the perspective of livestock producers and others who feel that domestic animals should be protected from predation, this alternative would probably be considered more humane than the other alternatives because WS may be able to respond to ODFW's request for lethal removals faster and more efficiently than ODFW agents could. WS already has agents in the field that have the expertise to identify and resolve wildlife damages. By expediting response times, the potential for continued or additional wolf depredation on livestock can be reduced. Enhancing agency depredation management efficiency is likely to promote social tolerance of wolves in Oregon, as discussed under Section 4.1.3.

### Aesthetic effects

The ability to view and aesthetically enjoy wolves at a particular site could be temporarily limited if the wolves are removed. New animals would most likely reoccupy the site in the future if suitable habitat exists, although the length of time until new wolves arrive is variable, depending on the habitat type, time of year, and population density of wolves in nearby areas. While non-consumptive users could be affected temporarily by localized removals (especially if they recreated in areas where wolf/livestock conflicts were occurring), the overall effect would be beneficial in terms of the potential for people to aesthetically enjoy wolves in the wild. This alternative would provide the highest level of support towards wolf conservation and recovery in Oregon (Section 4.3.1 and Appendix B). Therefore, non-consumptive users would benefit most from this alternative. Still, there are likely to be groups and individuals who would be opposed to any agency control of wolves, regardless of the beneficial role it plays in the conservation of wolves. The likelihood of getting to see wolves is probably very low currently due to the limited numbers of wolves in Oregon. The ability to directly enjoy wolves in the wild will probably be greatest for people who have knowledge of wolf behavior and habits and make the effort to visit sites with adequate habitat outside of damage management areas.

### **4.3.4 Effectiveness**

The effectiveness of the tools and techniques proposed under this alternative to manage depredation would be similar to the No Action alternative since either

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

way, non-lethal methods are in use when they are effective, and agency lethal control would take place using the same approach as provided by OWCMP (ODFW 2010a) and OAR 635-110 (as discussed in Sections 2.1, 4.1.4, and 4.2.4). However, the proposed action would likely be more efficient in resolving depredation than both the No Action and Non-lethal Methods Only alternatives in alleviating additional livestock damages. WS may be more efficient in responding to ODFW orders to remove depredating wolves as prescribed and needed to prevent further losses because it has agents in the field who already assist landowners with other wildlife damage conflicts. These agents may be more readily available to provide assistance perhaps sooner than if ODFW alone implemented lethal measures on depredating wolves. As ODFW stated in a March 28, 2012 letter to WS (Appendix B), without the assistance of WS as proposed in this EA, its own un-planned lethal depredation management efforts may be delayed due to other commitments and responsibilities, which would have the effect of increasing wolf depredation of livestock.

While it is likely that ultimately the same overall number of wolves would be removed under each of the alternatives, targeting and capture of depredating wolves would be expedited under the proposed action. Because chronically depredating wolves may continue depredating on livestock, fewer livestock losses would probably occur under this alternative.

### 4.4 Summary and Conclusions

This EA discusses approaches that WS could take to respond to requests by ODFW to assist with implementing portions of the 2010 OWCMP and OAR-635-110 (Appendix A), and to assist tribes acting under their sovereign tribal authority. The essential decision presented to WS, is not how to manage wolf damage to livestock, but whether or not to assist the State and tribes with specific actions dictated by the OWCMP or tribal management plans. This EA also evaluates a non-lethal only alternative which could be a viable alternative if funding and the request were there. The analysis in the EA shows that results of the No Action and Non-lethal only alternatives would be similar to the proposed action because ODFW and CTUIR would take necessary actions to remove chronically depredating wolves if WS did not. The primary difference between the alternatives is the probable increased efficacy of the proposed action in reducing livestock damage as compared with the no action and nonlethal methods only alternatives. In addition, the proposed action would enhance ODFW's ability to conserve wolves to the point of recovery. WS has no decision authority to remove wolves for ODFW or CTUIR, other than to either respond or not respond to their requests directing when, where, and which wolves should be removed. The methods used by ODFW to capture wolves include the same methods described in Chapter 3 which WS would use in providing requested assistance. OAR 635-110 and the OWCMP (ODFW 2010a) are very specific about the criteria which call for any lethal effects on wolves and if WS were to

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

participate, it would be following such direction by ODFW and similar direction from CTUIR under their sovereign tribal authority.

Table 2 presents the major conclusions drawn from the analysis in Chapter 4.

**Table 2. Summary and Conclusions**

<b>Issue</b>	<b>No Action (Alt. 1)</b>	<b>Non-lethal Only (Alt. 2)</b>	<b>Proposed IWDM (Alt 3)</b>
<b>Wolf population</b>	WS would have no effect on wolves. Tribes under their authority or ODFW would implement its OWCMP (ODFW 2010a) anyway without WS assistance. Agency removal of wolves will be limited to conservation and management criteria in OWCMP (ODFW 2010a). Wolves may continue to be protected outside of the NRM DPS in Oregon under the federal ESA, or they may be conserved and managed by ODFW. Wolf populations are expected to continue to increase in eastern Oregon and eventually statewide.	WS would have no direct effect on wolf populations. Cumulatively, this alternative would have the same effect as the No Action alternative since that alternative already requires the use of non-lethal methods. If non-lethal methods do not stop livestock losses, ODFW or CTUIR would remove chronic problem wolves.	WS would remove individual wolves at the request of ODFW according to the OWCMP (ODFW 2010a) or by CTUIR request and authority. The proposed action would have the same effect on wolves as the No Action alternative. WS would assist ODFW with both lethal and non-lethal aspects of OWCMP (ODFW 2010a) as well as assisting tribes. Removal of wolves would be extremely limited due to OWCMP and OAR 635-110 in terms of numbers and the population is expected to continue to expand from conservation through management phases both locally and statewide, as under the No Action Alternative.
<b>Non-target animals and human safety</b>	WS would have no effect on non-target animals. ODFW or tribes are not expected to have notable effects on non-target animals due to the skill and experience of its personnel. No human safety risks are expected due to the professionalism and expertise of personnel conducting management actions.	WS would likely capture few to no non-target animals in non-lethal capture devices. No T&E species or human risks are expected.	WS would have no notable negative effect on non-target animals. WS has precautionary measures built into the program to minimize risks to non-target animals and humans. No human safety risks are expected. WS would not be likely to adversely affect the federally threatened Canada lynx.
<b>Social and Aesthetic Perspectives</b>	Some people are opposed to lethal damage management strategies under any circumstances. Only chronic livestock killing wolves would be targeted for agency removal, which may increase acceptability of this alternative for some people. Humaneness is a concern for all and pain and suffering are minimized as	This alternative might be preferred by some groups and individuals, but would be opposed by others due to potential lower efficacy. However, since ODFW would remove chronic livestock killing wolves in the absence of WS, the end result would be	Similar to the No Action Alternative, some people are opposed to lethal damage management strategies. WS would only target confirmed chronic livestock killing wolves. Overall, the effects on humaneness and aesthetics would be the same as the No

## CHAPTER 4: ENVIRONMENTAL CONSEQUENCES

<p><b>Program Effectiveness</b></p>	<p>much as is practicable. Wolf removals may temporarily affect aesthetic enjoyment opportunities in or near damage sites, but overall wolves are expected to increase in number and range in Oregon. Implementation of the OWCMP (ODFW 2010a) is not likely to negatively affect the public’s aesthetic enjoyment of wolves since the population is expected to continue to grow</p> <p>WS would not participate. ODFW and tribes would use IWDM per OWCMP (ODFW 2010a) or tribal management plans. IWDM is the most effective strategy for reducing livestock losses. However, the effectiveness of the program is expected to be moderate (not as high as possible) based on the required threshold of losses that a producer must incur before lethal wolf damage methods can be used.</p>	<p>similar to the No Action Alternative. Because this alternative would not change the status quo of wolf management in Oregon, any humane and aesthetic effects would be the same as the No Action Alternative.</p> <p>Non-lethal methods have limited levels of efficacy and ODFW and tribes would use lethal methods similar to the No Action Alternative.</p>	<p>Action Alternative.</p> <p>WS may have improved efficacy in minimizing livestock losses as ODFW under the No Action and Non-lethal Only alternatives.</p>
-------------------------------------	--	---	--

## CHAPTER 5.0 LITERATURE CITED

- Andelt, W. F. 1987. Coyote predation. (Pages 128-140) in M. Nowack, J. A Baker, M. E. Obbard, and B. Malloch, editors. Wild furbearer management and conservation in North America. Ontario Trappers Association North Bay, Ontario, Canada.
- AVMA. 2007. AVMA guidelines on euthanasia (formerly report of the AVMA panel on euthanasia) June 2007. American Veterinary Medical Association, Schamburg, Illinois, USA.
- Ballard, W. B., L. A. Ayres, P. R. Krausman, D. J. Reed, and S. G. Fancy. 1997. Ecology of wolves in relation to a migratory caribou herd in northwest Alaska. *Wildlife Monographs* 135.
- Ballard, W. B., L. N. Carbyn, and D. W. Smith. 2003. Wolf interactions with non-prey. (Pages 259-271) in L. D. Mech and L. Boitani, editors. *Wolves: behavior, ecology, and conservation*. University of Chicago Press, Chicago, USA.
- Baker B. W., and E. F. Hill. 2003. Beaver: *Castor Canadensis*. (Pages 288-310) in G. A. Feldhamer, B. C. Thompson, and J. A. Chapman, editors. *Wild mammals of North America: biology, management, and conservation*. John Hopkins University Press, Baltimore, Maryland, USA.
- Bangs, E. E., and J. Shivik. 2001. Managing wolf conflict with livestock in the Northwestern United States. *Carnivore Damage Prevention News* 3: 2-5.
- Bangs, E. E., S. H. Fritts, J. A. Fontaine, D. W. Smith, K. M. Murphy, C. M. Mack, and C. C. Niemeyer. 1998. Status of gray wolf restoration in Montana, Idaho, and Wyoming. *Wildlife Society Bulletin* 26: 785-798.
- Bangs, E., M. Jimenez, C. Niemeyer, T. Meier, V. Asher, J. Fontaine, M. Collinge, L. Handegard, R. Krischke, D. Smith, and C. Mack. 2005. Livestock guarding dogs and wolves in the Northern Rocky Mountains of the United States. *Carnivore Damage Prevention News* 8: 32-39.
- Bangs, E. E., M. Jimenez, C. Niemeyer, J. Fontaine, M. Collinge, R. Krischke, L. Handegard, J. Shivik, C. Sime, S. Nadeau, C. Mack, D. Smith, V. Asher, and S. Stone. 2006. Non-lethal and lethal tools to manage wolf-livestock conflict in the northwestern United States. *Proceedings of the Vertebrate Pest Conference* 22: 7-16.
- Bangs, E., M. Jimenez, C. Niemeyer, J. Fontaine, C. Sime, S. Nadeau, and C. Mack. 2009. The art of wolf restoration in the northwestern United States: Where do we go now? (Pages 95-

- 114) *in* M. Musiano, L. Boitani, and P. Paquet, editors. A new era for wolves and people: wolf recovery, human attitudes, and policy. University of Calgary Press. Alberta, Canada.
- Beyer, H. 2006. Wolves, elk, and willow on Yellowstone's northern range. University of Alberta, Edmonton, Canada.
- Beyer, H. L., E. H. Merrill, N. Varley, and M. S. Boyce. 2007. Willow on Yellowstone's northern range: evidence for a trophic cascade? *Ecological Applications* 17: 1563–1571.
- Bishop, R. C. 1987. Economic values defined. (Pages 24-33) *in* D. J. Decker and G. R. Goff, editors. *Valuing wildlife: economic and social perspectives*. Westview Press, Boulder, Colorado, USA.
- Bjorge, R. R., and J. R. Gunson. 1985. Evaluation of wolf control to reduce cattle predation in Alberta. *Journal of Range Management* 38: 483-487.
- Boertje, R. D., and R. O. Stephenson. 1992. Effects of ungulate availability on wolf reproduction potential in Alaska. *Canadian Journal of Zoology* 70: 441-443.
- Boitani, L. 2003. Wolf conservation and recovery. (Pages 317-340) *in* L. D. Mech and L. Boitani, editors. *Wolves: behavior, ecology, and conservation*. The University of Chicago Press, Chicago, USA and London, England.
- Bradley, E. H. 2004. An evaluation of wolf-livestock conflicts and management in the northwestern United States. Thesis, University of Montana, Missoula, USA.
- Bradley, E. H., and D. H. Pletscher. 2005. Assessing factors related to wolf depredation of cattle in fenced pastures in Montana and Idaho. *Wildlife Society Bulletin* 33: 1256-1265.
- Brainerd, S. M., H. Andre'n, E. E. Bangs, E. Bradley, J. A. Fontaine, W. Hall, Y. Iliopulos, M. D. Jimenez, E. A. Jozwiak, O. Liberg, C. M. Mack, T. J. Meier, C. C. Niemeyer, H. C. Pedersen, H. K. Sand, R. N. Schultz, D. W. Smith, P. Wabakken, and A. P. Wydeven. 2008. The effects of breeder loss on wolves. *Journal of Wildlife Management* 72: 89-98.
- Breck, S. W., R. Williamson, C. Niemeyer, and J. A. Shivik. 2002. Non-lethal radio activated guard for deterring wolf predation in Idaho: summary and call for research. *Proceedings of the Vertebrate Pest Conference* 20: 223-226.
- Breck, S.W. and T. Meier. 2004. Managing wolf depredation in United States: past, present and future. *Sheep and Goat Research Journal* 9: 41-46.
- Bureau of Land Management (BLM). 2004. EMS TRANSMISSION Instruction Memorandum No. 2004-140 Revisions and Clarifications to H-8550-1, Interim Management Policy for Lands Under Wilderness Review, as it Relates to Wildlife Management.

- Cain, S., A. Kadlec, D. L. Allen, R. A. Cooley, M. C. Hornocker, A. S. Leopold, and F. H. Wagner. 1972. Predator control - 1971 report to the council on environmental quality and the department of the interior by the advisory committee on predator control. Council on Environmental Quality and United States Department of the Interior, Washington, DC, USA.
- Carroll, C., M. K. Phillips, C. A. Lopez-Gonzalez, and N. H. Schumaker. 2006. Defining recovery goals and strategies for endangered species: the wolf as a case study. *BioScience* 56: 25-37.
- Carroll C, M. K. Phillips, N. H. Schumaker, and D. W. Smith. 2003. Impacts of landscape change on wolf restoration success: Planning a reintroduction program using dynamic spatial models. *Conservation Biology* 17: 536-548.
- Cascadia Wildlands, et al. v. Dept. of Fish and Wildlife, et al., No. 149672 (Or. Ct. App. Nov. 15, 2011) order staying enforcement of rule pending judicial review
- Cochrane, J. F., R. G. Haight, and A. M. Starfield. 2003. Modeling for endangered-species recovery: gray wolves in the Western Great Lakes Region. *in* Dale, Virginia H., editor. *Ecological Modeling for Resource Management*. New York, NY: Springer-Verlag: 23-45  
<[http://www.ncrs.fs.fed.us/pubs/book/nc\\_2003\\_cochrane\\_001.pdf](http://www.ncrs.fs.fed.us/pubs/book/nc_2003_cochrane_001.pdf)>
- Collinge, M. 2008. Relative risks of predation on livestock posed by individual wolves, black bears, mountain lions, and coyotes in Idaho. *Proceedings of the Vertebrate Pest Conference* 23: 129-133. <<http://www.pinedaleonline.com/wolf/pdf/risksofpredation.pdf>>
- Cooper, L. 2001. Letter to the Lynx Steering Committee. Oregon Department of Fish and Wildlife.
- Coppinger, R., and L. Coppinger. 1996. Interactions between livestock guarding dogs and wolves. (Pages 523-526) *in* L. N. Carbyn, S. H. Fritts, D. R. Seip, editors. *Ecology and conservation of wolves in a changing world*. Canadian Circumpolar Institute, Occasional Publication No. 35, 642 pp.
- Crabtree, R. L, and J. W. Sheldon. 1999. Coyotes and canid coexistence in Yellowstone. (Pages 127-163) *in* T. W. Clark, A. P. Culee, S. C. Minta, and P. M. Karieva, editors. *Carnivores in ecosystems, the Yellowstone experience*. Yale University Press, New Haven, Connecticut, USA.
- Creel, S., and J. A. Winnie. 2005. Responses of elk herd size to fine-scale spatial and temporal variation in the risk of predation by wolves. *Animal Behavior* 69: 1181-1189.
- Creel, S., J. A. Winnie, Jr., D. Christianson, and S. Liley. 2008. Time and space in general models of antipredator response: tests with wolves and elk. *Animal Behaviour* 76: 1139-1146.

- Creel, S., J. Winnie, Jr., B. Maxwell, K. Hamlin, and M. Creel. 2005. Elk alter habitat selection as an antipredator response to wolves. *Ecology* 86: 3387-3397.
- Davis and Hibbits. 1999. *Telephone poll of 600 registered Oregon voters, focused on possible return of wolves to Oregon, conducted April 6–8, 1999*. Portland, Oregon: Davis and Hibbits, Inc.
- Davidson-Nelson, S. J., and T. M. Gehring. 2010. Testing fladry as a non-lethal management tool for wolves and coyotes in Michigan. *Human-Wildlife Interactions* 4: 87-94.
- Decker, D. J., and G. R. Goff. 1987. *Valuing wildlife: Economic and social perspectives*. Westview Press. Boulder, USA.
- Dorrance, M. J., and J. Bourne. 1980. An evaluation of anti-coyote electric fencing. *Journal of Range Management* 33: 385-387.
- Dorrance, M. J. 1982. Predation losses of cattle in Alberta. *Journal of Range Management* 35: 690-692.
- Fortin, D., H. L. Beyer, M. S. Boyce, D. W. Smith, T. Duchesne, and J. S. Mao. 2005. Wolves influence elk movements: Behavior shapes a trophic cascade in Yellowstone National Park. *Ecology* 86: 1320-1330.
- Fritts, S. H., W. J. Paul, and L. D. Mech. 1984. Movements of translocated wolves in Minnesota. *Journal of Wildlife Management* 48: 709-721.
- Fritts, S. H., W. J. Paul, and L. D. Mech. 1985. Can relocated wolves survive? *Wildlife Society Bulletin* 13: 459-463.
- Fritts, S. H., W. J. Paul, L. D. Mech, and D. P. Scott. 1992. Trends and management of wolf livestock conflicts in Minnesota. Resource Publication 181. United States Fish and Wildlife Service, Washington D.C., USA.
- Fritts, S. H., R. O. Stephenson, R. D. Hayes, and L. Boitani. 2003. Wolves and humans. (Pages 289-316) in L. D. Mech and L. Boitani, editors. *Wolves: behavior, ecology, and conservation*. The University of Chicago Press, Chicago, USA and London, England.
- Frost, J. R. 1985. *Living with the grizzly: perceptions of Mission Valley residents*. Environmental Studies. University of Montana, Missoula, MT.
- Fuller, T. K., L. D. Mech, and J. F. Cochrane. 2003. Wolf population dynamics. (Pages 161-191) in L. D. Mech and L. Boitani, editors. *Wolves: behavior, ecology, and conservation*. University of Chicago Press, Chicago, USA.

- Gude, J. A., B. Garrott, J.J. Borkowski, F. King. 2006. Prey risk allocation in a grazing ecosystem. *Ecological Applications* 16: 285-298.
- Gustavson, C. R., and L.K. Nicolaus. 1987. Taste aversion conditioning in wolves, coyotes, and other canids: retrospect and prospect. (Pages 169-203) *in* H. Frank, editor. *Man and wolf: advances, issues, and problems in captive wolf research*. W. Junk, Boston, Massachusetts, USA.
- Haight, R. G., L. E. Travis, K. Nimerfro, and L.D. Mech. 2002. Computer simulation of wolf removal strategies for animal damage control. *Wildlife Society Bulletin* 30: 844-852.
- Hansen, A., L. Baril, R. Renkin, T. McvEneaney, and D. W. Smith. 2005. Report to the Yellowstone centre for resources. Yellowstone National Park, Wyoming, USA.
- Hebblewhite, M., and D. W. Smith. 2005. Wolf community ecology: Ecosystem effects of recovering wolves in Banff and Yellowstone national parks. (Pages 69-120) *in* M. Musiani, L. Boitaini, and P. C. Paguet, editors. *The world of wolves: new perspectives on ecology, behavior, and policy*. University of Calgary Press, Calgary, Alberta, Canada.
- Holt, R. D., and M. Roy. 2007. Predation can increase the prevalence of infectious disease. *American Naturalist* 169: 690-699.
- Howery, L. D. and T. J. DeLiberto. 2004. Indirect effects of carnivores on livestock foraging behavior and production. *Sheep and Goat Research Journal* Volume 19.  
<[http://www.sheepusa.org/index.phtml?page=site/news\\_details&nav\\_id=30836f603c6643459e70ae92e558dd7e&nav\\_parent\\_id=601e0a31bbf6a0ef56f1f0591aa0dc78&volume=Volume%2019,%202004%20-Special%20Edition:%20Predation](http://www.sheepusa.org/index.phtml?page=site/news_details&nav_id=30836f603c6643459e70ae92e558dd7e&nav_parent_id=601e0a31bbf6a0ef56f1f0591aa0dc78&volume=Volume%2019,%202004%20-Special%20Edition:%20Predation)>
- IDFG. 2008. Idaho Wolf Population Management Plan 2008-2012. Idaho Department of Fish and Game, Boise, USA.  
<<http://fishandgame.idaho.gov/cms/wildlife/wolves/manage/PopManagePlan.pdf>>
- Idaho Department of Fish and Game and Nez Perce Tribe. 2012. *2011 Idaho wolf monitoring progress report*. Idaho Department of Fish and Game, 600 South Walnut, Boise, Idaho; Nez Perce Tribe Wolf Recovery Project, P.O. Box 365, Lapwai, Idaho. 94 pp.
- Julien, T. J., S. M. Vantassel, S. R. Groepper, and S. E. Hyngstrom. 2010. Euthanasia methods in field settings for wildlife damage management. *Human-Wildlife Interactions* 42: 158-164.
- Kauffman, M. J., N. Varley, D. W. Smith, D. R. Stahler, D. R. MacNulty, and M. S. Boyce. 2007. Landscape heterogeneity shapes predation in a newly restored predator-prey system. *Ecology Letters* 10: 690-700.

- Kauffman, M.J., J. F. Brodie, and E. S. Jules. 2010. Are wolves saving Yellowstone's aspen? A landscape-level test of a behaviorally mediated trophic cascade. *Ecology* 91: 2742–2755.
- Karlsson, J. and O. Johansson. 2009. Predictability of repeated carnivore attacks on livestock favours reactive use of mitigation measures. *Journal of Applied Ecology* 47: 166-171.
- Keith, L. B. 1983. Population dynamics of wolves. (Pages 66-77) in L. N. Carbyn, editor. *Wolves in Canada and Alaska: their status, biology, and management*. Canadian Wildlife Service Report Series 45, Ottawa, Canada.
- Kellert, S. R. 1999. The public and the wolf in Minnesota. A report to the International Wolf Center, Minneapolis.  
[http://www.wolf.org/wolves/learn/intermed/inter\\_human/survey\\_shows.asp](http://www.wolf.org/wolves/learn/intermed/inter_human/survey_shows.asp)
- Klenzendorf, S. A. 1997. *Management of Brown Bears (Ursus arctos) in Europe*. Unpublished Thesis, Fisheries and Wildlife Science, Virginia Polytechnic Institute and State University, Blacksburg, VA.
- Kluever, B. M., S. W. Breck, L. D. Howery, P. R. Krausman, and D. L. Bergman. 2008. Vigilance in cattle: the influence of predation, social interactions and environmental factors. *Rangeland Ecology and Management* 61: 321-328.
- Kortello, D., E. Hurd, and L. Murray. 2007. Interactions between cougars (*Puma concolor*) and gray wolves (*Canis lupus*) in Banff National Park, Alberta. *Ecoscience* 14: 214-222.
- Kruuk, H. 2002 *Hunter and Hunted: Relationship between Carnivores and People*. Cambridge University Press, Cambridge. Leighton, FA (2002)
- Laundre, J. W., L. Hernandez, and K. B. Altendorf. 2001. Wolves, elk, and bison: re-establishing the ‘landscape of fear’ in Yellowstone National Park, USA. *Canadian Journal of Zoology* 79: 1401–1409.
- Lehmkuhler, J., G. Palmquist, D. Ruid, R. Willging, and A. Wydeven. 2007. Effects of wolves and other predators on farms in Wisconsin: beyond verified losses. Pub-ER-658 2007, Wisconsin Department of Natural Resources, Madison, USA. [http://dnr.wi.gov/org/land/er/publications/pdfs/wolf\\_impact.pdf](http://dnr.wi.gov/org/land/er/publications/pdfs/wolf_impact.pdf)
- Liley, S., and S. Creel. 2007. What best explains vigilance in elk: characteristics of prey, predators, or the environment? *Behavioral Ecology* 19: 245–254.
- Lima, S. L., and P. A. Bednekoff. 1999. Temporal variation in danger drives antipredator behavior: the predation risk allocation hypothesis. *American Naturalist* 153: 649–659.
- Linhart, S. B. 1984. Managing coyote damage problems with non-lethal techniques: recent advancements in research. *Proceedings of the Eastern Wildlife Damage Control Conference* 1: 105-118.

- Linnell, J. D. C., M. E. Smith, J. Odden, J. E. Swenson, and P. Kaczensky. 1996. Carnivore and sheep farming in Norway. 4. Strategies for the reduction of carnivore- livestock conflicts: a review. NINA (Norsk Institute for Naturforskning) Oppdragsmelding 443: 1-118.
- Linnell, J. D. C., R. Anderson, Z. Andersone, L. Balciauskas, J. C. Blanco, L. Boitani, S. Brainerd, U. Breitenmoser, I. Kojloa, O. Liberg, J. Loe, H. Okarma, H. C. Pedersen, C. Promberger, H. Sand, E. J. Valdmann, and P. Wabakken. 2002. The fear of wolves: a review of wolf attacks on humans. NINA (Norsk Institute for Naturforskning) Oppdragsmelding 731: 1-65.
- Lopez, B. H. 1978. Of wolves and men. Charles Scribner's and Sons, New York, New York, USA.
- Mack, J. A., W. G. Brewster, and S. H. Fritts. 1992. A review of wolf depredation on livestock and implications for the Yellowstone area. (Pages 3-20) in J. D. Varley and W G. Brewster, editors. Wolves for Yellowstone? A report to the United States Congress. Volume IV Research and Analysis. National Park Service, Yellowstone National Park, Mammoth Hot Springs, Wyoming, USA.
- MacNulty, D. R., D. W. Smith, J. A. Vucetich, L. D. Mech, D. R. Stahler, and C. Packer. 2009a. Predatory senescence in ageing wolves. Ecology Letters 12: 1347-1356.
- MacNulty, D. R. D. W. Smith, L. D. Mech, and L. E. Eberly. 2009b. Body size and predatory performance in wolves: is bigger better? Journal of Animal Ecology 78: 532-539
- Mao, J. S., M. S. Boyce, D. W. Smith, F. J. Singer, D. J. Vales, J. M. Vore, and E. H. Merrill. 2005. Habitat selection by elk before and after wolf reintroduction in Yellowstone National Park. Journal of Wildlife Management 69: 1691-1707.
- Mattson, D. J. 1997. Use of ungulates by Yellowstone grizzly bears *Ursus arctos*. Biological Conservation 81: 161-177.
- McKelvey, K.S., and K. B. Aubrey. 2001. Letter to the Lynx Steering Committee. USDA Forest Service, Rocky Mountain Research Station. 4 pp.
- McNay, M. E. 2002. Wolf-human interactions in Alaska and Canada: a review of the case history. Wildlife Society Bulletin 30: 831-843.
- Mech, L. D. 1970. The wolf: the ecology and behavior of an endangered species. University of Minnesota Press, Minneapolis, USA.
- Mech, L. D. 1995. The challenge and opportunity of recovering wolf populations. Conservation Biology 9: 270-278.

- Mech, L. D. 2001. Management of Minnesota's recovering wolf population. *Wildlife Society Bulletin* 29: 70-77.
- Mech, L. D. 2012. Is science in danger of sanctifying the wolf? *Biological Conservation* 150: 143-149.
- Mech, L. D., and L. Boitani. 2003. Wolf social ecology. (Pages 1–34) *in* L. D. Mech and L. Boitani, editors. *Wolves: behavior, ecology and conservation*. University of Chicago Press, Chicago, Illinois, USA.
- Mech, L. D., L. G. Adams, T. J. Meier, J. W., Burch, and B. W. Dale. 1998. The wolves of Denali. University of Minnesota Press. 227pp.
- Mech, L. D., S. H. Fritts, and M. E. Nelson. 1996. Wolf management in the 21st century: from public input to sterilization. *Journal of Wildlife Research* 1: 195-198.  
<http://www.npwrc.usgs.gov/resource/mammals/wolfman/index.htm> (Version 02MAR2000).>
- Mech, L. D., E. K. Harper, T. J. Meier, and W. J. Paul. 2000. Assessing factors that may predispose Minnesota farms to wolf depredations on cattle. *Wildlife Society Bulletin* 28: 630-635.
- Michigan Department of Natural Resources (MDNR). 2008. Michigan Wolf Management Plan. Wildlife Division Report No. 3484. July 10, 2008, Lansing, Michigan. 96 pp.
- Muhly, T. B., and M. Musiani. 2009. Livestock depredation by wolves and the ranching economy in the Northwestern U. S. *Journal of Ecological Economics* 10: 1016.
- Muhly, T. B., M. Alexander, M. S. Boyce, R. Creasey, M. Hebblewhite, D. Paton, J. A. Pitt, and M. Musiani. 2010. Differential risk effects of wolves on wild versus domestic prey have consequences for conservation. *Oikos* 119: 1243-1254.
- Murphy, K. M. 1998. The ecology of the cougar (*Puma concolor*) in the northern Yellowstone ecosystem: interactions with prey, bears, and humans. Dissertation, University of Idaho, Moscow, USA.
- Musiani, M., C. Mamo, L. Boitani, C. Callaghan, C. Cormack Gates, L. Mattei, E. Visalberghi, S. Breck, and G. Volpi. 2003. Wolf depredation trends and the use of fladry barriers to protect livestock in western North America. *Conservation Biology* 17: 1538-1547.
- Musiani, M., Muhly, T., Callaghan, C., Gates, C.C., Smith, M., Stone, S. and Tosoni, E. 2004. Recovery, conservation, conflicts and legal status of wolves in western North America. Pages 51-75 in N. Fascione, A. Delach and M. Smith, (eds.). *Predators and People: from conflict to conservation*. Island Press, Washington, D.C., USA.

- Nass, R. D., and J. Theade. 1988. Electric fences for reducing sheep losses top predators. *Journal of Range Management* 412: 251-252.
- Naughton-Treves, L., R. A Grossberg, and A. Treves. 2003. Paying for tolerance: rural citizens' attitudes toward wolf depredation and compensation. *Conservation Biology* 17: 1500-1511.
- Naughton, L., A. Treves, R. Grossberg, and D. Wilcove. 2005. Public opinion survey: wolf management in Wisconsin.  
<[http://www.geography.wisc.edu/livingwithwolves/public\\_reports.htm](http://www.geography.wisc.edu/livingwithwolves/public_reports.htm)>
- Niemeyer, C. C., E. E. Bangs, S. H. Fritts, J. A. Fontaine, M. D. Jimenez, and W. G. Brewster. 1994. Wolf depredation management in relation to wolf recovery. *Proceedings of the Vertebrate Pest Conference* 16: 57-60.
- Oakleaf, J. K., C. Mack, and D. L. Murray. 2003. Effects of wolves on livestock calf survival and movements in central Idaho. *Journal of Wildlife Management* 67: 299-306.
- Oakleaf, J. K., D. L. Murray, J. R. Oakleaf, E. E. Bangs, C. M. Mack, D. W. Smith, J. A. Fontaine, M. D. Jimenez, T. J. Meier, and C. C. Niemeyer. 2006. Habitat selection by recolonizing wolves in the Northern Rocky Mountains of the United States. *Journal of Wildlife Management* 70: 554-565.
- Olson, J. F., and R. Tischaefer. 2004. Cable restraints in Wisconsin: a guide to responsible use. Wisconsin Department of Natural Resources, Madison, USA and Wisconsin Trappers Association.
- Oregon Department of Fish and Wildlife (ODFW) 2010a. Oregon Wolf Conservation and Management Plan, 2005 and Updated 2010. Oregon Department of Fish and Wildlife. [http://www.dfw.state.or.us/Wolves/docs/Oregon\\_Wolf\\_Conservation\\_and\\_Management\\_Plan\\_2010.pdf](http://www.dfw.state.or.us/Wolves/docs/Oregon_Wolf_Conservation_and_Management_Plan_2010.pdf)
- Oregon Department of Fish and Wildlife (ODFW) 2010b. Oregon Wolf Conservation and Management Plan – 2010 Evaluation, Staff Summary of Policy Issues Raised by Stakeholders. August 6, 2010  
<http://library.state.or.us/repository/2010/201008301515121/index.pdf>
- Oregon Department of Fish and Wildlife (ODFW). 2012a. Oregon depredation list for WS. A report provided to WS by Russ Morgan, Wolf Coordinator, ODFW, La Grande, Oregon.
- Oregon Department of Fish and Wildlife (ODFW). 2012b. Oregon Wolf Conservation and Management Plan. 2011 Annual Report. Oregon Department of Fish and Wildlife. La Grande, OR 97850.  
[http://www.dfw.state.or.us/wolves/docs/oregon\\_wolf\\_program/2011\\_Wolf\\_Conservation\\_Management\\_Plan\\_Annual\\_Report.pdf](http://www.dfw.state.or.us/wolves/docs/oregon_wolf_program/2011_Wolf_Conservation_Management_Plan_Annual_Report.pdf)

- Packer, C., R. Holt, P. J. Hudson, K. D. Lafferty, and A. P. Dobson. 2003. Keeping the herds healthy and alert: implications of predator control for infectious disease. *Ecology Letters* 6:9, 797-802.
- Paul, W. and P. Gipson. 1994. Wolves. (Pages c-123 to c-129) in S. E. Hygnstrom, R. Timm and G. E. Larson, editors. *Prevention and control of wildlife damage*. University of Nebraska Cooperative Extensive Service, University of Nebraska, Lincoln, USA.
- Peek, J. M., D. E. Brown, S. R. Kellert, L. D. Mech, J. H. Shaw, and V. Van Ballenberghe. 1991. Restoration of wolves in North America. The Wildlife Society, Technical Advisory Committee on Wolf Reintroduction (Ad Hoc), Bethesda, Maryland. Technical Review 91-1.
- Peterson, R.O., J. D. Woolington, and T. N. Bailey. 1984. Wolves of the Kenai Peninsula, Alaska. *Wildlife Monographs* 88.
- Pletscher, D. H., R. R. Ream, D. K. Boyd, M. W. Fairchild, and K. E. Kunkel. 1997. Population Dynamics of a Recolonizing Wolf Population. *The Journal of Wildlife Management* 61: 459-465.
- Reiter DK, Brunson MW, Schmidt RH. 1999. Public attitudes toward wildlife damage management and policy. *Wildlife Society Bulletin* 27(3):746-758.
- Ripple, W. J., and R. L. Beschta. 2003. Wolf reintroduction, predation risk, and cottonwood recovery in Yellowstone National Park. *Forest Ecology and Management* 184: 299-313.
- Ripple, W. J., and P. L. Beschta. 2004. Wolves, elk, willows and trophic cascade in the upper Gallatin Range of southwestern Montana, USA. *Forest Ecology and Management* 200: 161-181.
- Ripple W. J., and R. L. Beschta. 2006. Linking wolves to willows via risk sensitive foraging by ungulates in the northern Yellowstone ecosystem. *Forest Ecology and Management* 230: 96-106.
- Ripple, W. J., E. J. Larsen, R. A. Renkin, and D. W. Smith. 2001. Trophic cascades among wolves, elk and aspen on Yellowstone National Park's northern range. *Biology Conservation* 102: 227-234.
- Robbins, J. 2007. Is the West losing its wild? *Conde' Nast Traveler*. December 2007: 107-120.
- Rutledge L. Y., B. R. Patterson, K. J. Mills, K. M. Loveless, D. L. Murray, and B. N. White. 2010. Protection from harvesting restores the natural social structure of eastern wolf packs. *Biological Conservation* 143: 332-339.
- Ruth, T. K. 2004. Ghost of the Rockies: the Yellowstone cougar project. *Yellowstone Science* 12: 13-24.

- Schanning, K., M. Demashke, L. Kret, B. Sanford, and J. Vazques. 2003. State of the wolf project: Wisconsin wolf survey 2003. Northland College, Sigurd Olson Environmental Institute, Ashland, Wisconsin, USA.
- Schmitz, O. J., K. Vlastimil, and O. Ofer. 2004. Trophic cascades: the primacy of trait-mediated indirect interactions. *Ecology Letters* 7: 153-163.
- Schmitz, O. J. 2005. Behavior of predators and prey and links with population level processes. (Pages 256-278) *in* P. Barbosa and I. Castellanos, editors. *Ecology of predator-prey interactions*. Oxford University Press, Oxford, UK.
- Schultz, R. N., K. W. Jonas, L. H. Skudt, and A. P. Wydeven. 2005. Experimental use of dog-training shock collars to deter depredation by gray wolves. *Wildlife Society Bulletin* 33: 142-148.
- Shelton, M. 2004. Predation and Livestock Production – Perspective and Overview. *Sheep and Goat Research Journal* Volume 19. [http://www.sheepusa.org/index.phtml?page=site/news\\_details&nav\\_id=4e92bbbcf5184ed243442d8fa0a7c677&nav\\_parent\\_id=601e0a31bbf6a0ef56f1f0591aa0dc78&volume=Volume%2019,%202004%20-Special%20Edition:%20Predation](http://www.sheepusa.org/index.phtml?page=site/news_details&nav_id=4e92bbbcf5184ed243442d8fa0a7c677&nav_parent_id=601e0a31bbf6a0ef56f1f0591aa0dc78&volume=Volume%2019,%202004%20-Special%20Edition:%20Predation)
- Shivik, J. A. 2004. Non-lethal alternatives for predation management. *Sheep and Goat Research Journal* 19: 64-71.
- Shivik, J. A., and D. J. Martin. 2001. Aversive and disruptive stimulus applications for managing predation. *Proceedings of the Wildlife Damage Management Conference* 9: 111-119.
- Shivik, J. A., V. Asher, L. Bradley, K. Kunkel, M. Phillips, S. W. Breck, and E. E. Bangs. 2002. Electronic aversive conditioning for managing wolf depredation. *Proceedings of the Vertebrate Pest Conference* 20: 227-231.
- Shivik, J. A., A. Treves, and P. Callahan. 2003. Non-lethal techniques for managing predation: primary and secondary repellents. *Conservation Biology* 17: 1531-1538.
- Sillero-Zubiri, C. & Laurenson, M.K. (2001) Interactions between carnivores and local communities: conflict or co-existence? *In* *Carnivore Conservation* (Eds J.L. Gittleman, S.M. Funk, D.W. Macdonald & R.K. Wayne), pp. 282–312. Cambridge University Press, Cambridge.
- Slate, D. A., R. Owens, G. Connely, and G. Simmons. 1992. Decision making for wildlife damage management. *Transactions of the North American Wildlife and Natural Resource Conference* 57: 51-62.
- Slovic, P. 1987. Perception of risk. *Science, New Series*, 236 (4799): 280-285.

- Smith, D.W., and D.S. Guernsey. 2002. Yellowstone Wolf Project: Annual Report, 2001. National Park Service, Yellowstone Center for Resources, Yellowstone National Park, Wyoming, YCR-NR-2002-04.
- Smith, R. H., D. J. Neff, and N. G. Woolsey. 1986. Pronghorn response to coyote control - a benefit:cost analysis. *Wildlife Society Bulletin* 14: 226-231.
- Thiel, R. P. 1993. *The timber wolf in Wisconsin : the death and life of a majestic predator.* University of Wisconsin Press, Madison, Wisconsin, USA.
- Thompson, T., and Gasson, W., 1991, Attitudes of Wyoming residents on wolf reintroduction and related issues. Wyoming Game and Fish Department, Cheyenne, 43 pp.
- Treves, A. 2009. Hunting for large carnivore conservation. *Journal of Applied Ecology* 46: 1350-1356.
- Treves, A., R. R. Jurewicz, L. Naughton-Treves, R. A. Rose, R. C. Willging, and A. P. Wydeven. 2002. Wolf depredation on domestic animals in Wisconsin 1976-2000. *Wildlife Society Bulletin* 30: 231-241.
- Urbigit, C. and J. Urbigit. 2010. A review: The use of livestock protection dogs in association with large carnivores in the Rocky Mountains. *Sheep and Goat Research Journal* 25: 1-8.
- USDA. 1997, revised. Animal damage control program, final environmental impact statement. United States Department of Agriculture, Animal and Plant Health Inspection Service, Animal Damage Control [Wildlife Services], Operational Support Staff, Riverdale, Maryland, USA.
- USDA, 2006. Final Environmental Assessment for the Management of Wolf Conflicts and Depredating Wolves in Michigan. United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, Okemos, Michigan, USA.
- USDA, 2008. Final Environmental Assessment for the Management of Wolf Conflicts and Depredating Wolves in Wisconsin. United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, Sun Prairie, Wisconsin, USA.
- USDA. 2010. Idaho Wildlife Services wolf activity report fiscal year 2009. United States Department of Agriculture, Animal and Plant Health Inspection Service, Wildlife Services, Boise, Idaho, USA.
- USDA. 2011a. Environmental Assessment, Gray Wolf Damage Management in Idaho for Protection of Livestock and other Domestic Animals, Wild Ungulates, and Human Safety. USDA APHIS-WS, Boise, Idaho.
- USDA. 2011b. Final Environmental Assessment, Predator Damage Management in Nevada. USDA APHIS WS, Reno, Nevada.

- U.S. Fish and Wildlife Service (USFWS). 1987. Northern Rocky Mountain Wolf Recovery Plan. U.S. Fish and Wildlife Service, Denver, Colorado, 119pp.
- USFWS. 1994. The reintroduction of gray wolves to Yellowstone National Park and central Idaho: Final environmental impact statement. U.S. Fish and Wildlife Service, Denver, Colorado, USA.
- USFWS. 2003. Notice of Remanded Determination of Status for the Contiguous United States Distinct Population Segment of Canada Lynx. *Federal Register*. 68:40076.
- USFWS. 2008. Environmental Assessment and Finding of No Significant Impact for Proposed Revision Of Special Regulation for the Reintroduction of Gray Wolves Into the Central Idaho and Yellowstone Areas. U.S. Fish and Wildlife Service, Washington D.C., USA. [http://www.fws.gov/mountain-prairie/species/mammals/wolf/EA\\_01182008/Wolf\\_10j\\_FONSI\\_EA\\_011608.pdf](http://www.fws.gov/mountain-prairie/species/mammals/wolf/EA_01182008/Wolf_10j_FONSI_EA_011608.pdf)
- USFWS. 2009. Wyoming gray wolf recovery status report for the week of May 11-15, 2009. U.S. Fish and Wildlife Service, Washington D.C., USA. <http://www.fws.gov/mountain-prairie/species/mammals/wolf/wyomingStatus09/05152009.html>
- USFWS. 2012. Lower 48–State and Mexico Gray Wolf Listing (*Canis lupus*), as Revised. 5-Year Review: Summary and Evaluation. U. S. Fish and Wildlife Service, Washington Office, Arlington Virginia.
- USFWS, Idaho Department of Fish and Game, Montana Fish, Wildlife & Parks, Nez Perce Tribe, National Park Service, Blackfeet Nation, Confederated Salish and Kootenai Tribes, Wind River Tribes, Washington Department of Fish and Wildlife, Oregon Department of Fish and Wildlife, Utah Department of Natural Resources, and USDA Wildlife Services. 2012. Northern Rocky Mountain Wolf Recovery Program 2011 Interagency Annual Report. M.D. Jimenez and S.A. Becker, eds. USFWS, Ecological Services, 585 Shepard Way, Helena, Montana, 59601.
- USFWS, Nez Perce Tribe, National Park Service, MFWP, IDFG, and USDA WS. 2002. Rocky Mountain wolf recovery 2001 annual report. U.S. Fish and Wildlife Service, Helena, Montana, USA <http://www.fws.gov/mountain-prairie/species/mammals/wolf/annualrpt01/2001report.htm>
- USFWS, Nez Perce Tribe, National Park Service, and USDA WS. 2003. Rocky Mountain wolf recovery 2002 annual report. T. Meier, editor. U.S. Fish and Wildlife Service, Ecological Services, Helena, Montana, USA. <http://www.fws.gov/mountain-prairie/species/mammals/wolf/annualrpt02/2002report.pdf>
- USFWS, Nez Perce Tribe, National Park Service, MFWP, IDFG, and USDA WS. 2005. Rocky Mountain wolf recovery 2004 annual report. D. Boyd, editor. U.S. Fish and Wildlife Service, Ecological Services, Helena, Montana, USA. <http://www.fws.gov/mountain-prairie/species/mammals/wolf/annualrpt04/2004%20Annual%20Report%20total%20then%20acc.pdf>

- USFWS, Nez Perce Tribe, National Park Service, MFWP, IDFG, and USDA WS. 2007. Rocky Mountain wolf recovery 2006 annual report. C. A. Sime and E. E. Bangs, editors. USFWS, Ecological Services, Helena, Montana, USA.
- USFWS, Nez Perce Tribe, National Park Service, MFWP, IDFG, and USDA WS. 2009. Rocky Mountain wolf recovery 2008 interagency annual report. C. A. Sime and E. E. Bangs, editors. U.S. Fish and Wildlife Service, Ecological Services, Helena, Montana, USA. [http://www.fws.gov/mountain-prairie/species/mammals/wolf/annualrpt08/FINAL\\_2008\\_USFWS\\_Recovery\\_Program\\_Update\\_3-17-09.pdf](http://www.fws.gov/mountain-prairie/species/mammals/wolf/annualrpt08/FINAL_2008_USFWS_Recovery_Program_Update_3-17-09.pdf)
- USFWS, Nez Perce Tribe, National Park Service, MFWP, IDFG, and USDA WS. 2010. Rocky Mountain wolf recovery 2009 annual report. C. A. Sime and E. E. Bangs, editors. U.S. Fish and Wildlife Service, Ecological Services, Helena, Montana, USA. [http://www.fws.gov/mountain-prairie/species/mammals/wolf/annualrpt09/FINAL\\_AR\\_FWS\\_2009\\_Recovery\\_Program\\_Update.pdf](http://www.fws.gov/mountain-prairie/species/mammals/wolf/annualrpt09/FINAL_AR_FWS_2009_Recovery_Program_Update.pdf)
- U.S. Fish and Wildlife Service, Idaho Department of Fish and Game, Montana Fish, Wildlife & Parks, Nez Perce Tribe, National Park Service, Blackfeet Nation, Confederated Salish and Kootenai Tribes, Wind River Tribes, Washington Department of Fish and Wildlife, Oregon Department of Fish and Wildlife, Utah Department of Natural Resources, and USDA Wildlife Services. 2012. Northern Rocky Mountain Wolf Recovery Program 2011.
- USFWS, ODFW, WS. 2011. Federal/State Coordination Strategy for Implementation of Oregon's Wolf Plan. USFWS, Portland, OR, 14pp.
- Verts, B.J. and L.N. Carraway. 1998. Land mammals of Oregon. University of California Press. Berkeley.
- vonHoldt, B. M., D. R. Stahler, D. W. Smith, D. A. Earl, J. P. Pollinger, R. K. Wayne. 2008. The genealogy and genetic viability of reintroduced Yellowstone grey wolves. *Molecular Ecology* 17: 252-274.
- vonHoldt, B. M., D. R. Stahler, E. E. Bangs, D. W. Smith, M. D. Jimenez, C. M. Mack, C. C. Niemeyer, J. P. Pollinger, and R. K. Wayne. 2010. A novel assessment of population structure and gene flow in grey wolf populations of the Northern Rocky Mountains of the United States. *Molecular Ecology* 19: 4412-4427.
- Wagner, K. K., Schmidt, R. H. & Conover, M. R. 1997. Compensation programs for wildlife damage in North America. *Wildlife Society Bulletin* 25: 312-319.
- Wayne, R. K., N. Lehman, D. Girman, P. J. P. Gogan, D. A. Gilbert, K. Hansen, R. O. Peterson, U. S. Seal, A. Eisenhawer, L. D. Mech and R. J. Krumenaker. 1991. Conservation Genetics of the Endangered Isle Royale Gray Wolf. *Conservation Biology* 5: 41-51.

- Wilmers, C. C., and W. M. Getz. 2005. Gray wolves as climate change buffers in Yellowstone. *PLoS Biol.* 3: 0571-0576.
- Wilmers, C. C., D. R. Stahler, R. L. Crabtree, D. W. Smith, and W. M. Getz. 2003a. Resource dispersion and consumer dominance: Scavenging at wolf- and hunter-killed carcasses in Greater Yellowstone, USA. *Ecol Lett* 6: 996-1003.
- Winnie, J., Jr., and Scott Creel. 2007. Sex-specific behavioural responses of elk to spatial and temporal variation in the threat of wolf predation. *Animal Behaviour* 73: 215-225.
- Wolstenholme, R. C. 1996. Attitudes of residents toward wolves in a rural community in northwestern Montana. *Environmental Studies*. University of Montana, Missoula, MT

## CHAPTER 6.0 AGENCIES AND PERSONS CONSULTED

### **Preparers**

Kevin Christensen, Assistant State Director  
U.S. Dept. of Agriculture, Animal and Plant Health Inspection Service  
Wildlife Services Program  
Portland, Oregon

Shannon Hebert, Environmental Coordinator  
U.S. Dept. of Agriculture, Animal and Plant Health Inspection Service  
Wildlife Services Program  
Portland, Oregon

David Hayes, Environmental Coordinator  
U.S. Dept. of Agriculture, Animal and Plant Health Inspection Service  
Wildlife Services Program  
Billings, Montana

David Williams, State Director  
U.S. Dept. of Agriculture, Animal and Plant Health Inspection Service  
Wildlife Services Program  
Portland, Oregon

Gary Littauer, Assistant Regional Director  
U.S. Dept. of Agriculture, Animal and Plant Health Inspection Service  
Wildlife Services Program  
Fort Collins, Colorado

### **Agencies and Persons Consulted**

Ron Anglin, Wildlife Division Administrator  
Oregon Department of Fish and Wildlife  
Salem, Oregon

Tim Hiller, Carnivore/Furbearer Coordinator  
Oregon Department of Fish and Wildlife  
Salem, Oregon

Russ Morgan, Wolf Management Biologist  
Oregon Department of Fish and Wildlife  
La Grande, Oregon

Bruce Eddy, Northwest Regional Supervisor  
Oregon Department of Fish and Wildlife  
La Grande, Oregon

Dr. Don Hansen, State Veterinarian  
Oregon Department of Agriculture  
Salem, Oregon

Gary Miller, Field Supervisor  
U.S. Dept. of Interior, Fish and Wildlife Service  
La Grande, Oregon

John Stevenson, Wolf Coordinator  
U.S. Dept. of Interior, Fish and Wildlife Service  
Bend, Oregon

Todd Thompson, Wildlife Biologist  
Bureau of Land Management  
Portland, Oregon

Margaret Langlas, Planning and Environmental Coordinator  
Bureau of Land Management  
Portland, Oregon

Kent Connaughton, Regional Forester  
U.S. Forest Service  
Portland, Oregon

Jill Dufour, Regional Environmental Coordinator Pacific Northwest Region  
U. S. Forest Service  
Portland, Oregon

Carl Scheeler, Wildlife Program Manager  
Confederate Tribes of the Umatilla Indian Reservation  
Pendleton, Oregon

Jason Kesling, Natural Resources Director  
Burns Paiute Tribe  
Burns, Oregon

David Speten, Natural Resources  
The Klamath Tribes  
Klamath, Oregon

Doug Calvin, Natural Resources  
The Confederated Tribes of Warm Springs

Alton Dunaway, National Environmental Manager  
U.S. Dept. of Agriculture, Animal and Plant Health Inspection Service  
Wildlife Services Program  
Riverdale, Maryland

Todd Grimm, State Director  
U.S. Dept. of Agriculture, Animal and Plant Health Inspection Service  
Wildlife Services Program  
Boise, ID

Michael Burrell, Supervisory Wildlife Biologist  
U.S. Dept. of Agriculture, Animal and Plant Health Inspection Service  
Wildlife Services Program  
Roseburg, Oregon

Patrick Smith, Supervisory Wildlife Biologist  
U.S. Dept. of Agriculture, Animal and Plant Health Inspection Service  
Wildlife Services Program  
La Grande, Oregon

James Booth, Esq. Attorney Advisor,  
APHIS Office of General Council,  
Washington, D.C.

Annalisa Jabaily  
Office of General Council  
U.S. Dept. of Agriculture, Animal and Plant Health Inspection Service  
Washington, D.C



## Appendix A: OAR 635-110

The Oregon Administrative Rules filed through February 15, 2012

DEPARTMENT OF FISH AND WILDLIFE  
DIVISION 110  
OREGON WOLF CONSERVATION AND MANAGEMENT PLAN

### 635-110-0000

#### Wolf Conservation and Management Plan

The document entitled "Oregon Wolf Conservation and Management Plan" dated October 2010 is incorporated here by reference as administrative rule. (This incorporation by reference includes the body of the Plan plus its Appendix A. Other appendices are excluded) Copies may be obtained at the Salem headquarters office of the Oregon Department of Fish and Wildlife, 3406 Cherry Avenue NE, Salem, OR 97303. This document includes program direction, objectives and strategies to fulfill management, research, and habitat needs. It is also intended as an informational document to assist resource management agencies with their wildlife program. As of October 1, 2010, those portions of the plan which authorize harassment or take of wolves are pre-empted by the endangered status of the gray wolf under the federal Endangered Species Act. Once federal protections are reduced to a level below that of Oregon law, those portions of the plan will govern harassment and take of wolves in Oregon.

Stat. Auth.: ORS 496.012, 496.138, 496.146 & 496.162

Stats. Implemented: ORS 496.171 - 496.192, 497.298, 497.308, 498.002, 498.006 & 498.012

Hist.: DFW 12-2005, f. & cert. ef. 3-9-05; DFW 148-2005, f. & cert. ef. 12-29-05; DFW 144-2010, f. & cert. ef. 10-11-10

### 635-110-0010

#### Harassment and Take of Wolves during Phase I (Conservation)

**NOTE:** As of October 1, 2010, these rules are pre-empted by the endangered status of the gray wolf under the federal Endangered Species Act. Once federal protections are reduced to a level below that of Oregon law, these rules will govern harassment and take of wolves in Oregon.

(1) This rule describes the types of harassment and take of wolves allowed by persons outside ODFW (or ODFW or Wildlife Services acting as their agent) during Phase I — (Conservation: 0–4 breeding pairs) as called for in chapter III of the Oregon Wolf Conservation and Management Plan. Other chapters of the Plan authorize ODFW to take wolves for other specified wildlife management purposes. For OAR 635-110-0010, 635-110-0020 and 635-110-0030, "livestock" means horses, jackasses, cattle, llamas, alpacas, sheep, goats, swine, domesticated fowl, any fur-bearing animal bred and maintained (commercially or otherwise) within pens, cages and hutches, bison and working dogs. "Working dogs" means guarding dogs and herding dogs.

(2) Non-injurious harassment.

(a) Subject to the conditions specified in paragraph (c), the following persons may use non-injurious harassment against wolves without a permit:

(A) Livestock producers (or their agents) on land they own or lawfully occupy; or

(B) Grazing permittees legally using public land under valid livestock grazing allotments.

(b) Non-injurious harassment means scaring off a wolf (or wolves) without doing bodily harm, and includes (but is not limited to) firing shots in the air, making loud noises or otherwise confronting the wolf (or wolves).

(c) Non-injurious harassment is allowed without a permit under this rule only if:

(A) The wolf (or wolves) is in the act of testing or chasing livestock, is attempting to test or chase livestock or is in close proximity of livestock;

(B) The person encounters the wolf (or wolves) unintentionally (i.e., the person is not stalking or searching for wolves);

(C) The harassment in fact does not result in injury to the wolf (or wolves); and

(D) The harassment is reported to ODFW within 48 hours.

(d) Any non-injurious harassment that does not meet each requirement of this rule requires a permit in advance from ODFW.

(3) Non-lethal injurious harassment.

(a) Subject to the conditions specified in paragraph (c), in addition to state or state authorized agents, the following persons may use non-lethal injurious harassment against wolves by permit:

(A) Livestock producers (or their agents) on land they own or lawfully occupy;

(B) Grazing permittees legally using public land under valid livestock grazing allotments.

(b) Non-lethal injurious harassment means scaring off a wolf (or wolves) without killing but with some injury to the wolf. Wolves may be pursued (unintentional encounters are not required).

(c) Non-lethal injurious harassment is allowed by permit from ODFW only if:

(A) ODFW confirms wolf depredation on livestock or other wolf-livestock conflict in the area. "Other wolf-livestock conflict" means loitering near, testing, chasing, or otherwise disrupting livestock;

(B) The applicant confers with ODFW to determine the most effective harassment method;

(C) ODFW considers the location of known den sites;

(D) The harassment in fact does not result in the death of a wolf;

(E) No identified circumstance exists that attracts wolf/livestock conflict; and

(E) The harassment is reported to ODFW within 48 hours.

(d) Permits for non-lethal injurious harassment remain valid for the livestock grazing season in which issued, provided the livestock operator complies with all applicable laws, including permit conditions. The agency shall inform harassment permit holders of non-lethal methods for minimizing wolf-livestock conflict and provide assistance upon request. Receiving future lethal control permits is contingent upon documentation of efforts to use non-lethal methods.

(4) Relocation. ODFW will authorize relocation by state personnel when a wolf (or wolves) becomes inadvertently involved in a situation, or is present in an area, that could result in conflict with humans or harm to the wolf, provided that ODFW has no reason to believe that the wolf actually attacked or killed livestock or pets. The relocation will be

designed to prevent conflict with humans or reduce the possibility of harm to the wolf. The wolf (or wolves) would be relocated to suitable habitat at the direction of ODFW.

(5) Lethal take of wolves in the act of attacking livestock.

(a) Subject to the conditions specified in paragraph (c) and with a permit from ODFW, the following persons may use lethal force against wolves in the act of attacking livestock:

(A) Livestock producers (or their agents) on land they own or lawfully occupy; or

(B) Grazing permittees using public land.

(b) A wolf is "in the act of attacking livestock" if it is biting, wounding or killing livestock.

(c) Lethal force is allowed by permit from ODFW only if:

(A) ODFW confirms that wolves previously have wounded or killed livestock in the area and efforts to prevent or resolve the problem have been deemed ineffective;

(B) The wolf is seen in the act of attacking, not testing or scavenging;

(C) There is fresh evidence of the attack (e.g., visible wounds, tracks demonstrating a chase occurred);

(D) The wolf carcass is not removed or disturbed;

(E) The use of lethal force is reported to ODFW or Wildlife Services within 24 hours;

(F) No identified circumstance exists that attracts wolf/livestock conflict;

(G) ODFW confirms that the wound was caused by a wolf (or wolves): and

(H) Throughout the term of the permit, the permit holder implements non-lethal actions to minimize or avoid wolf-livestock conflict.

**NOTE:** The Oregon Wolf Conservation and Management Plan calls for allowing lethal take of wolves in this situation *without a permit on private land*. However, the Plan recognizes that because current statute requires a permit, implementing this portion of the Plan depends upon amendment of the statute by the legislature. Should the legislature make that statutory change, the Commission will amend this rule to allow for take without permit.

(6) Lethal take to deal with chronic depredation.

(a) ODFW may authorize its personnel, authorized agents, or Wildlife Services, to use lethal force on wolves at a property owner or permittee's request if:

(A) ODFW confirms either:

(i) Two confirmed depredations by wolves on livestock in the area; or

(ii) One confirmed depredation followed by three attempted depredations (testing or stalking) in the area;

(B) The requester documents unsuccessful attempts to solve the situation through non-lethal means;

(C) No identified circumstance exists that attracts wolf-livestock conflict; and

(D) The requester has complied with applicable laws and the conditions of any harassment or take permit.

(b) When authorized, lethal take under this paragraph will be taken only by ODFW, authorized ODFW agents, or Wildlife Services personnel.

(7) "Identified circumstance" means a condition which:

(a) ODFW determines, based upon its investigation of the situation, attracts wolves and fosters conflict between wolves and livestock; and

(b) ODFW advises the landowner, livestock producer or grazing permittee to remedy; but

(c) The landowner, livestock producer or grazing permittee fails to remedy.

(8) "In the area" means where ODFW has determined the presence of the depredating wolves.

Stat. Auth.: ORS 496.012, 496.138, 496.146 & 496.162

Stats. Implemented: ORS 496.171 - 496.192, 497.298, 497.308, 498.002, 498.006, 498.012 & 498.026

Hist.: DFW 12-2005, f. & cert. ef. 3-9-05; DFW 92-2010(Temp), f. & cert. ef. 6-29-10 thru 12-25-10; DFW 144-2010, f. & cert. ef. 10-11-10

#### **635-110-0020**

#### **Harassment and Take of Wolves During Phase II (Management)**

**NOTE:** as of October 1, 2010, these rules are pre-empted by the endangered status of the gray wolf under the federal Endangered Species Act. Once federal protections are reduced to a level below that of Oregon law, these rules will govern harassment and take of wolves in Oregon.

(1) This rule describes the types of harassment and take of wolves allowed by persons outside ODFW (or ODFW or Wildlife Services acting as their agent) during Phase II — (Management: 5-7 breeding pairs) as called for in chapter III of the Oregon Wolf Conservation and Management Plan. Other chapters of the Plan authorize ODFW to take wolves for other specified wildlife management purposes.

(2) Non-injurious harassment of wolves is allowed under the same conditions as in Phase I (OAR 635-110-0010(2)).

(3) Non-lethal injurious harassment.

(a) Non-lethal injurious harassment is allowed without a permit on private land by livestock producers or their agents on land they own or lawfully occupy. Livestock producers are encouraged to use non-injurious techniques first. There must be no identified circumstance that attracts wolf-livestock conflict, and the harassment must be reported to ODFW within 48 hours.

(b) Non-lethal injurious harassment is allowed by permit on public land by grazing permittees who are legally using public land under valid livestock grazing allotments and upon the following conditions:

(A) ODFW confirms wolf depredation on livestock or other wolf-livestock conflict in the area. "Other wolf-livestock conflict" means loitering near, testing, chasing, or otherwise disrupting livestock;

(B) ODFW considers the location of known wolf sites;

(C) There is no identified circumstance at the site which attracts wolf/livestock conflict; and

(D) The harassment is reported to ODFW within 48 hours.

(c) As to non-lethal injurious harassment on either private or public land, pursuing wolves is allowed.

(4) Relocation of wolves will be considered under the same circumstances as in Phase I (OAR 635-110-0010(4)).

(5) Lethal take of wolves in the act of attacking livestock is allowed under the same conditions as in Phase I (OAR 635-110-0010(5)).

**NOTE:** the Oregon Wolf Conservation and Management Plan calls for allowing lethal take of wolves in this situation *without a permit on private or public land*. However, the Plan recognizes that because current statute requires a permit, implementing this portion of the Plan depends upon amendment of the statute by the legislature. Should the legislature make that statutory change, the Commission will amend this rule to allow for take without permit.

(6) Lethal take of wolves to deal with chronic depredation.

(a) State employees or agents are authorized to use lethal force under the same conditions as in Phase I (635-110-0010(6)).

(b) Subject to the conditions specified in paragraph (c) and with a limited duration permit from ODFW, the following persons may use lethal force to deal with chronic depredation:

(A) Livestock producers (or their agents) on land they own or lawfully occupy; or

(B) Grazing permittees legally using public land.

(c) ODFW will issue a permit to use lethal force to deal with chronic depredation only if:

(A) ODFW confirms that the area has had at least two depredations by wolves on livestock;

(B) ODFW determines that wolves are routinely present on that property and present a significant risk to livestock;

(C) There is no identified circumstance at the site which attracts wolf/livestock conflict;

(D) The applicant is in compliance with applicable laws and the terms of any previous wolf permit;

(E) The applicant documents use of non-lethal methods; and

(F) Any wolf taken is considered property of the state and reported to ODFW within 48 hours.

Stat. Auth.: ORS 496.012, 496.138, 496.146 & 496.162

Stats. Implemented: ORS 496.171 - 496.192, 497.298, 497.308, 498.002, 498.006, 498.012 & 498.026

Hist.: DFW 12-2005, f. & cert. ef. 3-9-05; DFW 144-2010, f. & cert. ef. 10-11-10

### **635-110-0030**

#### **Harassment and Take of Wolves During Phase III**

**NOTE:** as of October 1, 2010, these rules are pre-empted by the endangered status of the gray wolf under the federal Endangered Species Act. Once federal protections are reduced to a level below that of Oregon law, these rules will govern harassment and take of wolves in Oregon.

(1) This rule describes the types of harassment and take of wolves allowed by persons outside ODFW (or ODFW or Wildlife Services acting as their agent) during Phase III (more than 7 packs) as called for in chapter III of the Oregon Wolf Conservation and Management Plan. Other chapters of the Plan authorize ODFW to take wolves for other specified wildlife management purposes.

(2) Non-injurious harassment of wolves is allowed under the same conditions as in Phase I (OAR 635-110-0010(2)).

(3) Non-lethal injurious harassment is allowed under the same conditions as in Phase II (OAR 635-110-0020(3)), except that wolf depredation on livestock or other wolf-livestock conflict may be confirmed by either ODFW or Wildlife Services.

(4) Relocation of wolves will be considered under the same circumstances as in Phase I (OAR 635-110-0010(4)).

(5) Lethal take of wolves in the act of attacking livestock is allowed under the same conditions as for Phase II (OAR 635-110-0020(5)), except that wolf depredation on livestock may be confirmed by either ODFW or Wildlife Services.

**NOTE:** the Oregon Wolf Conservation and Management Plan calls for allowing lethal take of wolves in this situation *without a permit on private or public land*. However, the Plan recognizes that because current statute requires a permit, implementing this portion of the Plan depends upon amendment of the statute by the legislature. Should the legislature make that statutory change, the Commission will amend this rule to allow for take without permit.

(6) Lethal take of wolves to deal with chronic depredation is allowed under the same conditions as for Phase II (OAR 635-110-0020(6)), except that wolf depredation on livestock may be confirmed by either ODFW or Wildlife Services.

(7) The Commission will authorize controlled take of wolves by special permit in specific areas where necessary to address chronic wolf-livestock conflicts or ungulate population declines. "Chronic" means two livestock depredations have been confirmed by ODFW or Wildlife Services, or one depredation followed by three attempted depredations (testing or stalking). The Commission may also choose to authorize such controlled take on private lands where the landowner is willing to provide access.

Stat. Auth.: ORS 496.012, 496.138, 496.146 & 496.162

Stats. Implemented: ORS 496.171 - 496.192, 497.298, 497.308, 498.002, 498.006, 498.012 & 498.026

Hist.: DFW 12-2005, f. & cert. ef. 3-9-05; DFW 144-2010, f. & cert. ef. 10-11-10

## 635-110-0040

### Incidental Take of Wolves

Any person may apply for a permit to authorize take of a gray wolf (or wolves) incidental to an otherwise lawful activity, as per OAR 635-100-0170. However, ORS 496.172(4) prohibits the Commission from issuing an incidental take permit for a species that is federally listed.

Stat. Auth.: ORS 496.012, 496.138, 496.146 & 496.162

Stats. Implemented: ORS 496.171 - 496.192, 497.298, 497.308, 498.002, 498.006, 498.012 & 498.026

Hist.: DFW 12-2005, f. & cert. ef. 3-9-05

The official copy of an Oregon Administrative Rule is contained in the Administrative Order filed at the Archives Division, 800 Summer St. NE, Salem, Oregon 97310. Any discrepancies with the published version are satisfied in favor of the Administrative Order. The Oregon Administrative Rules and the Oregon Bulletin are copyrighted by the Oregon Secretary of State. [Terms and Conditions of Use](#)

© 2012, Oregon Secretary of State. All Rights Reserved.

136 State Capitol, Salem, OR 97310

[Contact Us](#) | [Work With Us](#) | [Job Opportunities](#) | [Contract Opportunities](#) | [Text-Only Version](#) | [Graphic Version](#)

**Appendix B: Correspondence from Oregon Department of Fish and Wildlife and The  
Confederated Tribes of the Umatilla Indian Reservation**



Oregon

John A. Kitzhaber, MD, Governor

SEP 16 2011

Department of Fish and Wildlife

Wildlife Division
3406 Cherry Ave NE
Salem, OR 97303-4924
(503) 947-6300
Fax (503) 947-6330
www.dfw.state.or.us



September 15, 2011

Dave Williams
State Director
USDA - Wildlife Services
6135 NE 80th Ave, Suite A-8
Portland, OR 97218

Dear Mr. Williams:

Your July 1, 2011 letter asked for assistance in developing a National Environmental Policy Act Environmental Assessment (EA) analyzing Wildlife Services' potential participation in implementing the Oregon Wolf Conservation and Management Plan (OWCMP). Below are my responses to the questions posed in your letter:

- 1) I request ODFW's assistance in this effort by becoming a cooperating agency in the development of the EA.

ODFW requests cooperator status in developing an EA analyzing Wildlife Services' implementation of the OWCMP. We are particularly interested in your analysis of potential alternatives.

- 2) What wolf management actions, non-lethal and lethal, has ODFW carried out to implement the OWCMP?

Information on ODFW's implementation of the OWCMP can be found at http://www.dfw.state.or.us/Wolves/index.asp. The department is currently implementing all aspects of the management plan.

- 3) If Wildlife Service's decides not to participate in the implementation of the OWCMP would ODFW go forth with implementing non-lethal and lethal wolf management actions as called for in the OWCMP?

Yes.

- 4) Related to question #3; who would carry out those actions.

ODFW staff or our designated agent(s) will implement the OWCMP. Our ability to implement the OWCMP may be compromised if Wildlife Services was unable to assist.

Please let me know how we may be of further assistance.

Sincerely,

Ron Anglin (handwritten signature)

Ron Anglin
Wildlife Division Administrator



Oregon

John A. Kitzhaber, MD, Governor

Department of Fish and Wildlife

Wildlife Division  
3406 Cherry Ave NE  
Salem, OR 97303-4924  
(503) 947-6300  
Fax (503) 947-6330  
www.dfw.state.or.us

RECEIVED  
MAR 30 2012

BY: .....



March 28, 2012

Dave Williams  
Oregon State Director, USDA - APHIS  
6135 NE 80<sup>th</sup> Ave  
Suite A-8  
Portland, OR 97218

Mr. Williams:

We are responding to your recent request for clarification over our concerns about implementing the Oregon Wolf Conservation and Management Plan if Wildlife Services is unable to assist us in any way. The impacts will be felt by ODFW in several ways.

1. Though wolves targeted for lethal control may be taken by ODFW in a similar fashion, ODFW would be required to redirect personnel and funding resources to conduct lethal control actions.
2. Depending on demand for personnel resources in other areas or situations (wolf related or otherwise), ODFW's service level to landowners may be reduced or delayed.
3. Any delay in ODFW lethal control efforts, for any reason, may have the effect of increasing wolf depredation of livestock.
4. Funding necessary to conduct un-planned lethal control will be diverted from other wolf management sources. This would have the effect of reducing other wolf related management efforts (i.e., non-lethal control supplies, wolf damage management of other packs, implementation of capture and monitoring programs). Reduction in these other programs will have a direct impact on actions necessary to ensure recovery of wolves in Oregon.
5. If Wildlife Services does not have the ability to take wolves, this will impact their ability to conduct capture (i.e., trapping) for the purpose of depredation management.
6. If Wildlife Services does not have the ability to take wolves, this will impact their ability to assist the ODFW in trapping wolves for research and monitoring purposes needed to assess population viability and health.

22

**Confederated Tribes**  
*of the*  
**Umatilla Indian Reservation**  
DNR Wildlife Program



46411 Limine Way  
Pendleton, OR 97801

www.ctuir.org email: info@ctuir.org  
Phone 541-276-3447

April 27, 2012

Dave Williams  
Oregon State Director, USDA-APHIS  
6135 NE 80<sup>th</sup> Ave  
Portland, OR 97218

Dear Mr Williams:

I am writing in response to your recent inquiry regarding wolf management and implementation of control measures on the Umatilla Indian Reservation if Wildlife Services is unable to assist. The Confederated Tribes of the Umatilla Indian Reservation (CTUIR) would implement the response plan for wolf conflicts with or without the assistance of Wildlife Services. However, the lack of assistance from Wildlife Services would significantly impact the CTUIR's ability to fund other important wildlife and habitat management actions.

The absence of assistance would impact the CTUIR Wildlife Program's ability to provide services to the Tribal public for both wolf and non-wolf related management response. Wolf-related response could be reduced or delayed and non-lethal control supplies and management efforts necessary for the conservation and recovery of wolves could be deemphasized. The CTUIR relies on the technical expertise and equipment of Wildlife Services for current predator control needs and hopes to do so for wolf control actions as well.

Please feel free to contact me if you have any further questions.

Sincerely,

Carl A. Scheeler  
Wildlife Program Manager, DNR

## **Appendix C: USFWS consultation on lynx**



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

La Grande Fish and Wildlife Office

3502 Highway 30

La Grande, Oregon 97850

Phone: (541) 962-8584 FAX: (541) 962-8581

Reply To: 8330.I0060 (12)  
File Name: Wildlife-Services-Wolf Damage Management-LOC.doc  
TS Number: 12-394  
TAILS: 01EOFW00-2012-I-0060  
Doc Type: Final

FEB 29 2012

Dave Williams, State Director  
Oregon State Office  
USDA-APHIS Wildlife Services  
6135 NE 80<sup>th</sup> Ave, Suite A-8  
Portland, OR 97218

Subject: Informal consultation on Wildlife Services' proposed wolf damage management program in eastern Oregon (*FWS reference* 01EOFW00-2012-I-0060)

Dear Mr. Williams:

This document transmits the Fish and Wildlife Service's (Service) concurrence that the U.S. Department of Agriculture - Animal and Plant Health Inspection Service - Wildlife Services' (Wildlife Services) proposed wolf damage management program for the portion of eastern Oregon where gray wolves are currently delisted, *may affect, but is not likely to adversely affect* the federally threatened Canada lynx (*Felis canadensis*). This document was prepared in accordance with section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Wildlife Service's request for consultation and accompanying Biological Assessment (Assessment), dated January 24, 2012, were received on January 27, 2012.

Based on the information provided in the Assessment, Wildlife Services has determined, and the Service concurs, that the proposed wolf damage management program activities may affect, but are not likely to adversely affect Canada lynx. A description of the proposed action and our rationale for concurrence with the effects determination is provided below.

### Description of the Proposed Action

Wildlife Service's proposed action is to assist the Oregon Department of Fish and Wildlife (ODFW) with management of confirmed and chronic wolf depredation on livestock and to a lesser extent, on working dogs (e.g., livestock herding and guarding dogs) in the eastern portion of the State. Although less likely, the potential for wolves to threaten human safety will also be addressed, if necessary. ODFW's 2010 Wolf Conservation and Management Plan ([http://www.dfw.state.or.us/Wolves/management\\_plan.asp](http://www.dfw.state.or.us/Wolves/management_plan.asp)) details depredation criteria and actions that would be taken to target individual problem wolves for removal. Only the State of

Oregon can issue an order to remove wolves. Most program actions, such as wolf damage identification, non-lethal education and technical assistance, and monitoring, would be *inconsequential to lynx*. However, *lethal and nonlethal methods used to capture wolves (either for removal or for the purposes of fitting with tracking collars)*, may also potentially affect Canada lynx if those tools are used in occupied lynx habitat. These tools include aerial and ground shooting, foot and neck snares and foot-hold traps.

The proposed program would occur within a boundary in eastern Oregon where gray wolves (*Canis lupus*) which are part of the Northern Rocky Mountain Distinct Population Segment (NRM DPS) are no longer listed under the federal ESA and where they are managed by the State of Oregon under ORS 496.171-192. This geographic boundary is described in the Service's final rule (USFWS 2009a), which established the NRM DPS of gray wolves, and is defined as *that portion of Eastern Oregon, east of the centerline of Highway 395 and Highway 78 north of Burns Junction and that portion of Oregon east of the centerline of Highway 95 south of Burns Junction*.

APHIS-WS reviews planned work activities with land management agencies in its annual work planning process. Therefore, any work that may occur in potential lynx habitat will be identified. APHIS-WS activities only overlap with identified lynx habitat on portions of these forests where cattle grazing and chronic, confirmed, wolf conflicts may occur.

A program review of effects on Canada lynx (APHIS-WS Management Information System in USDA 2000) showed that only one lynx had been captured since 1971 from all APHIS-WS program activities on all land classes in the western United States. The lynx was captured in a foot-hold trap outside of lynx habitat in Idaho in 1991. That animal was released alive. Oregon records since that time show no lynx captures (APHIS-WS Management Information System).

Wolf removal actions by Wildlife Services are expected to occur at a low level. Wolf damage management activities in eastern Oregon will occur in very limited and isolated geographic locations. Given the expertise of Wildlife Services, the proven skill of its staff in capturing target species, and the selectivity of the methods, the potential risk to Canada lynx is very low. Aerial and ground shooting is virtually 100 percent selective for target species because the target animal or animals are observed and verified as target species by trained and experienced personnel prior to shooting. Traps and snares may potentially capture lynx. However, the potential to capture smaller animals such as lynx in foot-hold traps or foot snares would be reduced by using pan-tension devices set at a high enough triggering tension to prevent it from triggering the trap or foot snare. Canada lynx are smaller than wolves and therefore not likely to enter neck snares set for wolves.

Given the extremely low incidence of confirmed lynx observations in Oregon, the Wildlife Services' history of not capturing a lynx, and the selectivity of the methods, Wildlife Services considers it extremely unlikely that its wolf damage management program in eastern Oregon would result in the capture of a lynx. However, Wildlife Services will use the following procedures to minimize the potential to capture Canada lynx.

Wildlife Services specialists that may work in potential lynx habitat are familiar with lynx identification and sign, and with Service recommendations for avoidance of incidental capture of

lynx (USFWS 2003a). If lynx sign is observed by Wildlife Services employees, they will adhere to the following measures to reduce the potential of capturing a lynx:

1. The Service's local field office and the appropriate land management agency shall be notified as soon as possible of the finding of any dead or injured Canada lynx. Cause of death, injury, or illness, if known, also shall be conveyed to those offices.
2. Wildlife Services would only utilize foot-hold traps and foot snares set for wolves that are equipped with pan-tension device sufficient to reduce the likelihood of capturing Canada lynx up to 35 pounds (e.g., 8 to 10 pound trip weight) in potential lynx habitat.
3. Lynx often avoid traps placed in open fields; therefore, to the extent that this is practical and effective, traps will be set in open fields.
4. Wildlife Services is cautious with bait selection for targeting wolves to avoid attracting lynx. For example, the use of tainted rather than fresh meat baits can be used under some circumstances for wolves to avoid attracting lynx.
5. In the unlikely event that neck snares would be used to capture wolves, there would be little risk to lynx since the cable loop size is large enough (greater than 12 inches) to preclude capture of lynx.

### **Canada Lynx**

The Canada lynx was listed as a threatened species in the contiguous United States in March of 2000 (USFWS 2000). A revised designation of critical habitat was published in February 2009 (USFWS 2009b). No critical habitat for Canada lynx was designated in Oregon.

The lynx is a medium-sized cat with long legs; large, well-furred paws; long tufts on the ears; and a short, black-tipped tail (McCord and Cardoza 1982). The winter pelage of the lynx is dense and has a grizzled appearance with grayish-brown mixed with buff or pale brown fur on the back, and grayish-white or buff-white fur on the belly, legs and feet. Summer pelage of the lynx is more reddish to gray-brown (Koehler and Aubry 1994). Adult males average 22 pounds (lbs) in weight and females average 19 lbs (Quinn and Parker 1987). The lynx's long legs and large feet make it highly adapted for hunting in deep snow. Snowshoe hares (*Lepus americanus*) are the primary prey of lynx, comprising 35-97 percent of the diet (Koehler and Aubry 1994).

Lynx populations in the contiguous United States occur at the southern periphery of the species' range, whose core is located in the northern boreal forest of central Canada (McCord and Cardoza 1982). In Canada and Alaska, lynx inhabit the boreal forest ecosystem known as the taiga (Agee 2000). In the western United States, the range of lynx extends south from the classic boreal forest zone into subalpine conifer forests (Agee 2000). Within these forest types, lynx are most likely to persist in areas that receive deep snow, to which the lynx is highly adapted (Ruggiero *et al.* 2000).

Forests with boreal features extend into the northwestern United States at high elevations in the Cascade and Rocky Mountain Ranges. However, these forest patches are small relative to the extensive northern boreal forest of Canada. Most southern boreal forest habitat patches in

Oregon and southern Washington are considered too small to consistently support the prey base of snowshoe hares necessary to support resident populations of lynx (Ruggiero *et al.* 2000).

In the northwestern United States, museum specimens document historic occurrences of lynx in the higher mountains of Washington, Oregon, Montana, and Idaho (McKelvey *et al.* 2000). However, the historic distribution of resident, breeding populations is unknown. Today, resident lynx populations are known to exist in high-elevation conifer forests of western Montana and north-central and northeastern Washington (Ruggiero *et al.* 2000). Resident lynx populations probably also exist in contiguous habitats in northern Idaho.

In Oregon, there is no evidence that a resident lynx population ever occurred in Oregon (USFWS 2003b). Unconfirmed sighting reports of lynx have been received, but in the last 50 years only three specimens have been documented in the State, and all were collected in areas not considered to be lynx habitat: one in bunchgrass-rimrock habitat in Wallowa County in 1964, one in a suburban residential area near Corvallis in Benton County in 1974 (Verts and Carraway 1998), and a third in Harney County in southeastern Oregon in 1993 (McKelvey *et al.* 2000). Given the naturally insular habitat in Oregon and the great distance from core populations in Canada, it is possible that lynx have always occurred intermittently in this State as occasional dispersers from the north that have been unable to establish persistent populations. At the present time, there is no known resident population in Oregon, nor is one expected to develop in the foreseeable future given the distance (over 150 miles) from the nearest existing lynx populations in northern Washington/western Montana and the limited extent of suitable habitat.

## **Conclusion**

Given what we know about the status of lynx in Oregon and surrounding areas, Wildlife Services' wolf damage management activities in this portion of eastern Oregon are extremely unlikely to affect lynx. The best available information indicates there is no resident lynx population in this State. Individual lynx do occasionally disperse into Oregon; however, given their extreme rarity it is highly unlikely that a dispersing lynx will encounter a snare or trap set for wolves, especially given that wolf control work will be very limited in the high-elevation habitats preferred by lynx. In addition, the previously identified precautionary measures being taken by Wildlife Services should further reduce the possibility of lynx being affected by the proposed activities.

Based on the above information, the Service concurs with Wildlife Services' determination that the proposed wolf damage management program activities, within the Oregon portion of the delisted gray wolf NRM DPS, may affect, but are not likely to adversely affect, Canada lynx.

This concludes informal consultation pursuant to section 7(a)(2) and 7(c) of the ESA. If new information reveals effects of the action may affect listed species in a manner or to an extent not considered in this consultation; the action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in this consultation; and/or, a new species is listed or critical habitat is designated that may be affected by this action, Wildlife Services would need to reinitiate consultation.

We appreciate your efforts to minimize effects to listed species. Wildlife Services is encouraged to continue to explore opportunities to promote the conservation of listed species. If you have questions regarding this concurrence, please contact me at 541-962-8509.

Sincerely,

A handwritten signature in black ink that reads "Gary S. Miller". The signature is written in a cursive style with a large, stylized initial "G".

Gary S. Miller  
Field Supervisor

cc:

Bruce Eddy, Oregon Department of Fish and Wildlife, La Grande, Oregon  
Rollie White, Oregon Fish and Wildlife Office, Portland, Oregon

**LITERATURE CITED**

- Agee, J.K. 2000. Disturbance ecology of North American boreal forests and associated northern mixed/subalpine forests. In Ruggiero, L.F., K.B. Aubry, S.W. Buskirk, et al., tech. eds. The scientific basis for lynx conservation in the contiguous United States. Gen. Tech. Rpt. RMRS-GTR-30. Ogden, UT: U.S. Dept. Agriculture, Forest Service, Rocky Mountain Research Station.
- Koehler, G.M., and K.B. Aubry. 1994. Pages 74-98 in L.F. Ruggiero et al., tech. eds. The scientific basis for conserving forest carnivores: American marten, fisher, lynx, and wolverine in the western United States. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station. General Technical Report RM-254. 184 pp.
- McCord, C.M., and J.E. Cardoza. 1982. Bobcat (*Felis rufus*) and lynx (*F. lynx*). Pages 728-766 in J.A. Chapman and G.A. Feldhamer, eds. Wild mammals of North America. Johns Hopkins University Press, Baltimore, Maryland.
- McKelvey, K.S., K.B. Aubry, and Y.K. Ortega. 2000. History and distribution of lynx in the contiguous United States. Chapter 8 in L.F. Ruggiero, K.B. Aubry, S.W. Buskirk, et al., tech. eds. Ecology and Conservation of Lynx in the United States. General Technical Report RMRS-GTR-30WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.
- ODFW (Oregon Department of Fish and Wildlife). 2010. Oregon Wolf Conservation and Management Plan – December 2005; updated 2010. ([http://www.dfw.state.or.us/Wolves/docs/Oregon\\_Wolf\\_Conservation\\_and\\_Management\\_Plan\\_2010.pdf](http://www.dfw.state.or.us/Wolves/docs/Oregon_Wolf_Conservation_and_Management_Plan_2010.pdf)). Oregon Department of Fish and Wildlife, Salem, OR. 105 pp.
- Quinn, N.W.S., and G. Parker. 1987. Lynx. Pages 683-694 in M. Novak, J. Baker, M. Obbard, eds. Wild furbearer management and conservation in North America. Ontario Ministry of Natural Resources, Toronto.
- Ruggiero, L.F., K.B. Aubrey, S.W. Buskirk, et al. 2000. Tech. eds., Ecology and Conservation of Lynx in the United States. General Technical Report RMRS-GTR-30WWW. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. As Published by University Press of Colorado, Boulder. 480 pp.
- USFWS (U.S. Fish and Wildlife Service). 2009a. Endangered and Threatened Wildlife and Plants; Final Rule to Identify the Northern Rocky Mountain Population of Gray Wolf as a Distinct Population Segment and to Revise the List of Endangered and Threatened Wildlife. Federal Register 74(62): 15123-15188.
- USFWS (U.S. Fish and Wildlife Service). 2009b. Final Rule: Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Contiguous United States Distinct Population Segment of the Canada Lynx. Federal Register 74(36): 8616-8702.

USFWS (U.S. Fish and Wildlife Service). 2003a. How To Avoid Incidental Take of Lynx While Trapping or Hunting Bobcats and Other Furbearers. (<http://www.fws.gov/midwest/endangered/mammals/lynx/pdf/lynx-take-bro.pdf>). September 2003. 20 pp.

USFWS (U.S. Fish and Wildlife Service). 2003b. Final Rule: Endangered and Threatened Wildlife and Plants; Notice of Remanded Determination of Status for the Contiguous United States Distinct Population Segment of the Canada Lynx; Clarification of Findings. Federal Register 68(128): 40076-40101.

USFWS (U.S. Fish and Wildlife Service). 2000. Determination of threatened status for the contiguous U. S. Distinct population segment of the Canada lynx and related rule. Federal Register 65(58): 16052-16086.

Verts, B.J. and L.N. Carraway. 1998. Land Mammals of Oregon. Univ. of California Press.

